

**Enhanced Recovery After Surgery (ERAS) for Cesarean Section**

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## **PART I: DNP PROJECT PROPOSAL**

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## Abstract

### Introduction/Purpose

Enhanced recovery after surgery (ERAS) was first utilized in the field of colorectal surgery. Among anesthesia providers it was considered “goal directed fluid therapy”. Combining already proven ERAS protocols, anesthesia considerations, and the obstetric population, protocols for ERAS for cesarean sections have benefited the parturient patients. The purpose of this project was to assess the local anesthesia providers current utilization of ERAS, to implement ERAS of education for the providers, and assess to ERAS understanding after an educational initiative.

### Methods

This was a quality improvement project with pre and posttest to the anesthesia group in obstetrics to evaluate the current utilization level before and after introduction of ERAS protocols/interventions. The survey used with permission was from Pujic’s *A Survey of Enhanced Recovery After Surgery Protocols for Cesarean Delivery in Serbia* to evaluate ERAS utilization.

### Results

An unpaired t-test was used to determine pre and post utilization of ERAS interventions for cesarean sections after an educational intervention. The data was not significantly different ( $p = 0.2488$ ) but survey score averages increased 3.92 points from the pre ( $n=42$ ) to post ( $n=16$ ) surveys indicating an improvement in ERAS utilization overall.

### Discussion

This project sought to increase utilization of ERAS for cesarean sections amongst anesthesia providers. Ultimately, utilization of ERAS for cesarean sections holds the potential to change the practice of current providers at the local facility.

Keywords, such as those below, are words you used to perform database searches for the proposal.

***Keywords:*** Enhanced recovery after surgery, ERAS, cesarean section, ERAS history.

## Enhanced Recovery After Surgery (ERAS) for Cesarean Section

Parturient patients undergoing cesarean sections come to the hospital and hope to go home quickly to take care of their newborn child without pain and complications. Enhanced recovery after surgery (ERAS) programs are evidence-based care pathways designed to decrease the surgical stress response and maximize the potential for recovery. These pathways include the use of multimodal analgesia to reduce opioid exposure, avoidance of prolonged fasting, encouragement of early mobility, and education of patients regarding goals and expectations of surgery (Hedderson et al, 2019). With the use of these different approaches, the parturient can safely leave the hospital and can focus on their own recovery and the health of their child.

### Background

There are limited studies about ERAS in cesarean section (CS) (Hedderson et al., 2019). However, there are studies regarding other types of patients and ERAS that can be extrapolated to the CS population. Patients undergoing total hip replacement who received more than two methods of pain relief in addition to opioids had up to an 18.5% decrease in opioid prescriptions after surgery, 19% fewer respiratory complications, 26% fewer gastrointestinal complications and a 12% decrease in hospital length of stay (ASA, 2018). Considering how patients with hip replacements benefit and transferring this to the parturient, known beneficial ways to discharge the patient sooner and improve patient recovery can be inferred. A benefit of ERAS for cesarean are a decrease in hospital admission length of stay (LOS), improved early ambulation, and early dietary advancement. According to Pujic et al. (2018) in, *A Survey of Enhanced Recovery After Surgery Protocols for Cesarean Delivery in Serbia* the LOS decreased from 3.3 to 2.1 days, and the readmission rate was reduced from 8.3% to 3.3%. The hours to first postsurgical ambulation decreased by 2.7 hours (95% CI -3.1 to -2.4) and the hours to first postsurgical solid intake decreased by 11.1 hours (95% CI -11.5 to -10.7) (Pujic et al., 2018). There is potential for an improvement in patient satisfaction for those who require

anesthesia engaged in ERAS protocols. Anesthesia providers are recommended to routinely give intrathecal opioids followed by acetaminophen and nonsteroidal anti-inflammatory drugs (NSAIDs) every 6 hours, or four times daily (Hedderson et al., 2019). Those slight implementations assist in improving patient satisfaction and result in patients recommending ERAS to others undergoing CS or choosing it in the future for a repeat CS (Pujic et al., 2018).

### **Problem Statement**

Around 43% of the hospital laboring patients undergo CS at the local facility according to the labor and delivery nurse manager (J Withers, April 27, 2022). Anesthesia providers can facilitate an improved recovery after surgery and promote satisfaction with the hospital stay through ERAS protocols (Pujic et al., 2018). Some maternity centers are endeavoring to use ERAS protocol in their clinical practice, showing potential advantages over conventional care in CS (Meng, 2021).

### **Organizational “Gap” Analysis of Project Site**

ERAS implementation was associated with significantly reduced inpatient opioid exposure with improvement in the proportion of time patients reported their pain as acceptable and had no association with postoperative complication rates. (Hedderson et al., 2019). The anesthesia leadership and women’s services at the local facility has no ERAS for cesarean sections and the patient population cannot benefit from the great outcomes that Hedderson et al. (2019) discusses (C. Harris, personal communication, April 26, 2022; J. Weathers, personal communication, April 26, 2022). Currently, the anesthesia staff and the labor unit have no rules in place for ERAS after cesarean. Each individual anesthesia provider determines what the patient receives per anesthesia leadership (B. Koonce, personal communication, April 29, 2022). Without a basic standard provided, the anesthesia staff are not treating the patients in the demonstrated best practice as described by Hedderson et al. (2019). The patients would benefit from effective education and acceptance, good perioperative hydration and nutrition, use of surgical techniques associated with faster patient recovery,

maintenance of perioperative patient normothermia, early removal of urinary catheters, adequate pain relief that promotes early ambulation and minimal use of perioperative opioids (Pujic et al., 2018). Implementing clear guidelines for all providers for ERAS after a cesarean section will help eliminate these gaps in care for this patient population.

### **Review of the Literature**

A literature search was executed to gather relevant evidence and current, best practices for ERAS for patients undergoing cesarean sections. The last six (2016-2022) years were used to focus on most recent data. PubMed was the database used provided by the University of Alabama. The search strategy included “ERAS cesarean, Enhanced recovery after surgery, ERAS, cesarean section, ERAS history” and resulted 54 articles. Free full text was also applied which narrowed it down to 14 articles. Two articles were eliminated based on relevance to the current project. Twelve articles were then reviewed as follows.

*Multimodal Approach to Pain Management Reduces Opioid Use, Prescriptions After Joint Replacement* by the American Society of Anesthesiologists (ASA, 2018) informs us of the use of multimodal techniques rather than just opioid use alone in patients undergoing total knee or total hip replacements. Researchers used Premiere Perspective, a nationwide database that includes information on joint replacement surgeries performed at 546 hospitals, to examine types of analgesics (pain relievers) used between 2006 to 2016 in 512,393 hip replacement and 1,028,069 knee replacement patients (ASA, 2018). Patients undergoing total hip replacement who received more than two methods of pain relief in addition to opioids had up to an 18.5% decrease in opioid prescriptions after surgery, 19% fewer respiratory complications, 26% fewer gastrointestinal complications and a 12% decrease in hospital length of stay, compared to patients receiving opioids alone (ASA, 2018). Although this article is pertinent to total joint procedures, we can infer this information would also be beneficial in cesarean sections as use of spinal opiates, peripheral nerve blocks, non-steroidal anti-inflammatory drugs (NSAIDs), cyclooxygenase-2 (COX-2) inhibitors,



gabapentin/pregabalin, ketamine, and acetaminophen. The literature review from this article demonstrates different multimodal approaches as well as the benefits of multimodal analgesia.

*Enhanced Recovery After Surgery to Change Process Measures and Reduce Opioid Use After Cesarean Delivery: A Quality Improvement Initiative* by Hedderson et al. (2019), builds on what the ASA (2018) stated and ties it into the obstetric population. Medical research consultants in Kaiser Permanente Northern California developed an ERAS care pathway for patients undergoing cesarean delivery based on prior ERAS efforts targeting other surgical populations (Hedderson et al., 2019). They discuss education with anesthesia staff and surgical staff knowledge prior and after implementation of education. The PI will use this information of the knowledge before and after implementation of education that showed an increase in knowledge after. Hedderson et al's. (2019) study identified lack of information and lack of time as the most significant barriers to gaining knowledge about ERAS. Evaluating current anesthesia staff, will prove beneficial in advancement of ERAS for CS. The perception and knowledge of providers, in addition to the preferred methods of learning and barriers, was critical to identifying opportunities for further engagement and information sharing (Hedderson, 2019). This will improve education and awareness of ERAS.

*A Survey of Enhanced Recovery After Surgery Protocols for Cesarean Delivery in Serbia* by Pujic et al. (2018) is a mix between different hospitals and head of anesthesia and obstetrics. The same survey will be used in this project. It was approved by the Ethical Committee at the Clinical Center of Vojvodina. Neuraxial anesthesia was used in 46% of elective CS in ERAS hospitals compared to 9% in non-ERAS hospitals ( $P < 0.01$ ), and neuraxial narcotics for post CS analgesia are given more often in ERAS hospitals. Thirty-six percent% of ERAS patients are discharged within 3 days versus none in the non-ERAS group (Pujic et al., 2018). For this article, it was beneficial in Serbia to distinguish CS hospitals with ERAS implemented versus CS hospitals where ERAS has not been implemented. Evidence demonstrates early discharge in Serbia within three days. The local facility allows discharge within 24 hours if the patient expresses a wish to leave

as soon as possible, or 36 hours if everything goes well with the mother and baby. Federal law in the United States requires insurance companies to pay for CS patients to stay for 96 hours but a patient may elect to leave earlier if desired (National Conference of state Legislatures, 2018)

*The Advantage of Implementation of Enhanced Recovery After Surgery (ERAS) in Acute Pain Management During Elective Cesarean Delivery: A Prospective Randomized Controlled Trial (Pan, 2021)* compared an ERAS group to a controlled group. The ERAS group had significantly fewer patients with intraoperative nausea, pain of visual analog scale (VAS) scores, and VAS grade >3 during rest in the first 24 hours and during motion in the first 24 and 48 hours after surgery. There were no intergroup differences in the requirement of extra analgesics, the incidence of vomiting, shivering, hypotension, postoperative nausea, and pruritus. None of the patients in either group had postoperative vomiting. Patient satisfaction rated as per the VAS was significantly higher in the ERAS group than in the control group. The total length of stay, postoperative length of stay, and the cost of anesthesia in both groups were comparable (Pan, 2020). This is a look at multiple areas of healthcare being affected by ERAS implementation.

*The Successful Implementation of the Enhanced Recovery After Surgery (ERAS) Program Among Cesarean Deliveries in Bhutan to Reduce the Postoperative Length of Hospital Stay (Tamang, 2021)* focused on decreasing LOS. LOS decreased by an average of 21.0 (CI 16.11–24.64; p-value < 0.001) hours in the postoperative period (Tamang, 2021). This supports ERAS to decrease LOS in CS patients.

*Fast-track Pathway for Elective Cesarean Section: A Quality Improvement Initiative to Promote Day 1 Discharge (Bowden et al. 2019)* supports implemented ERAS in elective CS to increase one-day discharges. Overall, 76.2% (77/101) of women were discharged on day one. Mean duration of admission was 1.31 days (SD 0.80). This compares with a mean of 3.25 days (SD 0.45) (19.2%-day 1 discharge) program at baseline (Bowden et al., 2019).

*Enhanced Recovery After Elective Cesarean: A Rapid Review of Clinical Protocols, and an*

*Umbrella Review of Systematic Reviews* (Corso et al. 2017) stated five primary ERAS protocol to decrease LOS. A minimally invasive Joel-Cohen surgical technique, early catheter removal and post-operative antibiotic prophylaxis reduced LOS after CS most significantly by around half to one and a half days compared to early oral intake, mobilization and removal of urinary catheter which produced low data (Corso et al., 2017). This article does give a comparison of the effect of different implementations on ERAS recovery.

*The Clinical Efficacy and Safety of Enhanced Recovery After Surgery for Cesarean Section: A Systematic Review and Meta-Analysis of Randomized Controlled Trials and Observational Studies* shows multiple ways ERAS has benefited CS. ERAS was associated with a decreased LOS (WMD  $-7.47$  h, 95% CI:  $-8.36$  to  $-6.59$  h,  $p < 0.00001$ ) and lower incidence of postoperative complications (RR: 0.50, 95% CI: 0.37 to 0.68,  $p < 0.00001$ ). Moreover, pooled analysis showed that postoperative pain score (WMD:  $-1.23$ , 95% CI:  $-1.32$  to  $-1.15$ ,  $p < 0.00001$ ), opioid use (SMD:  $-0.46$ , 95% CI:  $-0.58$  to  $-0.34$ ,  $p < 0.00001$ ), and hospital cost (SMD:  $-0.54$ , 95% CI:  $-0.63$  to  $-0.45$ ,  $p < 0.00001$ ) were significantly lower in the ERAS group than in the conventional care group (Meng, 2021).

*Enhanced Recovery After Surgery Protocol and Postoperative Opioid Prescribing for Cesarean Delivery: An Interrupted Time Series Analysis* (Langnas, 2021) focused purely on opioid administration. After ERAS implementation, 80.72% received a discharge opioid prescription vs. 95.36% at baseline. Pre-ERAS daily oral morphine equivalents (OME) on the discharge prescription decreased by 0.48 OME each month ( $p < 0.01$ ) (Langnas, 2021).

*The Impact of Oral Carbohydrate-Rich Supplement Taken Two Hours Before Caesarean Delivery on Maternal and Neonatal Perioperative Outcomes -- A Randomized Clinical Trial* (He, 2021) is slightly different from most of the review of literature. It only focused on a carbohydrate drink with no other intervention. Women who drank Ch-R supplement had lower postoperative insulin level ( $\beta = -3.50$ , 95% CI

– 5.45 to – 1.56), as well as postoperative HOMA-IR index ( $\beta = -0.74$ , 95% CI – 1.15 to – 0.34), compared with women who had fasted. Additionally, neonates of mothers who were allocated in the Ch-R group also had a higher glucose level (He, 2021). ERAS for CS articles studies have been primarily focused on the mother, while this article shows benefit for mother as well as the baby.

*Quality Improvement Initiative to Address Bed Shortage in the Maternity Ward at the National Referral Hospital* (Tshering et al., 2022) aimed at discharging patients earlier by using ERAS for CS to have more room available for the next mother. This quality improvement (QI) project was conducted to mitigate the problem of bed shortage by implementing modified enhanced recovery after surgery in low-risk cesarean section mothers. This study goal was to increase the process measure of second day postoperative discharge (Tshering et al. 2022).

*Patient Anxiety on Day 0 After a Cesarean Section* (Prokopiwicz, 2021) finds that ERAS protocols such as multimodal analgesic therapy allows for maximum reduction of pain. This article recommends fast mobilization of a patient along with providing psychological comfort through ERAS; however, noting that early verticalization can generate mental discomfort (Prokopiwicz, 2021). The multimodal approach in this article does not benefit the patient mentally in preparing for the pain post conduction anesthesia (spinal).

A common theme for many of these articles is that ERAS protocols are beneficial to patient satisfaction and a decrease in hospital LOS. Some articles have one focus such as introducing a carbohydrate drink, opioid administration, or decreasing LOS. Also noted, there is minimal information regarding ERAS primarily for CS. The articles reviewed generally focus on increasing knowledge of ERAS for CS to benefit both the mother-baby dyad and the discharging facility.

### **Evidence-based Practice: Verification of Chosen Option**

The PICOT question for this project was as follows: Will education about ERAS for anesthesia providers improve provider utilization of ERAS over an 8-week period compared to preintervention levels? A

quality improvement project was the option chosen as there is no current ERAS for CS at the hospital. Pre and posttest of the anesthesia providers utilization was assessed with a questionnaire. According to Beal (2021), providers were most interested in learning about multimodal pain management and minimizing perioperative complications, and generally preferred to learn by direct participation in institutional protocols, rather than by participating in seminars and lectures on this topic from local or national leaders or reviewing the literature independently. Direct education to introduce the protocols to the anesthesia providers was chosen as the most effective means of promoting ERAS adoption in this group.

### **Theoretical Framework or Evidence-based Practice Model**

A Plan, Do, Study, Act (PDSA) was the quality improvement approach that guided the project. The model included three focus questions:

1. What are we trying to accomplish?
2. How will we know that a change is an improvement?
3. What changes can we make that will result in improvement (Moran,2020)?

In order to accomplish this project, it was necessary to assess the providers current utilization of ERAS protocols for CS. A change in utilization was seen when the pre and posttest were completed and compared to one another. An improvement noted if there was an increase utilization of ERAS into practice after education. Education about the protocol for ERAS in CS patients resulted in improvement in the utilization of ERAS for CS.

### **Goals, Objectives, and Expected Outcomes**

The goal of this project aimed to improve the anesthesia department utilization of ERAS protocols.

The objectives the primary investigator (PI) carried out were:

1. Presurvey to assess anesthesia utilization of ERAS, refer to Table 1.
2. Three Wednesday morning meetings from 0600-0630 to educate staff on evidence and use of ERAS

protocols for CS. Having limited opportunities to present the project implementation during a weekly Wednesday meeting as anticipated, this barrier was mitigated by preparing a “YouTube video” that was presented to staff on a group work app. A handout was also left in the break rooms as a physical handout of ERAS for cesarean education.

3. Posttest to assess anesthesia current utilization 8 weeks after the educational sessions were completed.
4. Evaluated the effectiveness of education through postsurvey indicating anesthesia staff were implementing education into practice (Table 1).

The expected outcomes were that the anesthesia department would increase utilization of ERAS protocols that would ultimately support implementation of the protocols resulting in improved patient satisfaction and improved maternal outcomes.

### **Setting Facilitators and Barriers**

From the staff that was educated, the Resident Registered Nurse Anesthetists (RRNAs) were the easiest group to educate and take each survey. They were also the group with the most respondents. The PI was able to have morning meetings with them, provide in person education along with video/handout, and verbally ask them to take each survey. It seems as if the levels of education of the staff increased participation decreased. The MDAs were the hardest group to educate. The PI not being allowed a meeting by the chief MDA and lack of prequestionnaire and postquestionnaire survey completion furthers supported the claim. The overall biggest barrier was lack of opportunity to present in person during a weekly meeting. As seen with the RRNAs, it was almost complete participation because of that in person education/opportunity.

### **Methods (Plan)**

#### **Project Design**

The project utilized a pre and postsurvey assessment of the anesthesia group’s utilization of ERAS for cesarean sections. This was an educational intervention and a practice intervention also known as a

quality improvement project. The difference of pre and post utilization and staff implementation with parturient patients was determined.

### **Project Site and Population**

The project site was an Anesthesia Provider group at a Texas level 1 county facility. The project participants are the anesthesia department providers. The services provided by this staff are to the main operating room as well as labor and delivery. The providers see patients in pre-admissions testing, perioperative, intraoperative, and postoperative locations. The population consists of Anesthesiologist, Certified Registered Nurse Anesthetists, and Resident Registered Nurse Anesthetists. Recruitment strategies were on a volunteer basis with plan for 75% of staff participation. Exclusion criteria was any labor staff not employed by the anesthesia group.

### **Measurement Instruments**

The instruments to measure the anesthesia providers utilization was a pre and post survey with the questionnaire utilized in Pujis et al. (2018) which is not open access. The PI obtained permission to use the questionnaire listed in Appendix A. The providers had the decision to participate or to not participate. The questionnaire was gathered pre intervention and eight weeks post intervention. The questionnaire answers were assigned a value based on their correlation with ERAS protocol compliance. Higher scores were associated with higher utilization of ERAS protocols. The scores were reviewed and analyzed against each other. The questionnaire consisted of 22 questions about current practice of ERAS for CS. (See Appendix A). The survey was taken from Pujic's *A Survey of Enhanced Recovery After Surgery Protocols for Cesarean Delivery in Serbia*. The 22-questionnaire was not tested for validity or reliability. However, it was administered to 46 hospitals with a response from 43 of the hospitals. The data in the original survey was evaluated using a Pearson Chi Square to compare those with ERAS protocols and those without. Pearson' Chi Square test was used where appropriate for comparisons between groups in the prospective observational study (R version

3.3.3, R Core Team, R Foundation for Statistical Computing). Differences of  $P \leq 0.05$  were considered significant (Pujic, 2018).

### **Data Collection Procedures**

Plan-Do-Study-Act (PDSA) is a four-stage model that was the framework used for the project. Planning is done during the preintervention phase (Appendix B). The PI “Planned” the presurvey test to be done regarding current utilization of ERAS for CS. The “Do” was be done during the intervention phase. This consisted of educating the anesthesia provider and the gathering of survey information. As the PI gathered the survey, the PI started the “Study” phase. The PI separated the staff into anesthesiologist, Certified Registered Nurse Anesthetist (CRNA), and RRNA. The PI did this twice, once with the presurvey, once with the postsurvey. During the post invention phase or the “Act” phase, the PI evaluated and disseminated the results. If it does not improve utilization, the PI will redo the PDSA which is an advantage of the framework.

### **Data Analysis**

Analysis of the information was from the survey from Pujic’s et al. (2018) *A Survey of Enhanced Recovery After Surgery Protocols for Cesarean Delivery in Serbia*. The PI collected and provided the questionnaire just prior to the educational session, using a link on the providers phone to answer the questions. The questionnaire was redistributed for completion eight weeks after the educational sessions. The surveys were scored quantitative data. Each survey answer received points based on their adherence to ERAS protocols on the presurvey as well as the postsurvey. The surveys were scored, and the differences were compared via independent t test. The PI analyzed and compared the data. Descriptive statistics were also collected. There was no total limit and no minimum limit of surveys delivered. Utilization of an independent t test negated the need for, the participant to complete a presurvey prior to completing a postsurvey.

### **Cost-Benefit Analysis/Budget**



There was no cost for the project surveys. The University of Alabama (UA) provided Qualtrics® for security purposes. If other materials were needed, the PI paid for or provided them. Because ERAS for CS has proven to decrease the hospital LOS, the patient could potentially decrease their bill and the hospital could increase the number of deliveries and revenue by discharging patients quickly. The cost of extra narcotics would be decreased, and the amount dispensed would also decrease. The use of narcotics leads to slow gastrointestinal motility, which could also increase cost. Having the patient's foley catheter discontinued and the patient ambulating earlier has potential to decrease urinary tract infection which is part of the health care associated infections (HAI) (CDC, 2015). Among UTIs acquired in the hospital, approximately 75% are associated with a urinary catheter. The most important risk factor for developing a catheter-associated UTI (CAUTI) is prolonged use of the urinary catheter. Therefore, catheters should only be used for appropriate indications and should be removed as soon as they are no longer needed (CDC, 2015). The average cost of a HAI CAUTI is \$13,793 (CDC, 2022).

### **Timeline**

The timeline for the total project was 12 months. This began with the proposal approval and continued through implementation, data collection, data analysis and interpretation of outcomes, and dissemination of findings. The PI administered the presurvey just prior to the educational sessions. The ERAS educational sessions spanned a total of three weeks. The PI allowed an eight-week wash out phase prior to the administration of the postsurvey. The data analysis occurred over a month period followed by up to eight months of anticipated dissemination.

### **Ethical Considerations/Protection of Human Subjects**

The University of Alabama (UA) Institutional Review Board (IRB) approval was obtained prior to initiating the project. Support and approval were also be obtained from the leader of the clinical site. Any anesthesia staff that was willing to participate was kept confidential. No names or employee identification

numbers were used. There was minimal risk that participants would be identified through selection of profession in the demographic section of the survey. All electronic data was on UA Box. All information was permanently deleted and destroyed after project completion. Also, with completion of graduation, the PI will no longer have access to UA Box or Qualtrics®.

## Results

The survey from Pujic's *A Survey of Enhanced Recovery After Surgery Protocols for Cesarean Delivery in Serbia* (2018) was utilized as the preintervention assessment survey and the post intervention assessment survey questionnaire to determine if there was an increase in ERAS utilization. The participants were RRNAs, CRNAs, and Medical Doctor Anesthetists (MDAs). The anesthesia providers would be the ones to increase utilization of ERAS for cesarean. This would increase patient satisfaction, lead to a speedier discharge, and less narcotic use for the patients.

There were a total of 87 anesthesia provider (RRNAs, CRNAs, MDAs) that participated. Fifty-eight of the eighty-seven completed the questionnaire with minimal to no omitted questions. Surveys with only four or less responses were excluded. There were 42 anesthesia providers that participated and completed the preintervention survey. Of those 42 anesthesia providers, the presurvey mean score was 37.45 (SD 12.00). There were 16 anesthesia providers that participated and completed the post intervention survey with minimal to no omissions. The mean score was 41.37 (SD 9.83) (P 0.2488). The mean increase of the post questionnaire was -3.92 with a 95% confidence interval of this difference.

Regarding each question asked, scores either improved, declined, or stayed the same after education. Areas that showed improvement were prophylactic antibiotic use, regional anesthesia for emergent CS, intrathecal opiates, intravenous infusion, post operative ambulation, active warming, and medication to prevent chronic pain. Areas that showed a decline were: who informs the patient, regional anesthesia for scheduled CS, analgesia following CS, chewing gum, skin to skin, and intraoperative temperature checks.

Gum chewing and medications to prevent chronic pain scored the lowest of all interventions on both pre and post survey. Some interventions remained unchanged were patients admitted prior to CS, bowel preparation before CS, oral intake after CS, foley catheter was removal, and patients time to discharge after CS.

### **Interpretation/Discussion**

The goal of this quality improvement project was to determine if an increase in utilization of ERAS for CS was demonstrated between a preintervention survey, and a postintervention survey assessment using a survey from Pujic's *A Survey of Enhanced Recovery After Surgery Protocols for Cesarean Delivery in Serbia* (2018) after implementation of education regarding ERAS for CS. Data was collected with the pre survey and post survey following the educational intervention after an 8-week period. The results were not statistically significant but there was clinical significance. The postsurvey did demonstrate that an increase in education increased the utilization of ERAS for cesarean.

A simple solution to the areas that declined are for the anesthesia provider, during admission, to talk to the patients about ERAS and then give the patient some gum. The anesthesia provider is also the one checking intraoperative temperature checks, providing the regional anesthesia for scheduled CS, facilitating skin to skin, and prescribing analgesia following CS. Through one provider, the areas that declined could show improvement. Future focus on these areas will facilitate improvement.

Limitations to this study included having limited opportunities to present the project implementation during a weekly Wednesday meeting as anticipated. The chief anesthesiologist already had an agenda planned for many weeks ahead resulting in limited access to the meeting. This barrier was mitigated by preparing a "YouTube video" that was presented to staff on a group work app. A handout was also left in the break rooms as a physical handout of ERAS for cesarean education. An additional limitation was that only 58 participants fully completed the surveys out of 87 attempted results. This limitation excluded surveys that were minimally

completed. One could interpret a larger increase in ERAS utilization if this was not the case.

For future research, planning far enough in advance with the correct staff to do the education at the weekly meetings would allow for comparison of in person education to the video/flyer education results. Prior agreement for weekly meetings were made with the chief CRNA. In an effort not to have the same issues again, an agreement would be made with the chief MDA. In order to get full participation, Qualtrics® would be set to not accept a survey if it was not 100% completed. It would force a participant to complete the missing questions before submission is possible. Finally, the surveys provided valuable information regarding areas needing further education and improvement.

### **Conclusion**

Education about ERAS for anesthesia providers improved provider utilization of ERAS eight weeks after the intervention at the local level 1 county facility with a high cesarean rate. The PI implemented a PDSA led project with fifty-eight participants from one local anesthesia group. At the end of the project, because of the educational sessions given, anesthesia practitioners did demonstrate, understand, convey, and implemented ERAS into clinical practice.

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Table 1

**1. Is the ERAS protocol for better and faster recovery after cesarean section introduced to the parturients in your institution?**

A. Yes B. No C. Sometimes D. \_\_\_\_\_

**2. Who informs the parturients preoperatively?**

A. Obstetrician who takes care during the pregnancy B. Obstetrician who perform CS C. Anesthesiologist in anesthesia clinic D. Anesthesiologist who perform anesthesia for CS E. \_\_\_\_\_

**3. In your hospital is usual patient's admission prior CS?**

A. Evening before schedule surgery B. 24 h before C. In the morning, on the surgery day D. \_\_\_\_\_

**4. In your institution do you use bowel preparation before CS?**

A. Yes B. No C. Sometimes D. \_\_\_\_\_

**5. In your institution do you use antibiotics prophylaxis 30' before CS?**

A. Always B. Sometimes C. Never D. \_\_\_\_\_

**6. In your institution do you use DVT prophylaxis before or after CS?**

A. Always B. Sometimes C. Never D. \_\_\_\_\_

**7. What is the percentage of regional anesthesia (RA) for scheduled CS in your institution?**

A. <10% B. 10–29% C. 30–49% D. >50%

**8. What is the percentage of RA for emergent CS in your institution?**

A. <10% B. 10–29% C. 30–49% D. >50%

**9. Do you use opiates intrathecal for postoperative analgesia (morphine)?**

A. Always B. Sometimes C. Never D. \_\_\_\_\_

**10. Analgesia following CS is:**

A. IV B. IM C. combination (IV and IM) D. per oral E. \_\_\_\_\_

**11. How long parturients are on the IV infusion?**

A. < 24 h B. 24 h C. 48 h D. Depends on case E. \_\_\_\_\_

**12. When do you start with per oral liquids intake?**

A. Immediately postoperative B. Following 12 h C. Following 24 h D. Following 48 h

**13. When do you start with per oral food intake?**

A. Following 12 h B. Following 24 h C. Following 48 h D. \_\_\_\_\_

**14. Do you use chewing gum following CS?**

A. Yes B. No C. Sometimes

**15. When do they start walking after CS?**

A. In the evening (On the day of CS) B. Tomorrow morning (following 24 h) C. Following 48 h D. \_\_\_\_\_

**16. When do you remove urinary catheter following CS?**

A. On the day of CS B. Tomorrow C. Following 48 h D. Depends of case

**17. Do you use "skin to skin" contact on the operating table?**

A. Yes B. No

**18. Do you use temperature checking intraoperative?**

A. Yes B. No

**19. Do you use active warming during CS?**

A. Yes B. No C. Sometimes

**20. Do you use medication to prevent chronic pain (gabapentin or pregabalin)?**

A. Yes B. No C. \_\_\_\_\_

**21. How many CS do you have at your hospital per year?**

A. <500 B. 501–1,000 C. >1,000

**22. How long are parturients at the hospital following CS before discharge home?**

A. <3 days B. 4–6 days C. >6 days



## Appendix A

[EXTERNAL] Re: Can I use survey in article



Borislava Pujic <borislava60@yahoo.com>

7/26/2022 2:23 PM



To: Keiston Bennett

Dear dr Benett,

You can use this questionnaire, of course!

Borislava Pujic

[Sent from Yahoo Mail for iPhone](#)

On Tuesday, July 26, 2022, 20:23, Keiston Bennett <kfbennett@crimson.ua.edu> wrote:

Good afternoon,

I was emailing you to see if I can use the 22 question survey in *A Survey of Enhanced Recovery After Surgery Protocols for Cesarean Delivery in Serbia*. I am doing a doctoral project on ERAS for cesarean and it is leaning toward education towards providers. I would be more than excited if you allowed me to do so.

Thank you

Keiston Bennett

Sent from [Mail](#) for Windows

