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Implementation of Obstetric Enhanced Recovery After Surgery (OB ERAS)

Protocol: Prenatally Through Transition To Community

by

Emily Corbett

A thesis project submitted to the faculty of
Gardner-Webb University Hunt School of Nursing
in partial fulfillment of the requirements for the
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Abstract

This project discusses the implementation of Obstetric Enhanced Recovery after surgery (ERAS) protocol for cesarean section patients scheduled or emergent. The goal of this project was to ensure the best possible outcomes from surgery for obstetric patients by decreasing surgical site infection rates in order to decrease maternal mortality rates. It provides protocols preoperatively, intraoperatively, and postoperatively for surgical procedures. Key steps take place in each phase of surgical care to impact patient outcomes. The protocol includes shorter NPO times, decreased surgical stress through multi-modal approaches for pain and nausea, early mobility, and reduces the length of stay. OB ERAS protocol decreases surgical site infections, decreases maternal mortality rates, and increases patient experiences.

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CHAPTER I

Introduction

Surgical site infections that occur after a cesarean section are associated with increased maternal morbidity, prolonged hospital stay, and increased medical costs (Jasim et al., 2017). Implementing an obstetrical enhanced recovery after surgery (ERAS) protocol achieves a reproducible improvement in the quality of care (Ituk & Habib, 2018). Cesarean section procedures in the United States consist of approximately 32% of all births, therefore this protocol can potentially improve 1.27 million future patient outcomes (Ituk & Habib, 2018).

Problem Statement

Surgical site infection (SSI) after cesarean sections is related to increased maternal morbidity, prolonged hospital stay, and increased medical costs (Jasim et al., 2017). Risk factors for SSI in relation to cesarean sections include age, factors such as type of cesarean section (elective versus emergency), and patient care practices such as antibiotic prophylaxis (Leapfrog Hospital Survey, 2021). Health risks to women undergoing a cesarean delivery include increased rates of infection, hemorrhage, and hospital readmission (Hoyert & Minino, 2020). According to the Centers for Disease Control (CDC) National Center for Health Statistics (NCHS) (2019), the following are risk factors and causes for pregnancy-related deaths between 1987 and 2013: hemorrhage 11%, infection or sepsis 12.5%, amniotic fluid embolism 5.6%, thrombotic pulmonary or other embolism 9%, hypertensive disorders of pregnancy 6.9%, anesthesia complications 0.3%, cerebrovascular accidents 7.7%, cardiomyopathy 11%, other cardiovascular

accidents 15.7%, other non-cardiovascular medical conditions 13.9%, and unknown cause of death 6.4%.

Significance

According to the National Center for Health Statistics (NCHS), in 2018, women in the United States gave birth to 3,791,712 babies (Martin et al., 2019). Among women who delivered babies in 2018, 658 maternal deaths occurred as a result of pregnancies alone (Hoyert & Minino, 2020). The national maternal mortality death rate for 2018 was 17.4 deaths per 100,000 live births (Hoyert & Minino, 2020). According to the CDC National Vital Statistics Report (November 9, 2020), the cesarean rate for 2018 was 31.9%. Incidence rates of SSI range from 3-15 % depending on the surveillance methods used to identify infections, the patient population, and the use of antibiotic prophylaxis (Jasim et al., 2017).

Purpose

The purpose of this project was to decrease the surgical site infection rates in women undergoing cesarean deliveries in order to decrease maternal mortality rates (Wilson et al., 2018). This can be accomplished by implementing the Enhanced Recovery after Cesarean delivery protocol (ERAS). A collaborative team should be established to make implementation successful. The team should consist of anesthesia, obstetrical physicians, nursing educators, obstetrical (OB) nursing leaders, and OB surgical team members such as labor and delivery bedside nurses and postpartum nurses. This project setting has an ERAS Clinical Nurse Leader that will head up the implementation team.

In North America, the most common diagnosis to be admitted into the hospital is childbirth and the most common surgery among women of childbearing age is cesarean

section delivery. A Cesarean section procedure increases the risk of infection and its related morbidity five to 20-fold compared to vaginal delivery (Ituk & Habib, 2018). Obstetric-related infectious morbidity and mortality is a national and global problem. A multidisciplinary approach to following an evidence-based surgical site infection bundle has been proven to decrease this risk significantly. ERAS improves patient outcomes and saves resources (Wilson et al., 2018).

Theoretical Framework

The theoretical framework used for this project was King's Theory of Goal Attainment, developed by Imogene King. The nurse and patient work together to make and reach goals that are set. It is a conceptual framework of three interacting sets of systems (personal, interpersonal, and social systems). The first set of systems is the personal system. This is made up of the individual nurse and individual patient. The second set of systems is the interpersonal system or groups. This includes interactions with the nurse, patient, and immediate family members such as a spouse, daughter/son, or support person. The third set of systems is the social systems or societies. This may include a religious organization or churches, universities, and hospitals. One example of the third set of systems is when a patient comes to the hospital for pre-operative teaching from the nurse to prepare for a surgical procedure. The nurse and patient work together to reach a common goal of having the best outcome for the patient from having the procedure.

King's theory can be applied to this project of implementing the ERAS protocol to decrease infection rates in cesarean sections. The protocol involves the nurse giving one-on-one verbal and written instructions to the patient. The instructions include steps

preoperatively, intraoperatively, and postoperatively for the patient and immediate family members to follow. Then lastly, the hospital is the site for the surgery to take place and continue the ERAS protocol set until the patient is discharged home from the hospital. By the nurse, patient, and immediate family members forming a relationship prior to the surgery and setting goals and steps to be taken by all, this decreases complications such as infection rates, complications from surgery, and ultimately morbidity and mortality.

The following is a case study example of how King's theory can be applied to OB ERAS protocol. The first step of the conceptual system is personal interaction. With OB ERAS this begins with the surgeon's nurse introducing the OB ERAS concept to the patient one-on-one in the physician office setting. The registered nurse meets with the patient once it is determined by the physician the patient will have a scheduled cesarean section. An OB ERAS educational booklet is given to the patient to study, read, and ask questions on the next office visit. The ERAS goal is communicated to the patient which is to help the patient recover quicker and to reduce infection risk. There is a team approach to provide the patient with the best care by helping to lessen pain and nausea, to improve mobility, and to encourage eating and drinking soon after the cesarean section procedures.

The second step of the conceptual system would be interpersonal interaction. This step involves small groups such as the patient having the cesarean section and her support person. The nurse will meet with both the patient and the support person to explain the OB ERAS goal, which is for mothers to return to a healthy state after their cesarean section surgery. The nurse will explain how the support person can be involved in the patient's care. The support person can encourage healthy eating with plenty of fruits,

vegetables, and protein to get the patient's body ready for surgery. The support person can help by reminding their loved one about clear liquids only after midnight before the day of surgery. After bathing with Dial™ soap the night before surgery, clean pajamas and sheets need to be prepared for the patient. The support person will encourage and help the patient after surgery to move as much as possible. Walking frequently after surgery helps the patient have less pain and soreness and will help them go home sooner.

The third step of the conceptual system is social interaction. OB ERAS protocol contributes to the new mother getting back into normal social interactions quicker with better recovery outcomes. A new mother can feel isolated due to the infant requiring 24-hour attention and care. Social re-integration into society is important for new mothers. As a new mother, schedules may require adjusting, social circles may look different, and priorities are focused on positive family social interactions.

Definition of Terms

Several terms will be utilized throughout this project and need to be clearly defined. Surgical site infection (SSI) is defined by the Centers of Disease Control (CDC) as an infection that occurs after surgery in the part of the body where the surgery took place. ERAS or Enhanced recovery after surgery is a protocol implemented by the surgical team to help ensure a patient has the best outcome possible from their surgical procedure. This protocol has action items that occur before, during, and after the surgical procedure takes place. Cesarean section is a surgical procedure used to deliver a baby through incisions made in the abdomen and uterus. Maternal mortality, according to the World Health Organization (WHO), is the death of a woman while pregnant or within 42 days of termination of pregnancy from any cause related to or aggravated by the

pregnancy or its management but not from accidental or incidental causes. Pregnancy-related mortality ratio is an estimate of the number of pregnancy-related deaths for one in every 100,000 live birth. This ratio is used as an indicator to measure the nation's health. CDC defines pregnancy-related deaths as a death of a woman while pregnant or within 1 year of the end of pregnancy-regardless of outcome, duration, or site of the pregnancy-from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Prophylactic antibiotic therapy is the administration of antimicrobials in the absence of a known infection. Normothermia is a body temperature that is $>36-38$ degrees Celsius to balance heat reduction and loss (Dieplinger et al., 2020). Lastly, quality improvement is the science of process management (Wilson et al., 2018).

CHAPTER II

Literature Review

A literature review was performed by searching in various databases and search engines from the 2012-current year. These databases included ProQuest, Sage Premier, and PubMed using the search engine Google. Key terms for the search included enhanced recovery after surgery, cesarean delivery, and surgical site infection. There was a review of 20 articles and then narrowed down to those most pertinent to implementing this project

Literature Related to Problem Statement

Literature indicates that enhanced recovery after surgery protocols followed preoperatively, intraoperatively, and postoperatively in a cesarean section procedure, improves the quality of care and patient outcomes. Evidence included following a care pathway and specific component interventions to improve patient outcomes. According to Ituk & Habib (2018), delivering by cesarean, increases the risk of infection five to 20-fold compared to delivering vaginally. There are more than 1.27 million cesarean sections performed each year (Ituk & Habib, 2018).

Recommendations

A few preoperative steps that ERAS recommends are patient education and shared decision-making for higher success and intake of a high-calorie carbohydrate drink up to 2 hours before surgery (shown to reduce preoperative thirst, hunger, anxiety, and reduces insulin resistance) (Ituk & Habib, 2018). Enhanced recovery after surgery intraoperatively recommends administration of prophylactic antibiotic 60 minutes prior to skin incision to reduce the incidence of maternal postpartum infection compared to

antibiotic administration after cord clamping, using pneumatic compression devices, temperature management, and neuraxial anesthesia including neuraxial opioids for analgesia (Ituk & Habib, 2018).

Postoperatively, ERAS recommends early oral intake (promotes the return of bowel function), early ambulation (improves pulmonary function, tissue oxygenation, improves insulin resistance, reduces risk of thromboembolism, and shortens length of stay). Early removal of the urinary catheter within 7 hours of the surgical procedure is also recommended in the ERAS protocol to facilitate early ambulation. These actions can potentially expedite recovery and patient comfort in the post-operative period.

According to Wilson et al. (2018), ERAS improves patient outcomes and saves resources. In North America, a common indication for admission into the hospital is childbirth and the most common surgical procedure is a cesarean delivery (Wilson et al., 2018). Cesarean delivery rates have increased from 4.5% in 1970 to 31.9% in 2015 in the United States. Due to this impacting many surgical cases and always involving two or more patients (mother and fetus(es)), there is an immediate need for ERAS implementation in maternity care (Wilson et al., 2018). ERAS can be implemented for both scheduled and unscheduled cesarean deliveries.

The protocol begins with education in the obstetric physician's office prior to delivery and continues through hospital discharge. The preoperative components of ERAS include anesthetic medications, fasting, carbohydrate supplementation, and prophylactic antibiotics/skin preparation (Wilson et al., 2018). The intraoperative components of ERAS include anesthetic management, maternal hypothermia prevention, surgical technique, hysterotomy creation and closure, management of peritoneum,

subcutaneous space, and skin closure (Wilson et al., 2018). The perioperative and postoperative components of ERAS include chewing gum, management of nausea and vomiting, analgesia, timing of food intake, glucose management, antithrombotic prophylaxis, timing of ambulation, urinary management, and timing of maternal and neonate discharge (Wilson et al., 2018). ERAS promotes surgical quality and safety for obstetric surgical deliveries by following evidence-based maternal-focused practice recommendations.

Caughey et al. (2018) expand the ERAS recommendations for intraoperative care in cesarean delivery. ERAS has resulted in positive clinical results (reduction in length of stay, complications, and readmission) and health system benefits (reduction in costs). Intraoperative care recommendations include: delayed cord clamping for at least 1 minute at a term delivery or at least 30 seconds for preterm delivery, body temperature measured and maintained at 36.5 and 37.5 degrees Celsius after birth through admission and stabilization, avoidance of routine suctioning of the airway or gastric aspiration in the neonate (unless symptoms of an obstructive airway by secretions or meconium are present), routine usage of neonatal supplementation with room air is recommended versus supplementation with oxygen (associated with harm), and mandatory immediate neonatal resuscitation availability in all settings that perform cesarean deliveries (Caughey et al., 2018).

With the cesarean delivery rates steadily increasing since 1970, cesarean delivery indications have been summarized by the Maternal-Fetal Medicine Unit Network to attempt to initiate process change. The cesarean indications summarized were divided up into primary indications (dystocia 37%; nonreassuring fetal heart rate 25%; abnormal

fetal presentation 20%; other 15%; failed forceps or vacuum delivery 3%) and repeat indications (no vaginal birth after cesarean section attempt 82%; failed vaginal birth after cesarean sections attempt 17%; failed forceps or vacuum delivery 0.4%) (Caughey et al., 2018). Noted were the differences of complications associated with a scheduled low-risk cesarean birth (46,766 patients) and planned vaginal birth (2,292,420) (Caughey et al., 2018). The overall maternal morbidity was found to be cesarean delivery 2.23% and vaginal birth 0.9%. Other investigations have shown two-fold increased morbidity for cesarean deliveries caused by puerperal infection, hemorrhage, and thromboembolism (Caughey et al., 2018). The ERAS guidelines based on evidence-based intraoperative clinical care can enhance maternal safety and outcomes.

Macones et al. (2019) discuss postoperative care in cesarean delivery following ERAS evidenced-based recommended guidelines with a maternal focus. Specific ERAS postoperative care guidelines are recommended and include sham feeding (chewing gum) which reduces the time of recovery of gastrointestinal function. Another recommendation is nausea and vomiting prevention. These two symptoms can prolong surgical time and increase the risk of bleeding and surgical trauma. These symptoms can also increase the potential risk of aspiration, which is a recognized cause of maternal deaths. Nausea and vomiting can cause lower patient satisfaction and delay discharge from the hospital. The most common cause of nausea and vomiting is maternal hypotension from regional anesthesia. Several prevention methods are recommended for reducing hypotension related to spinal anesthesia such as colloid or crystalloid pre-loading, intravenous administration of ephedrine or phenylephrine, and lower limb compression (by bandages,

stockings, or inflatable boots) (Macones et al., 2019). Postoperative analgesia administration postoperatively is also recommended by ERAS guidelines.

The pain extends recovery time and delays discharge for patients. High pain scores may potentially prevent early mobilization and the mother's efforts to be independent and to care for her newborn. Multi-modal analgesia is a key ERAS guideline in the management of postoperative pain. Recommendations are using a long-acting intrathecal opioid (morphine), transversus abdominis plane field block, and/or oral analgesia such as nonsteroidal anti-inflammatory drugs. Peri-operative nutritional care is another ERAS recommendation to follow (Macones et al., 2019). It recommends a regular diet within 2 hours after cesarean delivery.

There are several successive recommendations. Notably, an early recommendation is perioperative glucose control. This step requires tight control of blood glucose which can reduce surgical site infections. Recommended next, is prophylaxis against thromboembolism. This recommends the use of pneumatic compression stockings to help prevent thromboembolic disease for those having a cesarean delivery. The next recommended step is early mobilization after cesarean delivery. This helps with the rapid return of bowel function, reduced risk of thrombosis, and decreased length of stay. The last recommendation postoperatively is urinary catheter removal immediately after cesarean delivery if there is not a need for ongoing strict assessment of urine output. Indwelling catheters can increase the incidence of urinary tract infections, urethral pain, and difficulty voiding. These complications can cause delayed ambulation, prolonged hospitalization, and increased cost.

Standardized written discharge instructions should be used for discharge teaching. This is recommended due to complications after discharge with cesarean deliveries such as surgical site infections, which occur in approximately 10% of patients, >80% of which develop after discharge (Macones et al., 2019). This data supports the need for information about the normal discharge course, signs and symptoms of infection, and activity instructions for when to seek medical treatment.

SSI Treatment Recommendations

According to Jasim et al. (2017), surgical site infections (SSIs) occur after surgery and in the part of the body where the surgery took place. SSIs can be superficial infections involving the skin only or more serious infections involving the tissues under the skin, organs, or implanted materials. Surgical site infection after cesarean delivery is associated with increased maternal morbidity, prolonged hospital stay, and increased medical costs. The surgical site infection rates range from 3-15% dependent upon the surveillance method used to identify infections, the patient population, and the use of antibiotic prophylaxis. Risk factors for cesarean section surgical site infections include age, elective versus emergency cesarean section, patient's BMI (body mass index), and patient care practices such as antibiotic prophylaxis. This study's findings (Jasim et al., 2017) show a notable relationship between SSI and BMI in the obese category, increased blood loss during surgery (SSI increased 30% for every 100 ml blood loss), intrathecal analgesia and spinal anesthesia, babies delivered in a breech presentation, and prolonged hospital stay. SSIs add additional health care costs and therefore strategies for prevention should be a focus. Prevention strategies include controlling maternal weight during pregnancy and reducing intraoperative blood loss. Reducing the length of hospital stay

after cesarean section and strategies that reduce cesarean section rates will lower morbidity and SSIs according to this study.

According to Riley et al. (2012), surgical site infection remains a significant cause of postoperative morbidity and increase in health care cost due to maternal readmission. Sources of cesarean delivery surgical site infections (SSIs) include ascension of vaginal bacteria into the uterine cavity and inoculation of bacteria in the surgical incision. Commonly pathogens such as *Staphylococcus aureus* (28.3%), coagulase-negative staphylococci (12.4%), *Enterococcus* species (10.1%), and *Escherichia coli* (9.6%) are causing post-obstetric/gynecologic surgery SSIs (Riley et al., 2012). The standard cesarean section SSI definition by CDC NHSN (2012) is superficial, deep incision, or organ space infection (endometritis). Implementation of bundles in US hospitals with the aim of preventing hospital-acquired infections and avoidable deaths can help prevent SSIs by the implementation of evidence-based interventions (Riley et al., 2012). Basic prevention steps for SSIs include appropriate selection and timing of prophylactic antibiotics, eliminating the use of razor shaving, postoperative glycemic control, optimizing tissue oxygen delivery, and maintaining perioperative normothermia. Active engagement of clinicians and patients is critical to an improvement process. In-services should be provided to share low transverse cesarean SSI rates to increase awareness and share ownership of the bundle. This study (Riley et al., 2012) found that combining evidence-based SSI prevention practices, effective infection prevention products (CHG cloths), and clinician and patient engagement, resulted in a substantial and sustained reduction in SSIs following low transverse cesarean sections.

Literature Related to Theoretical Framework

According to Snowden et al. (2014), the concept behind Imogene King's theory is based on the nurse and patient working together and collaborating to achieve certain goals. King's General Systems Framework Theory focuses on how important interactions are between nurses and patients. This is described as an open system with constant interaction with a wide range of environmental factors. King further explains that goals are set to be measured. King's goal is to make the patient in a healthier state. King's conceptual system has three interacting systems: personal, interpersonal, and social. The nurse and patient interact to work toward a goal. The end of the interaction, which extends over time, is called the transaction. The transaction is the individual's goal that is accomplished and the goal is met based on King's transaction model. The research data related to ERAS and surgical site infections promote that evidence-based guidelines make a difference in maternal morbidity and decreased length of stay post-cesarean delivery. ERAS also proves through research to make patients more satisfied with the care received and outcomes post-procedure.

Strengths and Limitations of the Literature

One strength of the literature related to ERAS is that there are numerous peer-reviewed, evidence-based studies related to this topic. The studies provide specific information about how ERAS was implemented and the results that were received. CDC and WHO (World Health Organization) also has been tracking maternal morbidity related to infection and support ERAS efforts to improve outcomes. This provides timely data points and references to support the ERAS intervention. The most predominant weakness of the literature is that although ERAS for other surgical specialties have been

implemented for several years, the specialty area of obstetrics has been slower to adopt ERAS processes.

CHAPTER III

Needs Assessment

Target Population

The target population for this project of implementing an OB ERAS protocol was anyone in the childbearing age giving childbirth by cesarean section. Obstetrics is a unique specialty, where healthcare needs and decision-making involve two patients simultaneously.

Target Setting

The target setting for implementing the ERAS protocol is in the hospital setting. The hospital setting can be divided into specific units that the ERAS protocol steps are followed. The specific target setting will begin in the pre-admission testing (PAT) area when the patient arrives for blood work, health history review, and anesthesia consult prior to the surgery date. An informational booklet is given to the patient in PAT to read and learn about ERAS protocol steps. This is where one-on-one education begins related to ERAS protocols, explanation of why behind taking ERAS steps, and the positive outcomes reviewed with the patient and family member. Once the patient is admitted for their cesarean section procedure, ERAS protocol continues in the pre-operative area prior to the patient going to the operating room. Then ERAS protocol continues into the operating room, postoperative, and postpartum units in the hospital setting. The hospital system has an obligation to develop norms to which the hospital and staff must conform and adapt, to serve patients by providing the best care possible, to allocate resources effectively and responsively, and to create policies that allow staff members to perform with integrity, ethically, and without malfeasance. Lastly, ERAS

protocol continues after the patient is recovering at home by following instructions such as drinking fluids to stay hydrated and preventing constipation, sleeping on a clean sheet, washing hands often, and keeping the incision clean.

Sponsors and Stakeholders

Sponsors and stakeholders related to implementing the ERAS include the patient, the infant, the patient's family, obstetrician, facility, and the community. The patient undergoing a cesarean section procedure is a stakeholder because they need the best outcome possible with the fewest complications. Other sponsors and stakeholders are the obstetricians. The obstetricians are rated by patients and the care they receive. The physicians would potentially receive higher ratings from patients who have fewer complications or issues post-cesarean section. Often, future patients research a physician by their ratings from other patient's experiences or outcomes. Physicians require the best outcomes and recovery for their patients to get higher ratings and financial benefits by attracting a higher volume of patients due to the increased ratings.

The hospital is a sponsor and stakeholder because ERAS can directly impact its star rating. The Centers for Medicare and Medicaid Services (CMS) has a star rating program that measures the overall quality of care and services of a facility. The star ratings range from one to five stars, with five stars being the best rating. The star ratings are based on mortality, patient experience, readmissions, and safety of care delivered (Masick & Bouillon, 2020). ERAS protocol could impact mortality, readmissions, and patient experiences directly and positively. Often, future patients research a facility's star rating as a way to guide where they seek medical care for scheduled procedures. Lastly, the community and the facility serve as stakeholders. ERAS can impact the community

through improved health of residents, having healthier mothers that can provide excellent newborn care, and influencing timely return to work.

SWOT Analysis

Strengths

- ERAS used with other surgical specialties within the facility
- Facility has an experienced Clinical Nurse Leader (CNL) that implements ERAS protocols and tools needed to be successful
- Lower SSI rates, decreased mortality rates/risk, increase of patient satisfaction scores, higher ratings for facility and MDs

Weaknesses

- Education for large amount of staff related to ERAS protocol implementation (Women's and Children (W&C) specialty areas have greater than 100 staff members, anesthesia and pharmacy personnel, PAT unit, physician office personnel, MDs)
- Immediate increase of hospital cost due to usage of ERAS implementation supplies
- Who will pay for (hospital or physician office budget) high carbohydrate clear drink and Chlorhexidine gluconate (CHG) soap/wipes that are given to a patient for use before arriving for surgery?
 - Project facility decided to ask the patient to use Dial™ soap instead of CHG and to drink orange juice instead of a high protein-carbohydrate drink

Opportunities

- Increased revenue for facility due to elevated patient/family experiences and better outcomes for patients
- Higher star ratings for facility and physicians

Threats

- Resistance to change from staff involved
- Patient resistance to lifestyle modifications before, during, and after procedure

Available Resources

One available resource for the patient is an ERAS informational booklet (Appendix A). This booklet is given to the patient in the physician's office when the cesarean section procedure is scheduled. This will give the patient time to read through the material and ask questions to their personal physician before their scheduled procedure. The patient's personal physician, along with physician office staff, are additional resources available for ERAS.

A resource for hospital staff is the Clinical Nurse Leader that specializes in the implementation of ERAS protocols. The Clinical Nurse Leader has implemented ERAS in other surgical specialty areas in the facility and therefore is an additional resource. Additionally, an evidence-based resource includes numerous articles related to supporting ERAS implementation in cesarean section deliveries. Recommendations for ERAS protocol are found in the Enhanced Recovery after Surgery Society, American Journal of Obstetrics & Gynecology, and the Society for Obstetric Anesthesia and Perinatology. There are many other scholarly and clinically based resources that can be utilized to implement the ERAS in cesarean section protocols.

Desired and Expected Outcomes

The desired and expected outcomes with ERAS implementation are for the patient (mother and infant) to have a quicker recovery, a reduced infection risk, and have a healthier mother that can care for a newborn and return to work in a timely manner. ERAS protocols have been shown to decrease hospital stays and return the family to their home sooner with their infant. Daily goals set by ERAS and all the parties involved, help bring the patient back to their normal activity level, improve mobility, and have less pain and nausea throughout the process.

Team Members

The team members that were an integral part of this project were the Clinical Nurse Leader for ERAS implementation, the Director of Women's and Children, Department representative from Anesthesia, Education liaison, the nurse managers from Labor and Delivery and Mom/Baby Postpartum unit, and the Chief of OB physician.

Cost/Benefit Analysis

One benefit of ERAS protocol implementation with cesarean section procedures is a decrease in SSIs. Statistics suggest that surgical site infections occur in approximately 10% of patients and >80% of those occur after discharge from the hospital (Macones et al., 2019). On average, the cost of an SSI after a cesarean section procedure is \$2852 (Macones et al., 2019).

The benefit of keeping the mother/infant dyad together and not disrupted by complications is priceless. If the mother/infant dyad is disrupted, then bonding can be affected and lactation success could be impacted. Breastfeeding saves the lives of infants

and reduces both infant and mother's disease burden (Dieterich et al., 2013). Therefore, it is of great importance for there to be no or little interruption to the mother-infant dyad.

The benefit of the mother being able to return to work as planned helps keep her family financially sound and helps secure her job position within the workforce. If the mother experiences complications that impact her returning to work within the allotted 12-week time frame, her current job position may not be held for her. The mother that worked on first shift may have to drop to third shift because that is where there was a job available. This could affect the mother's happiness with performing her job. If unable to return to work in 12 weeks, the mother may have to resign her position and lose her seniority. Seniority could affect how much PTO an employee accrues, holiday schedule preferences, and pay scales.

CHAPTER IV

Project Design

Goal

The overall purpose of implementing OB ERAS protocol for cesarean sections was to have a patient-centered care approach used to ensure the best possible outcomes from surgery. ERAS is an evidenced-based protocol that is proven to decrease SSI, decrease maternal mortality rates, and increase patient experience without interruption of mom/baby dyad. This protocol includes shorter NPO times, decreased surgical stress through a multi-modal approach to pain and nausea, improved patient outcomes with early mobility, less pain, nausea, reduced length of stay, and decreased variability of care. As a result of implementing this protocol, OB ERAS patients will have foley catheter insertion of no longer than 8 hours in at least 75% of post-operative cesarean section patients. Another goal of implementing OB ERAS protocol in this facility is for SSI rates to decrease by 2% within the first 2 years of all cesarean section patients.

Objectives

The objective of implementing OB ERAS protocol is to follow a specific pathway preoperatively, operatively, and postoperatively through maternal hospital discharge for scheduled and unscheduled cesarean section deliveries. To meet the first goal of discontinuing the Foley catheter within 8 hours of cesarean section procedures, the nurse will have this listed as a task on the worklist in the electronic documentation system. This will alert the nurse when discontinuing the foley needs to occur in order to meet the 8-hour time limit. Also, to meet the second goal related to decreasing SSI rates, this data will be tracked by the Clinical Nurse Leader for ERAS implementation. The Clinical

Nurse Leader will give updates of SSI rates each quarter in the OB Advisory meeting.

This meeting consists of members who can impact outcomes such as Obstetrical physicians, the Director of Women's and Children's services, and all managers of Women and Children's areas.

Plan and Material Development

Each patient will be given an OB ERAS office to discharge packet before surgery to study and prepare for necessary actions to take place. The patient and a family member will first be coached by physician office staff. Then the same information will be reinforced by presurgical testing staff. The office to discharge patient education packet is divided into phases of care for the patient. The phases are before surgery, after surgery, and recovering at home. The acronym DREAM to complete recovery is used to help explain each phase. During each phase, the acronym dream stands for the same items: D represents drink, R represents reduce stress and infection, E represents eat, A represents anti-pain and anti-nausea, and M represents move to improve.

ERAS: DREAM to a Complete Recovery: Before Surgery

D – Drink

- You will be able to drink clear liquids up to 2 hours before surgery. You will be encouraged to drink soon after surgery to prevent dehydration and constipation. Usually, we allow you to drink soon after giving birth.

R - Reduce Stress and Infection

- You will be given medications to help decrease your body's natural stress response from surgery. To help prevent infection, a nasal ointment and a special wash to clean your body will be used on you before surgery. Also, if you use

nicotine please stop as nicotine increases stress on the body and increases your risk for infection.

E – Eat

- You are encouraged to eat healthy foods before & after surgery. Eat fruits, vegetables, and protein-rich foods such as lean meats, cooked lentils, nuts, etc. with every meal. Your body needs healthy calories for healing and strength.

A – Anti-pain and Anti-nausea

- Pain is expected after surgery. You will be given medications and anesthesia to reduce the amount of pain and nausea before, during, and after surgery. This helps you to be able to eat, drink, and move soon after surgery.

M - Move to Improve

- You are encouraged to move as much as possible after surgery. Walking often will help reduce pain and soreness and get you home sooner!

ERAS: DREAM to a Complete Recovery: After Surgery

D- Drink

- Drink liquids to stay hydrated and to prevent constipation and dehydration.
- Fluids through your IV may be discontinued.
- Drink protein drinks with every meal to help with immunity, strength, and healing.

R- Reduce Stress and Infection

- Use the CHG bath treatments for the first 2 days, this helps to prevent infection.
- Your linens should be changed daily to help keep the incision clean.
- Wash your hands often and remind your family, friends, and caregivers to also.

- Brush your teeth and gums after meals and at bedtime.
- The urinary catheter should be removed within 8 hours after surgery.

E- Eat

- Eat healthy foods. Do Not Diet before surgery, your body needs healthy calories to heal.
- Eat fruits, vegetables, and protein to build immunity, strength, and helps with healing.
- Chew gum after meals. Chewing gum will help your bowels return to normal.

A- Anti-pain and Nausea

- Pain is expected after surgery.
- Report pain to your nurse before it gets severe.
- Medicine is available to help reduce pain and nausea.

M- Move to Improve

- Your care team will help get you in a chair soon after surgery, and at every meal.
- Your care team will help you walk at least three times per day and encourage to be out of bed for most of the day.
- Moving often will help reduce pain and soreness.
- Frequent walking can help prevent blood clots, infection, and get you home sooner!
- Your care team will encourage you to do lung exercises to prevent pneumonia and infection.

ERAS: DREAM to a Complete Recovery: Recovering at Home***D-Drink***

- To continue to drink fluids to stay hydrated and prevent constipation.
- Drink protein shakes to help with immunity, strength, and healing.

R-Reduce Stress and Infection

- Use clean sheets.
- Keep your clean incision.
- Do not let pets in your bed or get near your incision(s).
- Wash your hands often.
- Brush your teeth and gums after meals and at bedtime.

E-Eat

- No dieting!
- Your body needs healthy calories and protein to give you strength and energy to heal properly.
- Eat fruits, vegetables, and protein for building immunity, strength, and promote healing.

A-Anti-pain and Nausea

- Use alternate ways to deal with pain, stiffness, and soreness such as:
- Warm/cold compresses
- Meditation
- Music
- Tylenol (if okay with your doctor).
- Limit narcotic use to prevent constipation and other side effects.

M-Move

- Continue to move often when you are at home to prevent constipation, stiffness, and complications such as blood clots or pneumonia.
- Continue practicing the lung exercises at home.

Timeline

Implementation for OB ERAS timeline was outlined to be 6 months from the time the team was established for go-live. Due to the COVID-19 pandemic, the timeline has been extended to 1-year post team establishment. Currently, only patients are allowed in the physician's office for visits. One key element to OB ERAS success is to have a dedicated family member involvement. This is another reason the timeline was extended.

The timeline was established with monthly goals:

- In month 1, the established OB ERAS team members will meet and the clinical nurse leader for ERAS implementation will present general goals and patient care plan. During this meeting, the team will discuss concerns related to information presented or OB ERAS processes for any phase of care.
- In month 2, the Clinical Nurse Leader for ERAS implementation will present each area involved in OB ERAS with individual responsibilities. The Clinical Nurse Leader will discuss issues, concerns, or suggested changes with protocol.
- In month 3, the Clinical Nurse Leader for ERAS implementation will present staff education for OB ERAS to team members to critique.

Discussion will be focused on concerns the team members have specific to staff education for OB ERAS.

- In month 4, the clinical nurse leader for OB ERAS will work with the Clinical Nursing Education team to prepare presentation and assign OB ERAS education to specific areas involved. Deadlines for completion of education will be determined and a start date will be assigned in online HealthStream system that the facility currently uses.
- In month 5, the clinical nurse leader for OB ERAS will ensure all supplies needed to implement OB ERAS protocol are available and stocked on each individual area involved.
- In month 6, the clinical nursing education team and the clinical nurse leader for OB ERAS will meet face to face with units involved for question and answer sessions related to changes of care and individual responsibilities. Teach-back method will be used to ensure nurses and patient care technicians understand the OB ERAS protocol for their unit.
- In month 7, go live starts in the physician's office prenatally with scheduled cesarean section cases and then will slowly trickle down to presurgical testing, labor and delivery, and mom/baby postpartum units.

Budget

Implementing the OB ERAS protocol will have a simultaneous upfront cost and cost savings for the facility. The cost savings for the facility is based on OB ERAS protocol decreasing the number of SSI related to cesarean sections. Estimated cost

savings are \$2,852 for prevention of maternal readmission for cesarean section SSI and \$3,842 for endometritis (Riley et al., 2012).

The upfront cost to implement OB ERAS protocol is minimal compared to the benefits for patients and the facility. Each OB ERAS educational packet given to the patient will cost approximately \$.50. These packets are produced at a copy center within the facility, which minimizes the cost. The clear protein drinks given to patients with meals are approximately \$.35 each and are kept in stock by dietary services at the facility. The cesarean section patient typically stays 2-days and the total cost of protein drinks with meals per patient would be \$2.10. Another upfront cost is chewing gum sticks for patients to chew and stimulate the gut after meals. Chewing gum's total cost is approximately \$1.00 per patient. Many OB ERAS recommendations for preoperative and intraoperative phases are already available and used in these areas, therefore no additional cost was added to the unit. Due to the OB ERAS team members adjusting the recommended protocol, the patient will be providing their own Dial™ soap to bathe with and orange juice to drink prior to admission, therefore no upfront additional facility cost. These items were substituted for CHG wipes and clear protein drink that the facility would have had to provide each patient from the physician's office. Each phase of OB ERAS involves the usage of blood glucose monitoring. The blood glucose monitors and strips are already used and stocked in each unit due to previously needing these for diabetic patients. There will be increased usage of the machines and increased need for additional blood glucose strips but at this time, it would be minimal extra cost to each unit. The total upfront estimated budgeted cost for additional supplies for implementing OB ERAS is approximately \$5.00 per patient. Last year, this facility implemented OB

ERAS protocol, conducted 1,161 section procedures (scheduled and unscheduled). This facility may see an approximately \$5,805 increase in inpatient care over a year for implementing OB ERAS protocol. Implementation of OB ERAS could pay off the upfront cost by decreasing by two SSI readmissions related to cesarean section procedures for the year.

Evaluation Plan

The evaluation plan for OB ERAS will be conducted by the clinical nurse leader for ERAS implementation. This leader will use EPIC electronic documentation system reports to look at compliance with each phase of the protocol. During staff OB ERAS education, they noted specific areas in EPIC to document items such as patient mobility, chewing gum usage, protein drink supplements, foley removal within 8 hours, incentive spirometry usage, and administering scheduled medications within times set. This is important as it enables one to run EPIC reports based on documentation of specific OB ERAS protocol steps. Staff also will complete a post-test after the OB ERAS education is complete to evaluate the understanding of new processes and specific charting methods. A score of 80% or higher is required. Those not receiving an 80% or better will have one-on-one remedial instructions on the sections they were deficient with related to OB ERAS protocol. The clinical nurse leader for ERAS will then give the ERAS team and facility administration feedback about how the staff is doing with compliance with following the protocol and also feedback related to SSI and for cesarean sections. The Clinical Nurse Leader for ERAS implementation will document before the protocol begins what the facility's current SSI and readmission rates for cesarean section procedures. This will be used to compare SSI and readmission rates after the OB ERAS

protocol has been implemented. Patient satisfaction scores will be documented for each category of survey questions prior to OB ERAS implementation. These scores within each category will be compared after the implementation of OB ERAS to compare patient satisfaction. Also, the physician's office can ask specific questions related to patient satisfaction and OB ERAS upon the patient's return for their surgical follow-up appointment in 2 and 6 weeks. This information received in the physician's office will be most helpful if the patient had previously had a cesarean section where OB ERAS protocol was not used in comparison to their recovery using OB ERAS protocol.

CHAPTER V

Dissemination

Dissemination Activity

Implementation of OB ERAS was presented to the Women and Children's Leadership Team. The Women and Children's Leadership team was present for a PowerPoint presentation (Appendix B) and review of patient education handouts. This team consists of the Director of Women and Children, managers, and assistant managers from the following departments: Lactation, Neonatal Intensive Care, Pediatrics, Pediatric Intensive Care, Nurse-Family Partnership, Labor and Delivery, and OB Navigator. There was an active discussion after the presentation where questions were asked, and potential solutions were brainstormed to further address specific logistic needs to the OB department. All the team members present recognized that implementing ERAS in the OB setting presented unique challenges but could impact the future outcomes of maternal SSI rates and morbidity.

Limitations

The pandemic of COVID-19 over the past year has limited face-to-face interaction with patients and family members in the physician office and inpatient hospital settings. This has placed the implementation of OB ERAS on hold until restrictions are revised. The OB ERAS implementation project was also delayed due to hospital activities focused more on immediate safety for patients, visitors, and staff related to COVID-19. The Clinical Nurse Leader for ERAS implementation will notify key team members when the OB ERAS project can continue.

Implications for Nursing

Implementation of OB ERAS protocol will impact nursing by changing normal patient obstetric processes in each phase of care. This protocol demands more medications for patients on the front end but the preventable impact on the backend makes up for the increased interventions. This protocol may decrease future readmissions to the hospital related to surgical site infections which will impact the nurse to patient ratio on the obstetric unit.

OB ERAS may save nurses and patient care technicians time due to decreased pain interventions needed relating to spinal/epidural anesthesia administered during surgery. This type of anesthesia decreases the need for narcotic use; therefore, decreases the risks for the patient. Less pain will also help the patient be able to eat, drink, and move sooner after the cesarean section procedure.

OB ERAS implementation also has evidence-based information to prove a decrease in the average length of stay for the patient. ERAS reported higher maternal satisfaction in the early discharge group compared to women in a routine care group (Ituk & Habib, 2018). This can impact staffing needs on the unit and patient outcomes post-cesarean section procedure.

Recommendations

A recommendation for the facility implementing OB ERAS is to discuss and collaborate with other specialty areas that have previously implemented ERAS protocols. One recommended question is what went well with ERAS implementation. Another question is what changes to ERAS implementation would be recommended. The

information learned from other units could be shared with the Clinical Nurse Leader for ERAS implementation.

Also, the Clinical Nurse Leader for ERAS implementation could reach out to other facilities that have implemented OB ERAS protocols for their recommendations. The Clinical Nurse Leader may search out information related to wins, barriers, and any other miscellaneous information other facilities are willing to share. This information can be used to make OB ERAS implementation a smoother transition at this facility.

The consulting obstetrician suggested substituting apple juice or Gatorade® prior to the procedure as a substitute for the high carbohydrate drink. The obstetrician stated patients often complained of the taste of clear protein drinks and felt this would be an issue in an OB ERAS situation as well. Anesthesia approved this substitution to help with patient satisfaction and compliance of protocol too.

Conclusion

ERAS is a patient-centered care approach used to ensure the best possible outcomes from surgery. OB ERAS starts in the physician's office and is a process that continues through hospital discharge to the recovery period at the patient's home. OB ERAS improves mobility, decreases pain and nausea, reduces hospital length of stay, SSI, maternal mortality rates, and is an evidence-based practice model. The main purpose of OB ERAS implementation at this facility is to decrease the surgical site infection rates in women undergoing cesarean deliveries to decrease mortality rates. Implementation of OB ERAS is a multi-disciplinary approach, and an established group of team members was involved in the project development from all key areas. ERAS was previously implemented in other specialty surgery areas at this facility such

as orthopedics and gastrointestinal cases and has made a positive difference in outcomes.

Implementing OB ERAS at this facility can make a difference in the future for improved maternal outcomes.

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Appendix A

ERAS Informational Booklet

Dream to a Complete Recovery: C-Section Surgery **What is Enhanced Recovery After Surgery?**

Enhanced recovery after surgery, or ERAS, is a team approach to surgery that helps you get better quicker. The goals of ERAS are aimed to reduce the risk of infection, improve mobility, and decrease pain and nausea. Your ERAS team includes your obstetrician, nurses, anesthesiologists, nurse anesthetists, pharmacists, case managers, lactation specialists, and patient care technicians. The entire hospital team works with you to keep you informed and provide you with the best care before, during, and after your C-section.

Daily goals help you to return to normal activity levels. These goals are set for you through the ERAS program so that you can recover quickly and return home sooner with your newborn. Please do not get upset if you are not able to meet some of your daily goals as any work you do to reach those goals will still help you return to your normal activity levels.

***Goal of ERAS:** To help patients return to a healthy state after surgery.

ERAS: DREAM to a Complete Recovery: Before Surgery

D – Drink: You will be able to drink clear liquids up to two hours before surgery. You will be encouraged to drink soon after surgery to prevent dehydration and constipation. Usually, we allow you to drink soon after giving birth.

R - Reduce Stress and Infection: You will be given medications to help decrease your body's natural stress response from surgery. To help prevent infection, a nasal ointment and a special wash to clean your body will be used on you before surgery. Also, if you use nicotine please stop as nicotine increases stress on the body and increases your risk for infection.

E - Eat: You are encouraged to eat healthy foods before & after surgery. Eat fruits, vegetables, and protein-rich foods such as lean meats, cooked lentils, nuts, etc. with every meal. Your body needs *healthy* calories for healing and strength.

A – Anti-pain and Anti-nausea: Pain is expected after surgery. You will be given medications and anesthesia to reduce the amount of pain and nausea before, during, and after surgery. This helps you to be able to eat, drink, and move soon after surgery.

M - Move to Improve: You are encouraged to move as much as possible after surgery. Walking often will help reduce pain and soreness and get you home sooner!

ERAS: DREAM to a Complete Recovery: After Surgery

D- Drink:

- Drink liquids to stay hydrated and to prevent constipation and dehydration.
- Fluids through your IV may be discontinued.
- Drink protein drinks with every meal to help with immunity, strength, and healing.

R- Reduce stress and infection:

- Use the CHG bath treatments for the first two days, this helps to prevent infection.
- Your linens should be changed daily to help keep the incision clean.
- Wash your hands often and remind your family, friends, and caregivers to also.
- Brush your teeth and gums after meals and at bedtime.
- The urinary catheter should be removed within 8 hours after surgery.

E- Eat:

- Eat healthy foods. **Do Not Diet** before surgery, your body needs healthy calories to heal.
- Eat fruits, vegetables, and protein to build immunity, strength, and helps with healing.
- Chew gum after meals. Chewing gum will help your bowels return to normal.

A- Anti-pain and nausea:

- Pain is expected after surgery.
- Report pain to your nurse before it gets severe.
- Medicine is available to help reduce pain and nausea.

M- Move to Improve:

- Your care team will help get you in a chair soon after surgery, and at every meal.
- Your care team will help you walk at least 3 times per day and encourage to be out of bed for most of the day.
 - Moving often will help reduce pain and soreness.
 - Frequent walking can help prevent blood clots, infection, and get you home sooner!
- Your care team will encourage you to do lung exercises to prevent pneumonia and infection.

ERAS: DREAM to a Complete Recovery: Recovering at Home

Remember...

D-Drink	R-Reduce Stress and Infection	E-EAT	A-Anti-pain and nausea	M-Move
To continue to drink fluids to stay hydrated and prevent constipation.	Use clean sheets.	No dieting! Your body needs healthy calories and protein to give you strength and energy to heal properly.	Use alternate ways to deal with pain, stiffness, and soreness such as: <ul style="list-style-type: none"> • Warm/cold compresses • Meditation • Music • Tylenol (if ok with your doctor). 	Continue to move often when you are at home to prevent constipation, stiffness, and complications such as blood clots or pneumonia.
Drink protein shakes to help with immunity, strength, and healing.	Keep your clean incision.	Eat fruits, vegetables, and protein for building immunity, strength, and promote healing.	Limit narcotic use to prevent constipation and other side effects.	Continue practicing the lung exercises at home.
	Do not let pets in your bed or get near your incision(s).			
	Wash your hands often.			
	Brush your teeth and gums after			

meals and at
bedtime.

Patient Notes

Use this space to write down any questions you may have. Please be sure to share with your surgical care team.

[illegible]

Patient resources

Advance Directives: Health Care Power of Attorney and Living Will

Fast Facts:

- Completing the SC HCPOA document is free!
- Witnesses who are not able to sign are defined within the document.
- A copy of the SC HCPOA document and Living Will can be found at:
<https://livingwillforms.org/sc/>

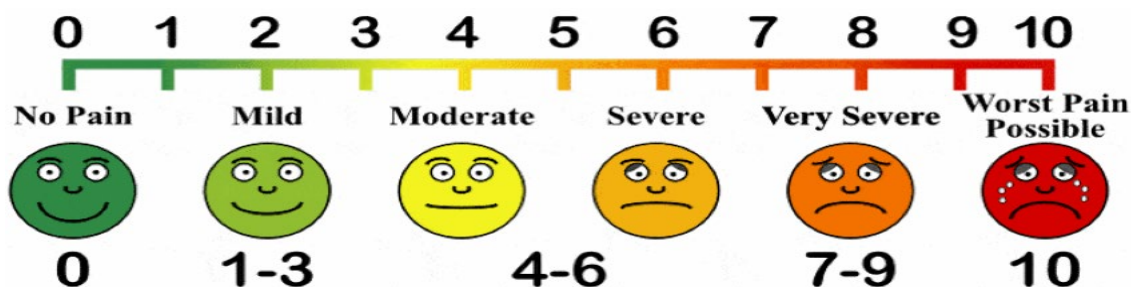
For additional information please email ACPresources@srhs.com, talk with your doctor, or visit the MyChart application for free advance care planning resources (Five Wishes, Prepare).

Smoking cessation: Call 1-800-QUIT-NOW or visit these helpful websites for more information:

<https://www.scdhec.gov/health/tobacco-quitline/im-ready-quit>

<https://smokefree.gov/>

How to rate your pain using the 0-10 rating scale:



Appendix B

PowerPoint Presentation

Implementation of Obstetric Enhanced Recovery After Surgery (OB ERAS) Protocol: Prenatally Through Transition to Community

By: Emily Corbett RN, BSN

ERAS

Enhanced Recovery After Surgery

- Evidence-Based Practice
- Patient-centered care approach to ensure best possible outcomes from surgery

Current State

In 2018:

3,791,712 women gave birth

31.9% Cesarean Section rate

Surgical Site Infections rates were 3-15%

National maternal mortality rate 17.4 deaths per 100,000 live births

OB ERAS Goal

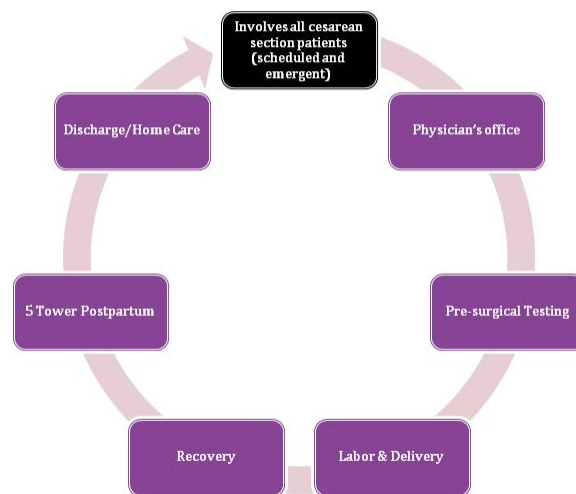
- To decrease the surgical site infection rates in women undergoing cesarean deliveries in order to decrease maternal mortality rates

Surgical Site Infections

- Increase maternal morbidity
- Prolongs hospital stay
- Increases medical cost



Implementation Process & Responsibilities



OB ERAS Team

- Obstetrical physicians
- Women & Children Director
- Anesthesia
- Nurses
- Clinical Nursing Educators
- ERAS Clinical Nurse Leader
- OB surgical team
- Patient Care Associates

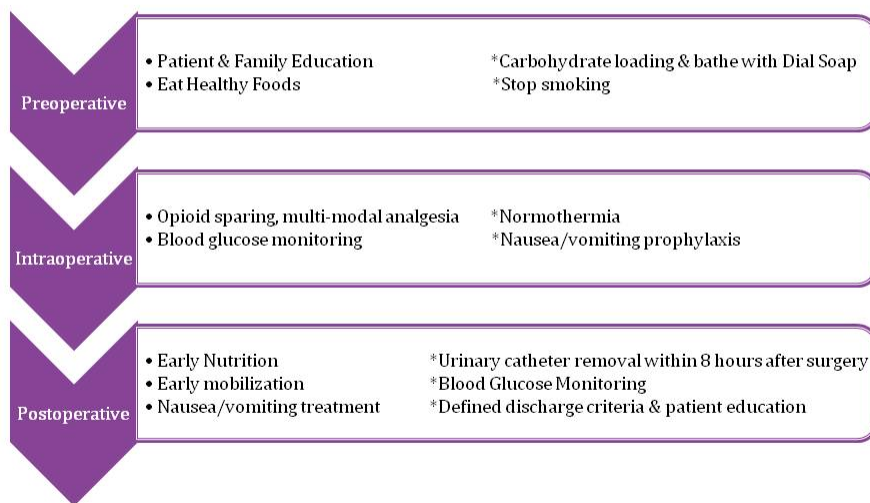
Resources Needed

- OB ERAS patient informational booklet
- Hospital staff support by the Clinical Nurse leader for ERAS and education team
- Supplies and medications needed to implement OB ERAS successfully

ERAS: DREAM To A Complete Recovery

- Drink
- Reduce Stress and Infection
- Eat
- Anti-pain and Anti-Nausea
- Move to Improve

OB ERAS Phases



Analysis of OB ERAS

<u>STRENGTHS</u>	<u>WEAKNESSES</u>
<ul style="list-style-type: none"> ➤ ERAS used with other surgical specialties within the facility ➤ Facility has experienced Clinical Nurse Leader (CNL) that implements ERAS protocols and tools needed to be successful ➤ Lower SSI rates, decreased mortality rates/risk, increase of patient satisfaction scores, higher ratings for facility and MDs 	<ul style="list-style-type: none"> ➤ Education for large amount of staff ➤ Immediate increase of hospital cost due to usage of ERAS implementation supplies ➤ Who will pay for (hospital or physician office budget) high carbohydrate clear drink and Chlorhexidine gluconate (CHG) soap/wipes that are given to patient for use before arriving for surgery.

Analysis Of OB ERAS

<u>OPPORTUNITIES</u>	<u>THREATS</u>
<ul style="list-style-type: none"> ➤ Increased revenue for facility due to elevated patient/family experiences and better outcomes for patients ➤ Higher star ratings for facility and physicians 	<ul style="list-style-type: none"> ➤ Resistance to change from staff involved ➤ Patient resistance to lifestyle modifications before, during and after procedure

Conclusion

- Implementing OB ERAS protocol ensures the best possible outcomes for all cesarean section procedures

- OB ERAS is an evidenced-based protocol that decreases SSIs, decreases maternal mortality rates and increases patient experiences

- OB ERAS includes shorter NPO times, decreased surgical stress through multimodal approach for pain and nausea, early mobility and reduces length of stay

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