Obstetric Epidural Time-Outs: Will this Promote Patient Safety and Improve Staff Communication? A Quality Improvement Project

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Abstract

Introduction: Anesthesia providers face daily challenges when caring for patients in non-operating room anesthesia (NORA) sites that require non-surgical, invasive procedures. The Joint Commission (TJC) also requires all "surgical and non-surgical invasive procedures" to have a completed safety checklist prior to starting the procedure.

Purpose: The goal of this project was to investigate if an obstetric epidural time-out tool would promote patient safety and increase pre-procedure staff communication.

Method: A quantitative study that assessed safety time-outs and an obstetrical epidural time-out tool on the Labor and Delivery room (LDR) unit at a community hospital in the Midwest.

Results: A pre-intervention questionnaire and information session to launch the study tool were used to obtain a baseline understanding of safety time-outs. A post-intervention questionnaire assessed the OB RNs' increased knowledge at the end of the study. The mean score of the pre and post questionnaire improved from 74.6% to 80%. The 6-week study evaluated the overall completion percentage of the time-out tool. Of the 53 tools returned out of 113, there was an 87.812 mean compliance rate that had 100% of the 10-check boxes completed.

Discussion: Non-surgical invasive procedures are performed in various areas of the hospital. The LDR unit should also adhere to TJC's safety standards during epidural placement.

Keywords: anesthesia, closed claims, complications, epidural, neuraxial, adverse effects, time-outs, safety, and lawsuit.

Obstetric Epidural Time-Outs: Will this Promote Patient Safety and Improve Staff Communication?

Laboring women (parturients) who request an epidural deserve the same adherence to TJC safety standards as those undergoing other procedures or surgery by performing an obstetric epidural time-out prior to placement of any neuraxial anesthesia, which includes an epidural or spinal-epidural. One-fifth of all liability claims are from regional anesthesia despite commonly used techniques (Liu et al., 2019). When time is of the essence, a parturient in pain expects expedited pain relief to be of utmost importance. Obstetric (OB) Registered Nurse (RN) staff assist in the patient's labor and delivery room (LDR) to promptly respond to the patient's request for pain relief. Rushing through important safety measures while limiting conversation to place an epidural quickly is a common practice followed by a more extensive interview after the patient gets comfortable. Labor epidurals are elective procedures, and this jeopardizes the parturient and the unborn baby when safety measures and a thorough obstetric epidural time-out are not performed. Will an obstetric epidural time-out tool promote patient safety and increase pre-procedure staff communication, compared to the current protocol of not obtaining relevant informative patient data prior to an epidural placement?

Background

While women have been having babies for centuries, the introduction of neuraxial analgesia for obstetrical patients started at the end of the 19th century. A Swiss Obstetrician, Oskar Kreis, studied the effects of six laboring women who received cocaine as the primary medication in their spinal anesthesia producing profound pain relief along with associated severe headaches and vomiting (Silva et al., 2010). This complication is referred to as a post-dural puncture headache that is a risk for any spinal or epidural anesthetic procedure. As years went

by, neuraxial techniques were studied and trialed. In 1909, another obstetrician, Walter Stoeckel from Germany, performed 141 caudal epidurals for laboring women with a 50% success rate for analgesia from labor pain (Silva et al., 2010). Neuraxial analgesia prior to the 1960s demonstrated poor reliability, safety concerns, prolonged lower-limb paralysis, and unsatisfied laboring women. Lumbar epidural analgesia would soon replace all previous anesthetic techniques as the preferred technique. Continued improvements with epidural analgesia led to increased patient safety and enhanced patient satisfaction in the 1970s and 1980s (Evans et al., 1979). Between 1981 and 2001, the administration of epidural analgesia to laboring women had tripled in the United States, with an average rate of 60% of women receiving labor epidurals (Bucklin et al., 2005). A Stanford University (2021) study reported that approximately 3/4 of all women in the United States receive epidurals for labor analgesia. With the increased volume of neuraxial analgesia performed on laboring women, side effects, untoward events, and complications are also increased (Grant et al., 2015). According to Szypula et al. (2010), the single largest anesthesia-related claims reports are from regional anesthetics, and of those, 51% were obstetric related. Claims related to regional anesthesia included inadequate pain blocks during labor or a cesarean section, nerve damage, back pain, infection, and drug errors (Szypula et al., 2010).

The goal for labor analgesia in the setting of neuraxial techniques is to provide adequate pain relief while preserving motor function (American Association of Nurse Anesthetists [AANA], 2017). Nurse anesthetists also have a duty to keep patients informed and safe with their care. According to the community hospital policy at the selected clinical site, any invasive bedside procedure done in a non-OR setting that requires anesthesia to be involved, includes a time-out to be performed immediately before starting a procedure, titled Safe Procedure Review

(Clinical Site Policy Manual, 2019). A completed, Safe Procedure Review includes patient identification, site marking, procedure site, "time out" procedure, and a fire risk score documented but not a part of the medical records. According to the Association of periOperative Registered Nurses (AORN), time-outs are recommended practices, and adherence to guidelines are necessary (AORN, 2009). This quantitative project trialed an obstetric epidural time-out tool to maintain current safety standards with TJC and hospital policies along with improving staff communication.

Problem Statement

Laboring women expect prompt, efficient, safe care when they are requesting epidural placement. The principal investigator (PI) has observed very few LDRs that perform time-outs prior to an epidural placement. Implementation of a detailed obstetric epidural time-out tool to promote patient safety and improve pre-procedure staff communication will also adhere to TJC's Universal Protocol with a completed safety checklist.

Organizational "Gap" Analysis of Project Site

The clinical site where the DNP project was conducted is a community hospital in northwest Indiana licensed for 230 in-patient beds. The hospital opened its doors on December 9, 1939, after the county citizens voted to publicly fund the hospital for $100,000.00 to accommodate rapid growth in the community. In 2012, the original hospital closed its doors and moved to a newly constructed hospital that included modern technology, state-of-the-art patient rooms, and clinical care areas. For 82 years, the community hospital has been steadily growing with the community. Currently, with nine labor and delivery rooms, and three obstetric triage rooms, the hospital supports approximately 1300 deliveries annually. The labor and delivery room nurses have a 2:1 patient to nurse ratio. When a parturient requests an epidural placement,

the Certified Registered Nurse Anesthetist (CRNA) or Anesthesiologist proceeds to assess the patient and review the patient's history. That history includes medical history, surgical history, allergies, laboratory values, anesthesia plan/risks/benefits, and obtaining consent for the procedure. However, a consistent list of time-out questions is not asked, and no formal process is in place on the LDR unit. This omission of an official time-out may lead to missing patient information, important medical diagnoses, critical laboratory values, and medication history that is critical when providing safe care for a parturient requesting a labor epidural. According to the clinical site hospital policy 3734.3 (2019), all patients at the clinical site having an operative, invasive, or bedside procedure will have verification of correct patient, procedure with laterality noted, actively communicate patient safety concerns, and a fire risk score.

The World Health Organization's (WHO) surgical safety checklist includes 19 items that are specific for surgeries; however, the concentration is on pre-surgical criteria and not non-surgical invasive procedures (WHO, 2009). The WHO advised to "modify and revise" for adapting a time-out to a specific Labor Epidural Time Out (LETO) (Myers & Kwock, 2015). Myers & Kwock's (2015) article discussed the following with regards to what a LETO should include:

> Our LETO checklist was created by including items that are universal to pre-procedure checklists, such as identification of the patient, verification of their allergies, confirmation of a completed consent, and availability of emergency equipment (including resuscitation drugs). Items unique to laboring patients and placement of an epidural were then added. For example, we make note of the platelet count and pre-procedure blood pressure as well as asking about the use of anticoagulants and concerns regarding fetal

> heart tones. Hand washing was at the top of our list because it is the standard way to begin a sterile procedure (para 4).

An appropriate time-out is intended to be helpful to report meaningful information. The community hospital has never performed an obstetric time-out prior to an epidural placement. With a specific checklist for time-outs, measurable data can be collected using a 10-point checklist documented prior to each time out. The initial action was to assess the existing knowledge of the OB RN staff with a pre-intervention assessment questionnaire.

Review of Literature

A literature review of obstetric time-outs to promote patient safety and improve pre-procedure staff communication was conducted with the medical subject headings (MeSH) terms: anesthesia, closed claims, complications, epidural, neuraxial, adverse effects, time-outs, safety, and lawsuit. The articles were reviewed to assess the current state of literature; several were more than ten years old. This is due to The Joint Commission (TJC) introducing the Universal Protocol in 2003, followed by the World Health Organization (WHO) "Safe Surgery Checklist" that was released in 2008. Many studies occurred around this same time frame with very few subsequent articles on this subject. Qualitative and quantitative studies available in full text English were included. Articles that only described time-outs and safety and did not focus on non-surgical invasive procedures were excluded. With the additional terms included, less than two were identified during the years 2016 to 2021.

The WHO Surgical Safety Checklist (SSC) was designed to assist operating room staff in providing a safe surgical environment for patients and improve teamwork (Haynes et al., 2009). The checklist led to a 30% decrease in perioperative complications, mortality rates, and increased teamwork and compliance when using the SSC (van Shoeten et al., 2014). Within the

WHO Guidelines for Safe Surgery 2009, 'This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged' (WHO, 2009). An obstetric epidural time-out tool needs to be tailored to provide useful information to safely perform a labor epidural for analgesia (Anim-Somuah, et al., 2018).

The SSC ensures that the healthcare team providing patient care can follow a consistent list of safety steps to avoid preventable errors while in their care (WHO, 2008). There are three phases of the SSC, the first is the 'sign-in' that occurs prior to the induction of anesthesia with all team members present and the patient still able to participate and be able to ask and answer questions, the second phase is the actual 'time-out' that is a run-down of questions just prior to incision that confirms the correct patient, laterality of operation and any critical elements for the procedure/or surgery, and the third phase is the 'sign-out' that is done at the completion of surgery mainly for surgical equipment counts and any important factors regarding the patient prior to leaving the OR (WHO, 2008).

Time-outs were introduced nearly two decades ago to prevent surgical errors (wrong-patient, wrong-site, wrong-procedure, wrong-surgery) and improve surgical safety, yet errors are still made today. Why is the simplest time-out procedure that ensures the safety of patients still inefficient and not 100% fail-safe? Patients come to the hospital to be safely cared for; they do not come to make their situation worse. Despite global initiatives to have universal protocols to prevent surgical errors, 44,000 to 98,000 patients die in the United States annually from preventable errors, which equates to the 8th leading cause of death (Kohn et al., 2000). Communication failures commonly lead to increased complications and adverse events. With more than 234 million surgical procedures performed annually around the globe, the need for an improved surgical safety initiative to prevent errors in their care needs to occur with each patient

encounter (Weiser et al., 2008). In 2016, 104 sentinel events that involved wrong patient, wrong site, or wrong surgery were reported to TJC despite the implementation of the time-out (The Joint Commission, 2017).

Many articles have only discussed the time-out procedures done in operating rooms (OR) and do not specify time-outs in other areas of the hospital where procedures are performed. According to TJC's Universal Protocol, a completed time-out is to be performed prior to every "surgical and non-surgical invasive procedure" (Myers & Kwock, 2015). Beyond the OR, off-site locations for non-surgical invasive procedures that use a safety time-out prior to procedures include Gastrointestinal (GI) suites, Interventional Radiology (IR), Magnetic resonance imaging (MRI), and Vascular labs. There should be no difference in providing the same safety measures when a procedure is requested on the Labor and Delivery unit in accordance with TJC's safety standards. In the PI's clinical experience, a completed time-out is rarely done for a parturient that requests a labor epidural, whereas time-outs are consistently performed for surgical patients.

According to Haridarshan et al. (2018), after a retrospective pre-intervention study with 218 patients followed by a prospective study with 248 patients using the WHO SSC post-intervention tool, there was a decrease in surgical complications from 5.1 to 2.41%. Post-surgical complications were reduced from 6.48 to 4.44%, and anesthesia complications decreased from 2.78 to 1.61% intraoperatively and 1.4 to 0.8% postoperatively (Haridarshan et al., 2028). Haynes et al., (2021) studied the attempt to reduce mortality rates across eight hospitals using the SSC; with a total of 3,955 patients the rate of deaths decreased from 1.5% to 0.8%, and inpatient complications decreased from 11% to 7% after the introduction of the SSC.

Barriers to implementation of a surgical time-out include the introduction of an SSC, which requires a change in workflow and increased workload to the staff. This can result in

active resistance or passive non-compliance with OR staff, team members, surgeons, and anesthesia providers (Bergs et al., 2015). Inadequate communication between staff members that can lead to incomplete surgical checklists, lack of self-discipline to listen carefully, non-adherence to executing the surgical checklist, and lack of key participating staff members who are committed in the process are all examples of how poor attitudes can influence a new process (Russ et al., 2015). Factors that increase the adherence of an SSC include staff who shared a common goal in patient safety or felt like they were part of a team when there was full staff participation (Schwendimann et al., 2019). Establishing consistent use of the SSC and being present in the actual moment of pause during the time-out is an important factor to increase staff adherence. The staff needs to be focused during this important safety measure to ensure that the procedural factors that influence the checklist implementation are executed in a positive manner to promote patient and surgical safety in the OR (Treadwell et al., 2014). Prior to the implementation of TJC's "Safe Surgery 2015", at one Minnesota hospital, a wrong-site procedure every 12 to 13 days was a regular occurrence (Butcher, 2011). Wrong-site surgery is only one of the complications that is seen in malpractice cases. Medicolegal claims with the use of neuraxial anesthesia and general anesthesia are on the minds of anesthesia providers at all times. With the impact of the Safe Surgery Saves Lives (SSSL) campaign in 2008, the initiative to incorporate an SSC to enhance surgical patients' safety was a step in the right direction.

Evidence-based Practice: Verification of Chosen Option

Walker, Reshamwalla, and Wilson (2012) reported that safety checklists promoted safer patient care. Implementation of evidence-based practice for the WHO SSC and literature review of related studies on use of the safety checklist was the basis for the article. Utilizing a safety checklist has been successful in urgent/emergent surgical procedures; however, this article

discussed how implementing the safety checklist can be challenging. The safety checklist needs to be an effective tool well supported and adapted for nurse practice changes to improve patient safety. Walker, Reshamwalla, and Wilson (2012, p. 2) voiced that "Checklists should be evidence-based and address key safety items that, if overlooked, could lead to serious adverse outcomes." Will an obstetric epidural time-out tool promote patient safety and increase pre-procedure staff communication, compared to the current protocol of not specifically answering a set of informative patient data prior to an epidural placement?

Theoretical Framework

The change theory that guided the scholarly project is Lewin's Theory of Planned Change. Kurt Lewin's Change Theory incorporates a 3-stage model of change that is also referred to as the "unfreezing-change-refreeze model" (Corley & Gioia, 2004). Lewin's Theory requires that a person must possess prior knowledge before this theory can exist. One must set aside any preconceived notion of the subject matter, also known as unfreezing existing knowledge. Then, to change, they must open their mind to allow a new process to take the place of the previous way of doing things. Refreezing implies that you have established a new habit and are no longer reverting to the old way of doing things. This theory was developed to cover multiple scenarios; however, with this quality improvement project, the change seemed to align well with the same outcomes. The DNP project implemented the obstetric epidural time-out tool that is utilized prior to epidural placement.

Schein (1999) emphasized there is some type of resistance associated with any sort of change or a new form of learning in many instances. With the introduction of the obstetric epidural time-out tool, this will may be perceived as a potential nuisance, waste of time, or even avoidance of the new intervention. The unfreezing stage is the first step in conditioning the staff

to understand that there is a need for an obstetric epidural time-out tool to be completed to increase patient safety, improve staff communication, and to understand that not performing a time-out is considered unacceptable. The change stage is the actual intervention of using the obstetric epidural time-out tool prior to epidural placement. During this time, the OB RN staff will need positive reinforcement and feedback on what they are doing correctly to continue with a smooth transition to the third stage, refreezing. When an obstetric epidural time-out is completed prior to epidural placement, repetitious behavior can motivate staff members to concede to the new process changes and avoid relapsing to previous bad habits. According to Grossmeier (2020), an ecological approach has been determined to be the most reasonable and effective behavior change initiative that includes "individual and group-level interventions that supports promoting health-policies and increasing access to resources" (p. 316).

Goals, Objectives, and Expected Outcomes

The DNP project aimed to develop and implement an obstetric epidural time-out tool to be used during time-outs prior to epidural placement. This was a pre/post-test design project with a quality improvement focus. There had not been any formal education on this topic or follow-up education at the selected clinical site. The project included a pre-intervention assessment questionnaire that established a baseline on safety-checklist education for the OB RN staff. Additionally, there was an informal information session with the OB RN staff that was held to review the obstetric epidural time-out tool and project implementation. Each of the 10-questions on the pre-intervention assessment questionnaire were discussed with the OB RN staff. All questions were answered to ensure an effective process.

The outcome measure, the knowledge score, was the interval variable derived from the percentage of correct answer choices from the pre-post intervention assessment questionnaires.

The outcome measure was collected at week 1 and week 6. A secondary outcome was the adherence rate of the safety component checklist (obstetric epidural time-out tool). The adherence rate was derived from the number of tasks performed as evidenced by the obstetric epidural time-out tool checked boxes that were completed prior to an epidural procedure.

At the end of the six-weeks of data collection, the PI assessed the increased education and experience with regards to the obstetric epidural time-out tool initiative. Knowledge gained was evaluated by pre/post intervention assessment questionnaires and an educational information session that discussed safety practices with time out procedures and hospital accreditation standards. Opportunity was provided to staff to address questions to ensure the education and obstetric epidural time-out tool fit the needs of the unit. Project success was measured by adherence to the tool for labor epidural placement.

Method

The intervention included an investigator-developed 10-question true/false, pre/post intervention assessment questionnaire and pre-project baseline education. During the informal informational discussion with the OB RN staff, the rationale for development of time-outs by TJC and WHO was discussed. The importance of an epidural time-out and the expected components of a time-out were reviewed. Knowledge regarding conducting the time-out and barriers to completion were explored with the staff. The intervention assessment identified if the OB RNs felt anxiety by initiating the time-out and if using an obstetric epidural time-out tool led to improved confidence in performing the time-out.

The obstetric epidural time-out tool included 10 patient-data questions to be addressed prior to epidural placement. Each time a parturient requested an epidural placement, the OB RN was asked to complete the obstetric epidural time-out tool data and have the patient ready to

proceed with her time-out and epidural placement. The OB RN was the main staff member who performed the time-out and could either write in the patient data pre-procedurally or check each box as each data question/statement was addressed. When the time-out was completed, the anesthesia provider would then perform the epidural placement. The OB RN placed the time-out card in a locked box for study safety.

The time-out tool was assessed for completeness and if there were any questions or trends that indicated a need for re-education or questions. A final post-intervention assessment questionnaire that consisted of the identical 10-questions as the pre-intervention assessment questionnaire was administered to each study participant post-project and assessed to evaluate increased epidural time-out knowledge. Change in educational thought processes, completeness, and consistency of performing the obstetric epidural time-out tool prior to epidural placement were evaluated.

Project Design

The DNP project design focused on the development of an evidence-based education and practice intervention and the creation of an obstetric epidural time-out tool. The obstetric epidural time-out tool included current and relevant patient data while maintaining compliance with TJC safety standards prior to an invasive procedure. The current research reports that consistent education on performing time-outs increases patient safety (Vance et al., 2021). The process used in this project can be modified for use to promote time-outs prior to any non-surgical invasive procedure, further expanding safe patient care in other areas.

Project Site and Population

The setting was in a midwestern community hospital. The population included OB RN staff employed at the community hospital in northwest Indiana. Approximately 25-30 OB RN

staff members were either employed as full-time, part-time, or casual staff; none were excluded from this study. There were approximately 1,300 births annually, including both vaginal and cesarean deliveries at the time of the study. The focus was on parturients who requested an epidural in the LDR suites. Expectations were that the OB RN staff would be welcoming and accommodating to have a safety checklist to promote patient safety and improve staff communication.

Measurement Instruments

An investigator-developed pre/post intervention assessment questionnaire consisting of 10 questions with true/false answers was used to measure outcomes for the DNP project. The comparison between the pre-and post-responses was completed using the non-parametric version of a paired t-test, the Wilcoxon Signed Rank statistical test. The obstetric epidural time-out tool was evaluated to determine completeness of each question and rate of non-compliance. A similar 12-item, labor epidural time-out checklist tool has been well received by both nursing staff and anesthesia providers (Myers & Kwok, 2015). The investigator developed the 10-question obstetric epidural time-out tool with permission obtained from the authors to modify the 12-item tool to meet the current needs of this DNP project.

The obstetric pre/post intervention assessment questionnaire is included in Appendix A. This instrument was used to assess changes in staff knowledge before and after the DNP project. The obstetric epidural time-out tool is included in Appendix B. The time-out tool was used to assess promotion of patient safety based on the percentage of completed check boxes from each instrument.

Data Collection Procedures

The PI implemented an obstetric epidural time-out tool that would adhere to the Joint Commission safety standards, promote patient safety, and increase staff communication. The pre-intervention assessment questionnaire was administered to all OB RN study participants to complete. The next step was an informal educational session to review the project specifics and implementation of the obstetric epidural time-out tool to the study participants. A post-intervention assessment questionnaire was administered to all OB RN study participants when the project time frame was complete. The pre/post assessment questionnaires were anonymous without any identifying criteria. The pre/post intervention assessment questionnaires were evaluated for the OB RN's knowledge gained in education on safety checklists. All questions were evaluated for completeness of each obstetric epidural time-out tool. After the study completion, a follow-up information session with the final data was presented to the OB RN staff along with key stakeholders. Recommendations for revisions to the process and instrument for future consideration by the organization were discussed and well received.

Data Analysis

Quantitative data collection was implemented using the pre/post intervention assessment questionnaire. The two units that were measured were the knowledge scores and the safety component checklists. The OB RN staff was the unit measure for the knowledge scores and the completed checklists were the safety components. See Appendices A and B.

The knowledge scores and time-out tools safety component check list were statistically analyzed using the nonparametric Wilcoxon Signed Rank test statistic. The Gpower software determined that with a limit of 24 OB RN study participants, data would yield 75% power with a moderate effect size. The nonparametric test statistic was preferred due to its ability to handle small sample sizes (Fagerland, 2012). The sample size was the number of OB RNs that were

study participants. Calculations for the knowledge scores were obtained from the pre-intervention assessment questionnaire from week 1 and the post-intervention assessment questionnaire from week 6. Any statistically significant difference was detected using an alpha level of 0.05. The Statistical Package for the Social Sciences (SPSS) version 27 software was used to analyze the data.

Descriptive statistics, such as mean and standard deviation, were analyzed for all interval variables. Frequency and percentages were used to summarize nominal and ordinal variables. See Figures 1 and 2, and Table 2.

Cost-Benefit Analysis/Budget

All costs incurred for the project were paid by the principal investigator. The pre/post intervention assessment questionnaires and the obstetric epidural time-out tools were printed professionally at a cost of $100.00. The time of the principal investigator (approximately 8 hours per week) was not reimbursed. There were no associated costs for the hospital or participants. There were no capital nor operational costs for this project. Participants were volunteers and were not paid to participate in the project.

Timeline

Project development was initiated fall 2021 and concluded summer 2022. See Table 2.

Ethical Considerations/Protection of Human Subjects

The clinical site approved the project and because the site did not have an institutional review board (IRB), deferred approval of the project to the University of Alabama (UA). The UA IRB approval was obtained prior to initiating the project. This quantitative improvement project was both an educational and practice intervention that proposed to increase patient safety and improve staff communication. This project maintained complete confidentiality of patient

involvement based on the Health Insurance Portability and Accountability Act of 1996 (HIPAA), including a reliance agreement with the clinical site. All aggregate data were disposed of after data collection was completed. The obstetric epidural time-out tool was kept in a locked box for study safety after each epidural placement. Access to the locked box was only available to the principal investigator. All data were transferred to an Excel file prior to analysis. Data were stored in the UA Box, a HIPAA-compliant, cloud-based storage facility.

Results

The Wilcoxon Signed Rank test was performed to compare the outcomes of the pre-intervention assessment questionnaire and the post-intervention assessment questionnaire to determine if there was an increase in knowledge with the OB RN staff. The independent variable consisted of two categorical matched pairs, in this case, the same participants were involved in the pre and post study periods. This comparison pinpointed the importance of epidural time-outs and compared if the OB RN's confidence level was increased when performing the time-out prior to an epidural placement because of their increased knowledge base. This, in effect, would determine the promotion of patient safety

There initially were a total of 24 OB RNs that participated in the study, two of the participants were unable to finish the study due to personal reasons. The pre-intervention assessment questionnaire was filled out by all 24 study participants. Of those 24 study participants, the pre-questionnaire mean score was 74.6% and the standard deviation was (9.8) with a P-value of 0.040. The post-intervention assessment questionnaire was filled out by 22 study participants. The mean score was 80% with a P-value of <0.05%. The post-intervention assessment questionnaire demonstrated that there was an increase in obstetric epidural time-out education.

Out of 113 epidurals performed during the study period, 53 had an obstetric epidural time-out tool filled out and returned to the study lock box. Of the 53 tools returned, there was an 87.812 mean compliance rate that had 100% of the 10-check boxes filled out with a standard deviation of 31.42840. The desired return rate was 100%. No specific items on the tool were consistently omitted and no correlation was identified between the omitted items on the tool and the knowledge of the RNs.

Interpretation/Discussion

The goal of this quality improvement project was to establish a baseline of obstetric epidural time-out education with the OB RN staff at the clinical site, educate about the obstetric epidural time-out tool to be utilized prior to epidural placements, and determine if the tool would be used by the staff, thus promoting patient safety and increased pre-procedure staff communication. Data were collected over a period of six weeks. The results were significant ($p = <0.05$) as evidenced by the pre- and post-intervention assessment questionnaires that were administered to the OB RNs. True/false questions one (TJC requirement) and seven (anticoagulation status) of the pre-intervention assessment questionnaire were marked incorrect by three OB RNs, and true/false question number 4 (vital signs and laboratory studies) was marked incorrect by five OB RNs. The information in the three most incorrectly marked true/false assessment questions included knowing that a time-out is a Joint Commission requirement, a time-out provides information about patient vital signs and laboratory studies, and that anticoagulation status is a component of a time-out assessment. In the post-intervention assessment questionnaire, question one, seven, and four were all answered correctly.

Informal feedback from the OB RN study participants voiced that some were nervous and anxious in the beginning of the study, but with repetition with the implementation of using the

obstetric epidural time-out tool, the tool was easy to perform prior to epidural placements. On two of the time-out tools, a written note stating that the RN was too anxious to perform the time-out was documented. The obstetric epidural time-out tool data showed that approximately 47% of requested epidurals had the time-out tool completed prior to epidural placement. The findings of this study were consistent with and reinforce the factors that increase the adherence to performing a time-out (Schwendimann et al., 2019), which includes staff who share a common goal in patient safety and who are part of a team when there was full staff participation.

Compliance rates of utilizing the obstetric epidural time-out tool with 100% completion of all 10-questions were calculated weekly to determine progression. Week one had an 80% compliance rate, whereas week six had a 100% compliance rate as expected. The progression from week one to week two had an expected increase in compliance from 80 to 89%. From week two to week four, there was a steady decline showing 89% to 78% compliance. Weeks five and six were at 95% and 100% compliance. See Figures 1 and 2.

There were 19 epidurals completed during week one with a mean daily rate of 2.71 and standard deviation of 0.95. Week one had a total of 4 epidural time-outs not done with a mean daily rate of 1.33 and standard deviation of 0.58. Compared with week four data collection, there were 17 epidurals completed with a mean rate of 2.43 and standard deviation of 1.27; and 12 obstetric epidural time-outs not completed with a mean rate of 2.40 and standard deviation of 1.34. See Table 1.

Limitations to this study relate to the 60 opportunities to complete the tool that were not conducted. These limitations could include anxiety of the OB RN performing the obstetric epidural time-out tool prior to epidural placement, push-back from either the OB RN staff or Anesthesia staff that did not want to use the time-out tool. Some of the OB RN staff were not

study participants due to being per diem staff and not working when the study was initiated or were on a leave of absence. The investigator was unable to discern how many time-out tools were not completed because the RN was not a participant in the study.

Conclusion

With the impact of the Safe Surgery Saves Lives (SSSL) campaign in 2008, the initiative to incorporate a surgical safety checklist to enhance surgical patients' safety was a step in the right direction. Laboring women who request an epidural deserve the same adherence to TJC safety standards by performing an obstetric epidural time-out prior to placement of any neuraxial anesthesia, which includes an epidural or spinal-epidural. Having a set protocol in place to promote patient safety and improve pre-procedure staff communication with an obstetric epidural time-out tool will accomplish this. There has been little research on non-surgical invasive procedural time-outs, with most literature highlighting pre-surgical safety. The primary goal of this project was to investigate if an obstetric epidural time-out tool would promote patient safety and increase pre-procedure staff communication prior to the procedure, compared to the current protocol of not specifically answering a set of informative patient data prior to an epidural placement. The PI set out to accomplish awareness for the promotion of patient safety and increase pre-procedure staff communication indirectly by using a specific obstetric epidural time-out prior to epidural placement. Not only did this quality improvement project accomplish the established purpose, but the OB nursing staff shared that as they used the tool, they were able to incorporate the time-out tool effortlessly. A culture of leadership support of evidence-based practice is an important factor in engaging stakeholders at all levels and a potential strength for implementing the obstetric epidural time-out tool.

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Table 1

Completed epidurals versus time-outs not completed weekly

Week		N	Sum	Mean	Std. Deviation
1	Number of epidurals completed	7	19	2.71	.95
	Number of time-outs not completed	3	4	1.33	.58
2	Number of epidurals completed	7	19	2.71	1.11
	Number of time-outs not completed	6	9	1.50	.55
3	Number of epidurals completed	6	15	2.50	1.76
	Number of time-outs not completed	5	9	1.80	.84
4	Number of epidurals completed	7	17	2.43	1.27
	Number of time-outs not completed	5	12	2.40	1.34
5	Number of epidurals completed	7	17	2.43	1.72
	Number of time-outs not completed	5	13	2.60	2.07
6	Number of epidurals completed	7	17	2.43	1.72
	Number of time-outs not completed	6	14	2.33	1.21

N=number of days during the week that epidurals were completed
N=number of days during the week that obstetric epidural time-outs were not completed

Sum=total number of epidurals completed during specified week
Sum=total number of obstetric epidural time-outs not completed during specified week

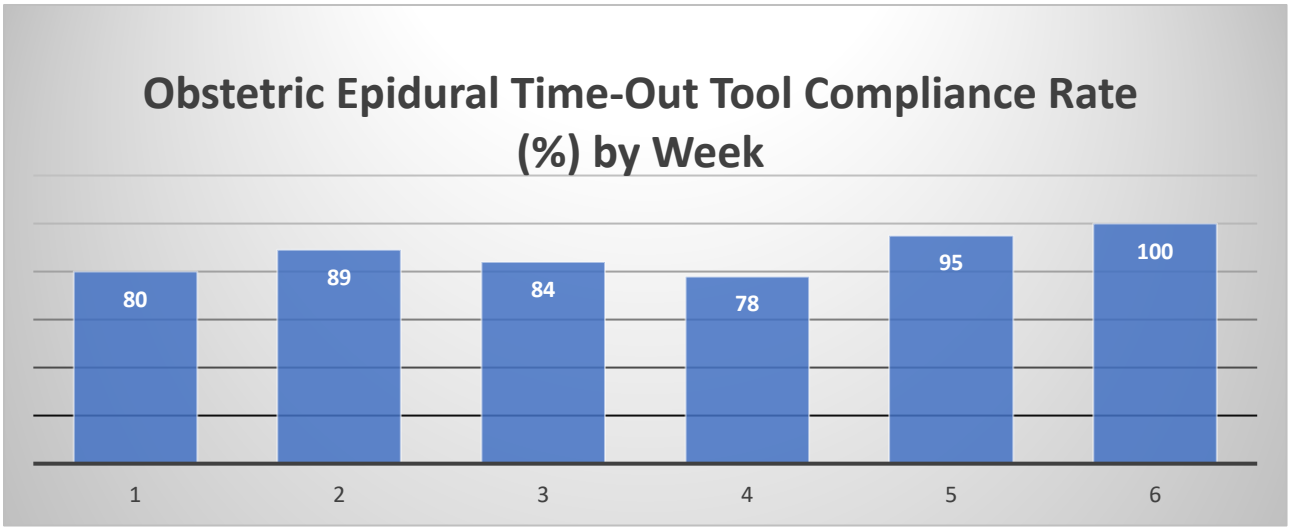
Table 2

DNP project timeline

August 2021-February 2022	Proposal developed and approved by faculty advisor
March 2022 – May 2022	Approval from Institutional Review Board for data collection received from university. Develop and print pre- and post-intervention assessment questionnaire, and obstetric epidural time-out tool. Held an informal information session to obtain study participants, administer pre-intervention assessment questionnaire and discuss the implementation of the DNP project Begin collection of data for the 6 weeks. Administered post-intervention assessment questionnaire to study participants. Transfer all data to UA Box storage account
May – June 2022	Conclusion of data collection; data entered UA Box storage account; all paper tools shredded; compile data and analyze using the nonparametric Wilcoxon Signed Rank test statistic and (SPSS) version 27 software.
June 2022	Dissemination of data via PowerPoint presentation to Obstetric department.
July 2022	presentation to Obstetric department.

Figure 1

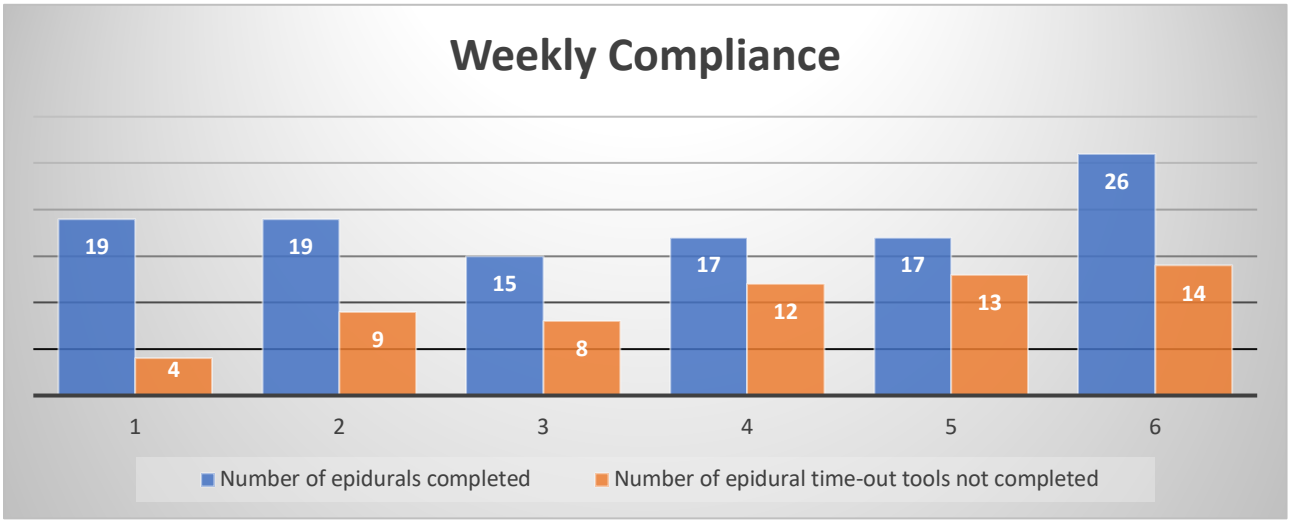
Weekly obstetric epidural time-out tool compliance percentage rate



The obstetric epidural time-out tool rate of compliance with 100% completion of all 10-questions by week.

Figure 2

Completed epidurals versus time-outs not completed weekly



Number of epidurals completed weekly, and number of obstetric epidural time-outs not completed weekly.

Appendix A

Pre/Post intervention assessment questionnaire

	PRE/POST INTERVENTION ASSESSMENT	True	False
1	A time-out is a Joint Commission requirement for non-surgical invasive procedures.	o	o
2	A time-out should be completed prior to an epidural placement.	o	o
3	A time-out is to be performed only for surgical cases in the operating room.	o	o
4	A time-out provides information about your patient's trending vital signs and recent laboratory studies.	o	o
5	A time-out should take less than one minute to complete.	o	o
6	It's acceptable to complete the time-out questions after the patient's epidural is placed, and when the patient is more comfortable.	o	o
7	Anticoagulation status of the patient is a component of the time-out assessment.	o	o
8	Reading the recommended questions during a time-out will increase your confidence in performing a time-out.	o	o
9	A time-out performed prior to an epidural placement will promote patient safety.	o	o
10	A time-out will improve staff communication regarding the patient prior to epidural placement.	o	o

Appendix B

Obstetric epidural time-out tool

OBSTETRIC EPIDURAL TIME-OUT
Read each box, correct if necessary

- ☐ Identify patient: Name/DOB/MRN
- ☐ Consent form for epidural is signed/dated
- ☐ Allergies reviewed/confirmed
- ☐ Monitors on: SpO_2, Blood Pressure is cycling, FHT's traced by OB staff
- ☐ Review any trending vital signs concerns: i.e. Blood Pressure readings, recent fever
- ☐ Procedural/Emergency equipment available including Ambu-bag and suction
- ☐ Anticoagulation Status: Note which medication/ dose administered/last administered
- ☐ Patient medication/labs reviewed including platelet count
- ☐ IV access noted, fluid bolus status, fluids infusing
- ☐ Fire Risk score, use Fire Risk Assessment tool 0-3 (score of 1-2 low-risk, score of 3 high risk)

If there are any questions or concerns with any of the above check boxes in the time-out, the time-out process should be immediately stopped until the discrepancy is resolved.

_____
Date/Time