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Implementing a Checklist & Hourly Huddles to Increase Situational Awareness During the
Second Stage of Labor-A Perinatal Quality Improvement Project

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NURS 958

Summer 2015

ABSTRACT

Background: Current management of the second stage of labor often follows tradition-based routines rather than evidence-based practices. A lack of situational awareness and tunnel vision can limit medical decision-making. Northern New England Perinatal Quality Improvement Network (NNEPQIN) has listed Second Stage Situational Awareness as a priority initiative. Standardized checklists are useful for maintaining situational awareness. Regular debriefings using a standardized tool have been shown to improve communication and team based care, which generally leads to improved patient outcomes. Based on this evidence, developing a standardized checklist including regular hourly care team “huddles” is valuable and could result in improved birth outcomes.

AIM Statement: The global aim of this project was to reduce variability in practice during the second stage of labor to improve neonatal birth outcomes. The specific aim was to implement a second stage situational awareness checklist with a completion percentage of 80% by July 2015.

Method: The theoretical framework guiding this project was Endsley’s theory of Situation Awareness. Pre-implementation chart reviews were conducted to determine what information was currently being documented during the second stage. A 9-item checklist was developed based on hospital preference for use during hourly huddles once second stage was reached. Staff were educated on checklist use pre-implementation. Post-implementation chart reviews were conducted to determine checklist completion percentage.

Results: Chart reviews demonstrated an average checklist completion percentage of 43% over the two-week implementation period with a range of 22-89%. Huddles were conducted and documented in 33% of the reviewed delivery charts.

Conclusions: Continued follow up and work re-design is needed to consistently incorporate the checklist and huddles into practice.

Implications for the CNL: Implications for the CNL include continuing staff education to increase awareness and acceptance of the practice change, and examining project effects on perinatal outcomes including delivery mode and neonatal Apgar scoring.

Key words: *labor stage, second, situational awareness, standardized checklist, huddles, quality improvement*

Introduction

Background

The course of labor is divided into three stages. The first stage occurs at the onset of regular painful contractions associated with descent of the presenting part and the progressive dilation of the cervix until complete dilation. The second stage of labor begins upon full dilation of the cervix and continues up until the delivery of the fetus. At the beginning of the second stage, the presenting part of the fetus may or may not be fully engaged, and the woman may or may not have the urge to push. The third stage of labor begins after delivery of the baby and continues until the delivery of the placenta (FIGO Safe Motherhood and Newborn (SMNH) Committee, 2012). There are numerous guidelines available to aid providers during the first stage of labor, however, there are few guidelines for practice during the second stage of labor, which is often the most stressful part of the childbearing process for the woman and the fetus, and in turn the providers.

Current management of the second stage of labor often follows tradition-based routines rather than evidence-based practices. Provider opinion often leads practice and the lack of consistent high-quality evidence creates challenges when making decisions during this stage. Practice decisions during the second stage can effect both maternal and fetal outcomes. Significant potential complications may arise during the second stage including fetal hypoxia and acidemia which can lead to birth asphyxia, failure to descend leading to stalled labor, and worsening or new manifestations of maternal hypertension leading to eclampsia (FIGO Safe Motherhood and Newborn (SMNH) Committee, 2012).

There is minimal research available on the optimal management of the second stage of labor. Current practices include fetal heart rate (FHR) monitoring to determine the well-being of the fetus, various positions to optimize fetal descent, and recently evidence has supported the use of “laboring down” or delaying pushing in low-risk individuals to allow for the passive descent of the fetus (Brancato, Church, & Stone, 2008). The second stage of labor can be complicated by prolonged pushing, arrest of second stage of labor, and difficulties of fetal heart rate monitoring.

A challenging part of the second stage of labor is analyzing the FHR monitoring strip. Interpretation of FHR during the second stage of labor can be more difficult than during the first stage and remains one of the most problematic issues in obstetrics. Algorithms have been established by the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) that created uniform terminology in which any fetal heart rate pattern is classified as category I, II, or III based on the presence or absence of well-defined aspects of the FHR (Clark, et al., 2013). Category I tracings must display a baseline heart rate of 110-160 with moderate variability, and no late or variable decelerations. The tracing may have early decelerations, and accelerations are not required. Category II tracings are defined as not Category I or Category III. Category III tracings display absent variability and either recurrent late or variable decelerations or bradycardia, sinusoidal pattern (Northern New England Perinatal Quality Improvement Network, 2015). Recommendations have been developed by The American College of Obstetricians and Gynecologists for the management of Category I and III fetal heart rate tracings, but management of Category II tracings remains the most important and challenging issue in fetal heart rate monitoring (Clark, et al., 2013).

During the second stage of labor, it can be challenging to distinguish maternal from fetal heart rates and there are numerous case reports of intrapartum demise occurring in the presence of what providers thought was a reassuring fetal heart rate. In retrospect, the maternal heart rate was being monitored instead of the fetal heart rate (Northern New England Perinatal Quality Improvement Network, 2015). These errors can occur because providers are only observing the monitoring strip at brief moments in time and fail to step back and look at the whole picture.

Second stage management is a time when there is continuous presence of the nurse and possibly the obstetrician. Fetal monitoring occurs on a continuous basis, usually by external or internal monitoring devices. There is a progression of labor by either laboring down and allowing the fetus to descend naturally or active pushing efforts by the mother. The continuous presence of the nurse in the delivery room presents a number of barriers to second stage management. Nurses and providers may experience tunnel vision. This occurs when one is only looking at the situation directly in front of them, blocking everything else out, resulting in loss of the “big picture”. Nurses and providers often feel like they are working in silos. They are solely focused on the one patient and are unable to think about anything else. The continuous presence of the nurse or provider results in time distortion. Minutes can quickly turn to hours, with situations quickly changing as time progresses. Communication during this stage is key. It is important to continue to communicate with other staff and the patient about the ongoing changes. The final barrier is documentation. It is tedious and time consuming. Nurses are trying to focus their energy and time on the patient but must continue to document everything that is occurring during that stage (Baker, 2015).

Definition of Local Problem

Northern New England Perinatal Quality Improvement Network (NNEPQIN) is a group of hospitals throughout New England focusing on Quality Improvement. This organization is a collaboration between member hospitals created by the Division of Reproductive Health at the Centers for Disease Control and Prevention. It is a collaboration of state-based perinatal quality collaboratives (PQCs) working together to improve pregnancy outcomes for women and newborns through continuous quality improvement. Members are primarily hospitals. The network demonstrates how partnerships can act to translate evidence-based science to clinical care (Henderson, Suchdev, Abe, Osteen Johnston, & Callaghan, 2014).

Recently, a member hospital experienced a sentinel event where a laboring woman was pushing during the second stage and the fetal heart rate was temporarily lost on the monitor. After numerous position changes and attempts to find the fetal heart rate, the fetal heart rate was found again and the woman resumed pushing. Upon delivery, the fetus was unexpectedly stillborn. After reviewing the full fetal heart rate tracing, it was determined that the fetus suffered a demise when the heart rate was initially lost, and the tracing that was found after that time was actually the maternal heart rate. Review of the tracing showed a slow, steady increase in the fetal heart rate prior to losing it on the monitor. When the heart rate was found again, it was significantly lower. It was assumed to be the fetal heart rate and labor continued. No one expected a fetal demise, but unfortunately that was the outcome. This tragedy may have been avoidable with proper discussion and management of the second stage of labor.

Taking time to step back and view the big picture by utilizing checklists and huddles can help to reduce variation in practice resulting in improved outcomes.

Intended Improvement

The second stage of labor is a time when the loss of situational awareness and tunnel vision can limit medical decision making. Providers and nurses can be spending hours in the room providing one to one care for the laboring woman. It is easy to lose track of time and to feel “alone on an island”. The use of a standardized checklist can be a useful tool for maintaining situational awareness. Regular debriefings, or huddles, using a standardized tool have been shown to improve communication and team based care, which generally lead to improved patient outcomes in other areas of medicine. Obstetrics already has standardized management for other areas, such as oxytocin use, which has been shown to improve outcomes. There is ample evidence that using checklists and standardized care process along with teamwork help to create high reliability systems and generally improves patient care and outcomes (Northern New England Perinatal Quality Improvement Network, 2015). Based on this evidence, developing a standardized checklist that includes regular debriefings of the care team during the second stage of labor is valuable and could result in improved birth outcomes.

Global Aim

The theme for improvement with this initiative is improving neonatal birth outcomes. The global aim of the project is to reduce variability in practice during the second stage of labor to improve neonatal birth outcomes. The process begins with women entering the second stage of labor, and ends with successful delivery of the baby.

Specific Aim

The specific aim of the proposed intervention is to implement hourly huddles with a second stage situational awareness checklist with a completion percentage of 80% by July 2015. By working on this project it is expected that variability in management techniques will be reduced, and communication and awareness during the second stage of labor will be increased. It is imperative to begin this improvement project because NNEPQIN has listed this as a priority initiative following a sentinel event at a member hospital.

Methods

Ethical Issues

There are no identified ethical issues with the proposed quality improvement project. The project does not involve utilizing any identifying information and has no effect on physical well-being of participants. Ethical concerns were discussed with the director of the unit and no concerns were identified.

Theoretical Framework

Endsley's (1995) theory of situation awareness was developed to tackle problems faced by human factor practitioners that must deal with physical and perceptual tasks in dynamic systems. Dynamic systems are those which evolve with time, and are characterized by constant change. Her theory proposes that the operator's situation awareness (SA) is "a crucial construct on which decision making and performance in such systems hinge" (Endsley, 1995, p. 32). Situational Awareness theory has a long history and can be traced as far back as World War I

when it was used by military aircraft crews. The theory of situation awareness can be utilized in many other activities and circumstances, and can be applied in a wide variety of settings. While situational awareness has been difficult to define, a basic explanation is this: "SA is the cognitive state of being aware of what is happening around oneself and understanding how evolving events could affect one's goals and objectives; it is the ability to maintain "the big picture" and think ahead" (Edozien, 2015, p. 65). Endsley (1995) describes three levels of situational awareness: Level 1-perception of the environment, Level 2-comprehension of what this means, and Level 3-projection into the future. Level 1 is the first step in achieving SA and includes perceiving the status, attributes, and dynamics of the environment. Level 2 moves beyond simply being aware of the elements to an understanding of them. By using the Level 1 elements, the individual forms a holistic picture of the environment, understanding the significance of objects and events. Level 3 is the third and highest form of SA. This level involves using information and elements from level 1 & 2 to project future actions, and is achieved through knowledge of the status of changing aspects of the elements and understanding of the situation (Endsley, 1995).

SA incorporates the perception of relevant elements, comprehension of the meaning of these elements in combination with an in relation to operator goals, and a projection of future states of the environment based on this understanding. Using this strategy, individuals with proper SA will have a greater likelihood of making appropriate decisions and performing well in dynamic systems (Endsley, 1995).

Gaba, Howard, and Small (1995) examined how situation awareness can be applied to medical decision making. Concepts of situation awareness arise in other fields, including

anesthesiology. This particular branch of medicine shares many characteristics with aviation including dynamism, complexity, high information load, variable workload, and risk. As in aviation, human factors, rather than mechanical failures, are the cause of most preventable accidents. This makes the study of human performance promising step toward improving patient safety (Gaba, Howard, & Small, 1995).

The same concepts and ideas from anesthesiology practice can also be said for obstetrics. The delivery suite is a high-risk environment where transitions from low-risk to high-risk can occur quickly, and sentinel events can occur without any warning (Edozien, 2015). Situational awareness is a skill that is essential for safe practice in the delivery room. When SA is absent, there is poor decision making and accidents may occur. Many factors affect SA including stress, fatigue (both mental and physical), task saturation, work overload, inattention, distractions, interruptions, poor communication, and automaticity (Endsley, 1995). These elements are all commonplace on maternity units.

Applying Situational Awareness to the delivery room is a proactive way to manage information and unfolding events and anticipate problems. One way to attain this is with structured communication that reports assessments. Checklists are a simple way to increase SA and require minimal financial resources to do so. Checklists have an advantage over other methods of maintaining SA in that data is presented in a way that enables level 2 and level 3 awareness. They also help to reduce cognitive overload, therefore facilitating SA. One major disadvantage of checklists is automaticity which could occur during completion of the checklist resulting in false reassurance, or worse, an actual incident (Edozien, 2015). This project utilizes

the checklist as a way to increase situational awareness in the delivery room during the second stage of labor.

Setting

The proposed project has been initially discussed at OB section meetings that have included staff nurses, providers, clinical leaders, and the unit director. It is important to include the staff that will be involved in the change during the planning and developing of the intervention. This utilizes Lewin's change theory to "unfreeze" current practice. Meeting where there is open discussion of relevant issues develops awareness of the problem. The moving stage begins when the problem is clearly identified and goals and objectives are developed. This is the working stage where new attitudes and behaviors are promoted. The refreezing stage occurs once the change is incorporated into the work environment and its processes (Finkelman, 2012).

Planning the Intervention

The basis for this quality improvement project was determined after conducting a 5P assessment of the clinical unit. The 5P assessment provides a unique look at the microsystem by focusing on new aspects of the system, new questions, and new options for improvement (Center for Health-System Pharmacy Leadership, 2012).

A microsystem may have a mission statement, but its purpose may go beyond that statement and reflect the culture, values, attitudes, beliefs, and aspirations of the people who comprise the microsystem. The 5P assessment allows for each members view of the microsystem and its purpose, allowing for more purposeful priorities and decision making

(Center for Health-System Pharmacy Leadership, 2012). The purpose of the Family Center is to provide excellent care to pregnant women on the seacoast. The mission of the hospital is to improve the health of the community with common values of teamwork, individual respect, and a commitment to superior customer satisfaction (Exeter Health Resources, 2015).

Looking more closely at the patient population of a unit can give valuable insight into improved decision making and the design of care and services. It also gives insight into how to continually improve the care offered to the patient population (Center for Health-System Pharmacy Leadership, 2012). The patient population on this unit consists of pregnant women, newborns, and pediatrics. The unit has 15 LDRP rooms and 5 pediatric rooms. The majority of patients are seen for outpatient procedures, labor, and postpartum care. Pediatric patients can be admitted for multiple reasons, but the most common is respiratory illness. The usual length of stay is 48 hours for vaginal delivery and 72 hours for cesarean delivery.

It is important to identify all the professionals in the microsystem. Understanding what they do, the hours they work, their opinion of the work environment, what they know and want to learn, and what they want to contribute to the microsystem identifies opportunities for future improvement, awareness of staff satisfaction, and directions for individual development (Center for Health-System Pharmacy Leadership, 2012). Staff on the unit consists of registered nurses, obstetricians, midwives, pediatricians, OB technicians, clinical leaders, unit coordinators, and the unit director. Daily staff consists of 5-6 nurses, 1 OB technician, 1 unit coordinator, 1 clinical leader, the director, and 1 on call pediatrician, midwife, and obstetrician.

Many processes occur in a microsystem. Many times, professionals do not take the time to learn the different processes and their interrelationships. A lack of shared knowledge about the processes can create waste, reduces the reliability of care, and increases risk. Examining these processes can be useful for considering opportunities to redesign process (Center for Health-System Pharmacy Leadership, 2012). There are an abundance of processes that occur on this unit. There are no LNA's, so nurses are responsible for all direct patient care including assessments, assistance with ADLs, and vital signs. Nurses also conduct admissions and discharge teachings. There is daily rounding from the midwives, obstetricians, and pediatricians. Shift begins with team meeting to review all patients currently on the unit, then individual shift report is done face to face with the off-going nurse.

Patterns exists in every microsystem, but they are sometimes so commonplace, they are overlooked. It is important to identify and analyze patterns before determining improvement opportunities (Center for Health-System Pharmacy Leadership, 2012). The unit is a locked unit, and most staff are on unit at all times, expect for lunches. Communication is usually face to face, but each staff member carries a phone so they are reachable at all times. The unit contains white boards to identify who is on call and maintains a computer listing of all patients and their status that is visible to all staff. Overall, the Family Center is a complex unit that has numerous patterns and processes in place that allow it to function successfully each day.

This quality improvement project takes into account the information from the 5 P assessment and includes implementing a checklist for improving communication and awareness during the second stage of labor as a new process for the Unit. The checklist includes

information that should be communicated from nurse to provider in hourly huddles (See Appendix A). This information includes:

- current maternal status (risk factors, vitals, ability to push related to anesthesia, exhaustion)
- fetal status (current heart rate, position, labor tolerance)
- expected plan of care for next hour
- conditions that would prompt sooner review.

Upon arrival to the unit in labor, the patient is informed that periodic team meetings are routinely held during labor as part of communication. These huddles are held outside the patient room, but assessment and plan are shared with the patient and family immediately after, and then documented in the patient chart. The personnel involved in the hourly huddle will include, primary obstetrician, labor nurse, Charge nurse or designated labor RN who is not directly involved in the care of the patient. The PCP must be present at the huddle when there is a Category II fetal heart tracing, one-hour of active pushing without progress, or if requested by the primary RN. Documentation on the checklist will include:

- the names of staff present at the huddle
- complete dilation time including station and position of fetus
- whether the patient is actively pushing or not and the quality of pushing
- contraction frequency and quality
- maternal vital signs
- FHR baseline including variability, accelerations or decelerations

- plan of care
- time of the next huddle
- patient and family updated.

This intervention was chosen based on previous evidence regarding improved outcomes associated with checklists and standardized care processes. According to the World Health Organization, the purpose of a checklist is to detect a potential error before it happens. Checklists allow complex care pathways to function with high reliability by giving users the opportunity to pause and take stock of their actions before proceeding to the next step. Checklists have improved reliability of care (World Health Organization, 2015). Implementing the intervention will consist of providing the primary nurse with the checklist to utilize once the patient has reached the second stage of labor. The primary nurse will complete the checklist as labor progresses through the second stage, completing hourly huddles, filling in the checklist, and documenting in the patient electronic chart that the checklist was completed.

Staff education was completed prior to implementation. A PowerPoint presentation which included background information and details of the project and checklist was emailed to all staff that provide direct care to laboring patients. Small staff education sessions were completed, and staff nurses were signed off on a checklist once the materials were reviewed. Education sessions were held at different times during both the day and night shift to ensure all staff were included. A binder containing the PowerPoint presentation was located centrally at the nurse's station for review. Laminated copies of the checklist were available at the nurse's station to bring into the patient room during delivery as a reminder of what should be documented.

Planning the Study of the Intervention

The successful implementation of the hourly huddles and checklist is expected to increase communication and awareness, and decrease variability in practice during the second stage of labor. This study design is observational and quantitative, and included chart reviews to determine compliance with the huddles and checklist.

Methods of Evaluation

Quantitative procedures were utilized to determine effectiveness of the implementation. Checklists were examined to determine compliance. Each section of the checklist was assigned one point for a total of 9 points. Post-implementation charts were examined to determine the total number of checklist sections completed ($x/9$). For a section to be considered complete, all information required on the checklist had to be documented. The checklist completion percentage was calculated ($x/9 \times 100$) and recorded. A percentage from 0%-100% was assigned to each checklist based on completeness. Individual delivery charts were reviewed for documentation of checklist items in the electronic health record. All deliveries, excluding scheduled cesarean sections, patients that never reached full dilation, and patients that delivered within 15 minutes of complete dilation, were included in the post-implementation data collection. Data was collected for a period of 14 days, resulting in 16 deliveries. Data collection was conducted by one individual to reduce variance in extraction methods. Pre-and post-implementation data were recorded and compared using percent complete as the outcome variable.

Results

Prior to implementation, a retrospective chart review was completed to determine baseline data and current documentation practices. This review examined 20 randomly chosen delivery records from April, May, and June 2015 for compliance with documenting the nine sections of the Checklist. Upon examination, four charts were called cesarean sections that took place prior to complete dilation, and one was a scheduled C-section. These charts were excluded from the review, leaving 15 charts. Of the 15 remaining charts, two did not meet checklist criteria since they delivered within 15 minutes. These were included in the review of complete dilation and station, but excluded from the remainder of the checklist categories, resulting in thirteen ($n=13$) charts. This retrospective review utilized the checklist sections as a guideline to determine what was already being documented by unit staff on a routine basis. Results of the chart review are presented in Figure 1.

The Second Stage Situational Awareness Checklist was implemented over a two-week period during the summer of 2015. Figure 2 shows the results from the nine delivery charts for each item section of the checklist.

Baseline documentation was compared with documentation following implementation of the checklist and hourly huddles. These results are presented in Figure 3.

The average completion rate of the Second Stage Checklist was 43% ($SD \pm 21$) with a range of 22% to 89%. No charts were fully completed, and only two charts were above 50% completion. The remaining charts ($n=7$) were all below 50% completion. Results are shown in Figure 4.

Completed sections of the checklist varied in the post-implementation charts as demonstrated in Figure 2. Not one of the reviewed charts contained a fully complete checklist. All nine charts successfully documented dilation time, station, maternal status, and fetal status (x=9). Plan of care was discussed with the provider in 67% (x=6) of the charts. Hourly huddles were completed in 33% (x=3) of the charts. Maternal status and fetal status were reviewed with the provider during huddles in 33% (x=3) of the charts, and plan of care was discussed with patient/family at 33% (x=3) as well. Staff present at the huddle was documented in 33% (x=3) of the charts, and time of next huddle was never documented (x=0) in any of the post implementation charts.

Figure 1: Baseline documentation results

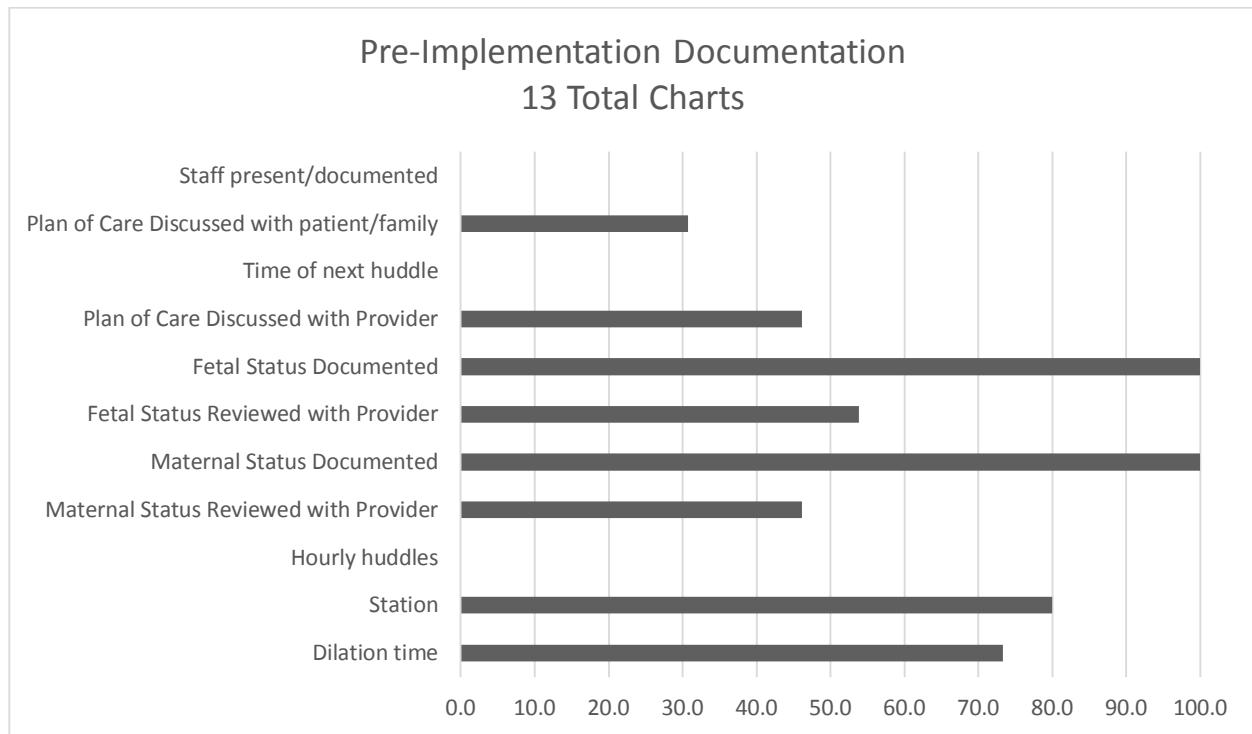


Figure 2: Post-Implementation documentation results

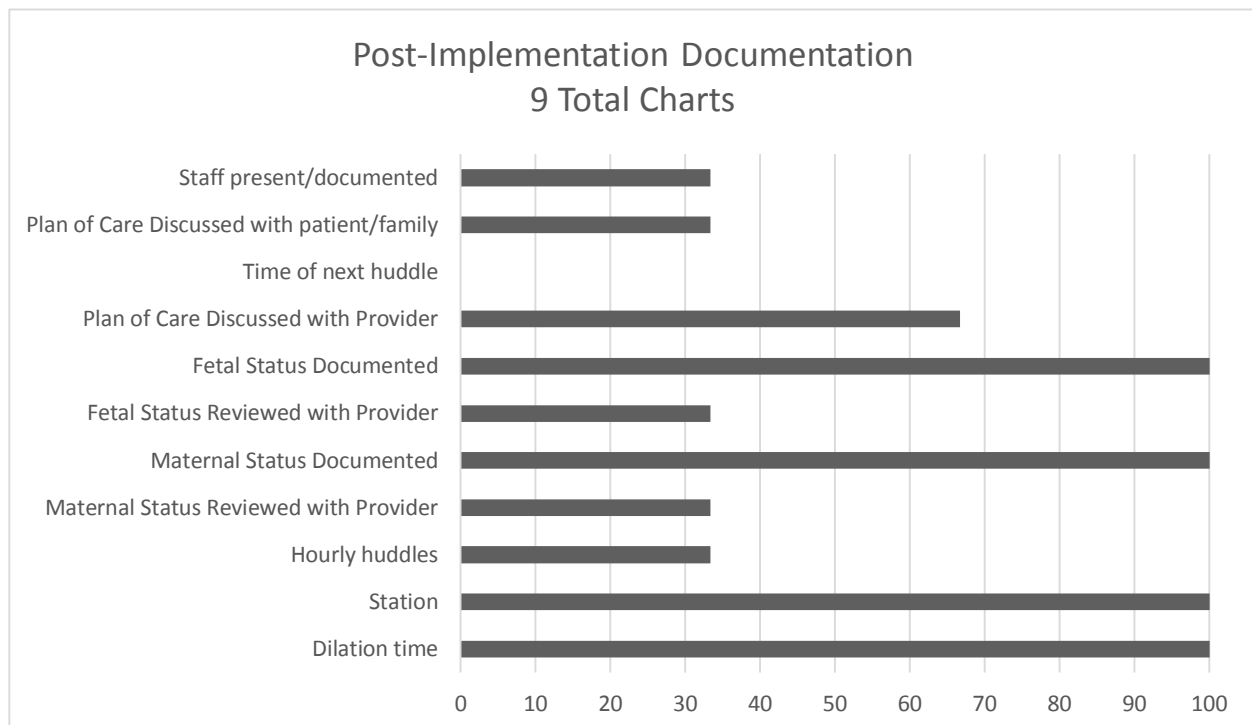


Figure 3: Comparison of baseline and post-implementation documentation results

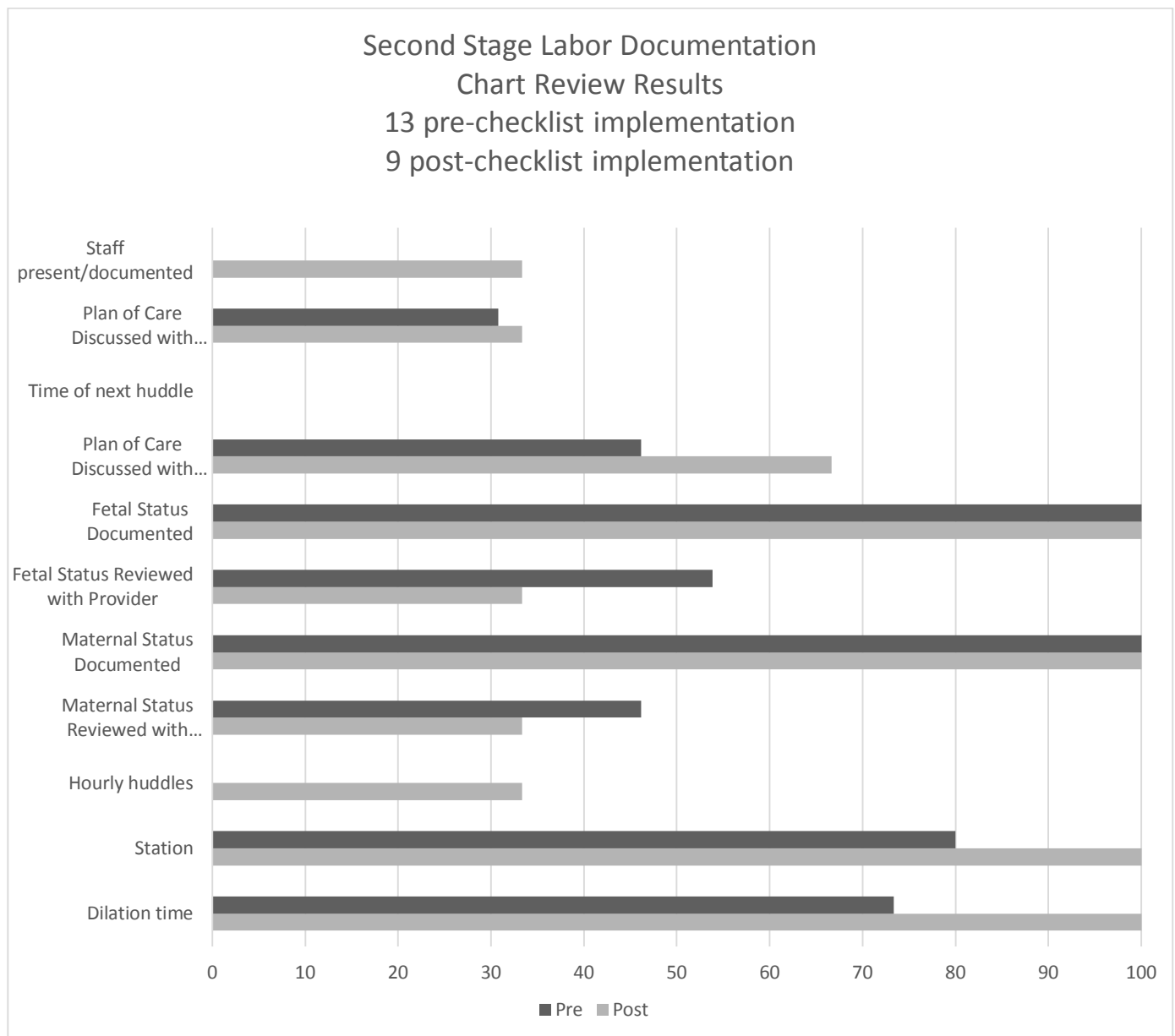
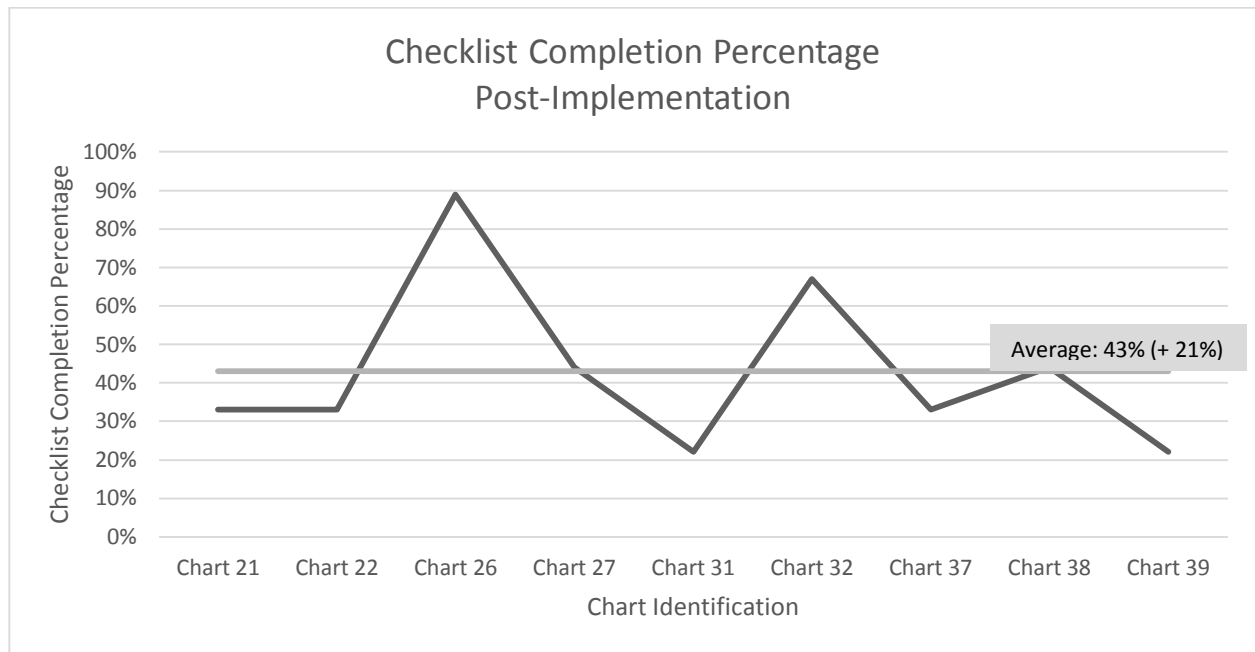


Figure 4: Checklist Completion percentage by chart



Discussion

Summary of Findings

Pre-implementation documentation review showed that staff are currently documenting certain pieces of the checklist, but not consistently. All charts examined had both maternal and fetal status documented. There was less consistency with other portions of the checklist. Staff were having discussions with providers regarding both maternal and fetal status, but documentation showed this only happening approximately half of the time. There was also inconsistent documentation of plan of care discussions with the patient

Discussion of Results

This particular percentage is surprising since patient-centered care is so important. Patient-centered care cannot be practiced if these discussions are not happening. Proper documentation is very important. If it is not documented, there is no evidence that it happened. Staff may be performing these tasks on a routine basis, but are not documenting them sufficiently, giving the appearance that they are not occurring at all. One difficulty with current documentation is determining when a provider is in the room and when they are not. After reviewing the charts, it was easy to determine when the provider entered the room and was at the bedside, but there was no information on how long the provider stayed or when the provider left the room. This made it difficult to determine exactly when the provider is actually present in the room and when they are not. Therefore, it is difficult to decipher if maternal and fetal status, plan of care, and other discussions are occurring during this time and not being

documented. Since the delivery room is a busy place, it is possible discussions are occurring and unfortunately not being documented.

The checklist and hourly huddles create opportunity to maintain situational awareness during the second stage by providing consistent times for discussions, and a standardized set of factors to discuss. It was anticipated that implementing the checklist would prompt staff to have these discussions and increase the consistency of documentation. However, the results were mixed. In most cases, post implementation documentation was more successful. Post-implementation chart reviews resulted in more consistent documentation of complete dilation time, as well as plan of care discussions with the provider. These results were anticipated since hourly huddles are scheduled based on complete dilation time and provide the opportunity to have the plan of care discussions with the provider. However, there was a decline in documentation of maternal and fetal status being reviewed with the provider. This was an unexpected finding since the checklist should have prompted more structured provider review.

The hourly huddles and checklist were only utilized 33% of the time, so even though staff attending other deliveries did not use the checklist, plan of care discussions were still conducted with the provider. However, these discussions did not occur in the context of the hourly huddle. In comparison to pre-implementation data, staff were more consistently having discussions with both providers and patients. These discussions help staff maintain situational awareness during the changing events of the second stage, especially if it is prolonged. The increase in discussions should result in an increase in situational awareness.

Comparison of pre and post-implementation data showed an increase in most documentation after implementation as expected. Unexpectedly, documentation prior to implementation demonstrated staff reviewing maternal and fetal status more consistently with the provider than after implementation. This could be attributed to the fact that huddles were only conducted 33% of the time, therefore maternal status and fetal status were only documented as being discussed during those huddles. Requiring documentation of complete dilation time on the checklist may have reminded staff to document this in the chart, resulting in the increase from 73% to 100%. While documenting the time of next huddle was not expected pre implementation, it was expected post implementation; however, it was not documented in any of the charts. Further study into why it was not documented will need to be completed to move the project forward.

Implementation of the Second Stage Situational Awareness checklist resulted an increase in hourly huddles and checklist completion, but did not meet the specific aim of the project. Huddles were conducted 33% of the time, and the average checklist completion percentage was 43%. This was less than the anticipated 80% completion percentage stated in the project aim. It appears that even though huddles were only documented as occurring in 33% of the charts, staff were more consistent in their documentation, which resulted in the higher checklist completion percentage. Staff seemed to be using the huddles to remind them of what to document but were not necessarily having the hourly connection with providers. It is possible huddles were occurring and not being documented in the patient EHR, making it impossible to confirm whether they were held or not. The huddles must occur to result in practice change. The checklist serves as a reminder of what to discuss during the huddles.

Since there was no existing checklist prior to implementation, the increase in utilization is promising. Several factors may have contributed to the less than anticipated completion percentage. As the second stage of labor progresses, the delivery suite can become a tense and demanding environment. Staff may have found the checklist cumbersome and the additional documentation difficult to keep up with, resulting in incomplete checklists. Strategies for making the checklist routine practice will help to alleviate this barrier. Continued education and follow up is needed to ensure consistent use of the checklist and hourly huddles in everyday practice.

Relation to Other Evidence

Currently, research studies have not determined the usefulness of standardized checklists and hourly huddles for situational awareness in the delivery room because it is an emerging topic with limited research available. There are no clinical studies documenting their effectiveness of use in the delivery suite. However, there are several articles that have presented the possible benefits of utilizing this technique as part of obstetrical practice. There is, however, research that shows checklists are a useful strategy for maintaining situational awareness. The World Health Organization Surgical Safety Checklist has been shown in a random-allocation trial to be effective in reducing perioperative complications and has potential to be adapted for use in maternity units (Edozien, 2015).

Limitations

There are numerous limitations to this study. First, the project was implemented during a very limited time frame during the summer months. Many of the regular staff were on

vacation and the unit was utilizing a large number of per diem staff to fill positions. Per diem staff were emailed the staff education PowerPoint, and received reminders weekly in the unit “Johnny notes”, but may not have been available for staff education sessions held on the unit. This may have resulted in a decreased use of the checklist since per diem staff may have been unable to ask questions or seek clarification. The limited time frame only allowed a small number of staff (39%) to receive the education prior to implementation. This may have also contributed to the small percentage of checklist usage and completion, as many staff were not educated in its use prior to being assigned a labor patient.

Another limitation of the study was sample size. The limited time only allowed for the review of a small number of charts. Many of the deliveries during this time period were either C-sections or patients that delivered within 15 minutes. These deliveries do not meet the criteria for checklist use and therefore could not be included in the sample. The limited sample size may not clearly reflect true results. Small sample size has a negative effect on statistical power, significance, distribution, and an increased likelihood of Type II errors (Verial, 2015). A larger sample size would be needed to make a definitive determination of the projects impact.

Staff were also aware that chart reviews were going to be conducted post implementation. This may have increased their documentation and use of the checklist. Knowing that their work was going to be reviewed may have prompted staff to provide the additional documentation more than they would have if there were no knowledge of the review. This may have resulted in an overestimate of usage.

All of these limitations effect the reproducibility and of the project results. Adjusting the sample size to include a larger number of deliveries and conducting the project over a much longer time period would alleviate these limitations and produce more reliable data. Extending the time frame provides more opportunities to educate the entire staff, provide continued guidance on using the huddles and checklist in practice, and provide opportunities for staff feedback.

Efforts were made to minimize the impact of these limitations by providing staff with an emailed version of the education session for self-review, as well as, reminders to staff in the weekly newsletter regarding the project and the education. The main researcher and clinical leaders were available during implementation for project questions. It is important that reminders and education continue until the checklist and huddles become everyday practice. This ensures that the change will be sustainable for a long period of time. Periodic chart reviews should be conducted to determine the continued use of the checklist and huddles in practice. Workflow analysis studies should be conducted to determine ways to streamline the huddle and checklist process. This will help to determine the most efficient way to incorporate the process change into practice. By conducting these studies, inefficiencies associated with practice variation can be reduced. Once completed, a standard procedure for huddle and checklist use in practice can be determined.

Recommendations

This quality improvement project was the beginning piece of a major process change on the unit. Continued staff education is needed to ensure all staff are comfortable using the

checklist and participating in the hourly huddles. Once all staff have received the education and have had the opportunity to use the checklist and huddles in practice, it would be beneficial to conduct a survey of both nursing staff and providers to determine how the new process is working and examine any perceived barriers. The information from the survey can be used to re-work the checklist and huddle process as needed.

Another recommendation would be to upgrade the computer system currently used by the Unit to include a tab for hourly huddles. The tab would include a subsection for each item on the checklist. Having the huddle tab and the items of the checklist available on the computer would reduce the double documenting associated with the current paper checklist. It would also serve as a prompt for the staff to include the huddles as a routine part of second stage management. Having a set place for documentation reduces variability in documentation methods. Another recommendation for the computer upgrade would be alarms, or prompts. Setting the system to pop up a reminder that hourly huddles are due would prompt staff to conduct the huddles. Documentation of complete dilation would trigger a countdown clock that would pop up the first reminder at one hour and then continue to display the pop up hourly until delivery time is documented. These prompts would continually remind the staff that hourly huddles need to be conducted and the checklist item documented in the patient chart.

Once the checklist and huddles become a routine part of second stage management, future research projects should examine how the new process effects maternal and fetal outcomes. Studies should examine the effect on neonatal Apgar scoring and delivery mode. It is hypothesized that Apgar scores will increase and cesarean delivery rates will decrease due to the heightened awareness of the changing variables in the delivery room and the hourly

huddles. Patient satisfaction with the delivery experience should also be considered an area for future study.

CNL Implications

The Clinical Nurse Leader (CNL) is responsible for the education and implementation piece of the project, as well as tracking its success or failure. It is recommended that the CNL continue using small increments of change to successfully integrate the checklist and huddles into everyday practice. Improving outcomes is the ultimate goal of the process change. Once the practice becomes routine and has been successfully integrated into practice, the CNL should examine the relationship between the process change and outcomes. This includes both maternal and fetal outcomes. Tracking these outcomes will help move the project forward and provides evidence as to whether the change has made actual improvements.

Conclusion

While the project did not meet the aim, the results are promising. More time and further examination of possible barriers perceived by the staff will help to move the project forward. Changing the current practice of second stage management is a major process change for the unit. It will require acceptance and compliance from the entire staff, including providers. This process change contains many pieces, with the second stage situational awareness checklist being just one of those pieces. The entire process change will require many additional steps prior to full implementation on the unit. Continued follow up and work re-design are needed to consistently incorporate the checklist and huddles into everyday practice.

Situational awareness is a key factor in patient safety and is an essential skill for staff to acquire for use in the delivery suite. Checklists and huddles are a standardized way to increase situational awareness. These simple, cost effective strategies can be used to advance situational awareness in the delivery room and should be incorporated into routine second stage labor management.

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Appendix A: Second Stage Situational Awareness Checklist

Situational Awareness for Second Stage Management Checklist

| | | |
|---|---------------------------|----------------------------------|
| Fully dilated @ _____ | Station & Position: _____ | Plan of Care reviewed: Yes No |
| Patient informed on admission of periodic huddles? Yes No | | |
| RN: _____ | CNM: _____ | MD/DO: _____ |
| Pushing began @ _____ Time of Delivery: _____ | | |
| NOTE: PCP should be present at the huddle with: <ul style="list-style-type: none"> a) Category II FHR tracing b) 1 hour of active pushing without progress c) If RN requests presence | | |

| 1 HR HUDDLE | 2 HR HUDDLE |
|--|--|
| Time: _____ Maternal Status Reviewed: Yes No Fetal Status Reviewed: Yes No Plan of care discussed & documented: Yes No Time of next huddle: _____ Plan of care discussed with pt/family: Yes No Documented: Yes No Staff Present: RN: _____ CNM: _____ MD/DO: _____ | Time: _____ Maternal Status Reviewed: Yes No Fetal Status Reviewed: Yes No Plan of care discussed & documented: Yes No Time of next huddle: _____ Plan of care discussed with pt/family: Yes No Documented: Yes No Staff Present: RN: _____ CNM: _____ MD/DO: _____ |
| 3 HR HUDDLE | 4 HR HUDDLE |
| Time: _____ Maternal Status Reviewed: Yes No Fetal Status Reviewed: Yes No Plan of care discussed & documented: Yes No Time of next huddle: _____ Plan of care discussed with pt/family: Yes No Documented: Yes No Staff Present: RN: _____ CNM: _____ MD/DO: _____ | Time: _____ Maternal Status Reviewed: Yes No Fetal Status Reviewed: Yes No Plan of care discussed & documented: Yes No Time of next huddle: _____ Plan of care discussed with pt/family: Yes No Documented: Yes No Staff Present: RN: _____ CNM: _____ MD/DO: _____ |