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# Enhanced Recovery After Orthopedic Surgery in Total Hips and Knees

Christine Rigg

## Executive Summary

### Introduction of the Problem

The prevalence of joint replacement surgery is increasing related to a combination of factors: osteoarthritis, age, and obesity; improved surgical and anesthetic techniques make surgery possible for more people (Christelis et al., 2015). Osteoarthritis is the most common joint disorder in the United States symptomatically affecting 10% of men and 13% of women over the age of 60 (Zhang & Jordan, 2010). Demographics for individuals over the age of 60 are projected to rise as “baby boomers” drive the growth of the older population; by 2029 all baby boomers will be over 65 (Colby & Ortman, 2014). Baby boomers are leading a more active lifestyle than their predecessors, predisposing them to a higher rate of joint replacements (Clifford & Mallon, 2005). The most recent Centers for Disease Control and Prevention (CDC) (2015) data revealed that more than one-third of U.S. adults are obese. The rise of the former contributing factors is projected to make joint replacement the most common elective surgical procedure in the coming decades (Kremers et al., 2015). CDC (2014) identified that in 2012 alone, an estimated \$7.6 billion dollars was spent on total hip arthroplasty (THA) and \$11.1 billion dollars on total knee arthroplasty (TKA). CDC collective data from 2000-2010 revealed the average length of stay (LOS) after joint replacement in those older than 45 is four days (2015). The implications of an increased demand for joint replacement, current cost, and LOS place an increasing burden on clinical and financial resources (Sprowson, McNamara, & Manktelow, 2013).

The aforementioned information apprises the growing demand for lower extremity arthroplasty and ~~its~~ impact on the U.S. healthcare system. Evidence-based enhanced recovery

after surgery (ERAS) protocols have facilitated improved outcomes, such as increased patient satisfaction, and decreased associated costs. The benefits of enhanced recovery programs have been demonstrated by Auyong et al. (2015), Christelis et al. (2015), Garson et al. (2014), Husted et al. (2008), Khan et al. (2014), Malviya et al. (2011), and Sibia, MacDonald, & King (2016); their research revealed ERAS protocols resulted in a reduced length of hospital stay. The aim of implementing an orthopedic ERAS protocol is to improve patient satisfaction and reduce cost through expedited recovery, decreased complications, and early discharges. The first steps in implementing an ERAS protocol include development of a customized plan and introduction and education of staff involved. This project setting was a tertiary care center in central Illinois lacking an orthopedic ERAS program.

## **Literature Review**

In order to develop the total joint protocol, a literature search was performed to review evidence specific to ERAS in the orthopedic population. The ERAS protocol studies reviewed all resulted in reduction of LOS, mortality, and decreased costs, while improving outcomes. Auyong and authors (2015) determined a reduction in LOS did not coincide with an increase in readmission. Mean LOS was two days, and not ambulating on the day of surgery strongly correlated with increased LOS (Sibia et al., 2016). Garson et al. (2014) mean LOS for TKA was decreased from 3.6 days to 2.7 days and THA decreased from 4.2 days to 2.6. Husted and authors (2008) LOS was reduced from 8 days to 3.8, noting increased age and ASA scores correlated with extended LOS. Khan and authors (2014) experienced median LOS of three days in the ERAS group, compared to six days for the traditional. The study also had statistically significant reduction for 30-day incidence of myocardial infarction and death, as well as both 30 and 90-day decline in mortality. Christelis et al. (2015) reported a decrease LOS from six days to

three days and a reduction in 30-day and 90-day mortality after implementing an ERAS protocol. Long term morbidity was reduced at two years compared to the control group, which had a greater amount of complications including stroke, myocardial infarction, acute renal failure, and thromboembolic events (Savaridas et al.,2013).

Current research has supported a reduction in LOS and mortality with ERAS protocols for THA and TKA. In order to insure ERAS protocol success, many departments must work together. The anesthesia department is an integral part of the ERAS team and responsible for patient assessment as well as contributing to the understanding of the perioperative and postdischarge experience (Lukyanova & Reede, 2015). Anesthesia providers must also consider multimodal pain management strategies that eliminate or significantly reduce use of opioids to facilitate early mobilization, return to normal diet, while also reducing postoperative nausea and vomiting (Lukyanova & Reede, 2015).

### **Project Methods**

This practice project had two goals. The first was to develop an evidenced-based ERAS protocol built on outcomes of reviewed literature. The second goal was to introduce the protocols and educate the anesthesia department at a tertiary care center in central Illinois on ERAS for THA and TKA. The purpose of this project was to increase anesthesia department knowledge about ERAS and to encourage adoption of the introduced protocol.

An ERAS powerpoint was compiled for the educational presentation comprising the importance, goals, key elements, benefits, and protocols based on outcomes of reviewed literature. The protocol encompasses all aspects of perioperative care: preoperative, intraoperative, and postoperative care. The protocol is a tool utilized by all perioperative care providers: anesthesia, nursing, physicians. After the presentation, the staff received a fourteen-

question follow-up posttest that evaluated the educational presentation through a series of questions and ascertained the likelihood of supporting an ERAS protocol.

This project proposal was deemed exempt by SIUE's Institutional Review Board (IRB) on March 15, 2017. Following IRB approval, the tertiary care center's hospital research review committee approved the project. There were minimal threats to human subjects that chose to participate in the project. Consent to participate was validated by completion of the posttest. The major subject risk was loss of anonymity. To lessen the possibility of this risk, responses were strictly confidential.

### **Evaluation**

There were 40 people present for the live educational presentation which was 20 minutes long. An additional 20 minutes was allotted for educational posttest completion. The majority of anesthesia staff (70%) completed the educational posttest with certified registered nurse anesthetist being the most common job title (64.3%) of the sample. Majority of the respondents were white (75%) males (53.6%) between the ages of 50-64 years (39.3%). The results of the assessment questions suggest the educational posttest impacted the knowledge of the participants regarding ERAS. The first assessment question indicated that 32% of respondents had no knowledge of ERAS prior to the presentation. All respondents (100%) accurately answered the questions regarding the goals and purpose of ERAS. The majority (98.2%) of participants correctly answered questions specific to orthopedic ERAS, namely the preferred mode of anesthesia and the point of mobilization. The question pertaining to ERAS influencing readmission rates was the question with the most incorrect responses (17.9%). The higher percentage of incorrect responses may be attributed to the corresponding information being

delivered at the end of the presentation. In addition, given the manner in which the information was presented, the question may have also been poorly worded.

### **Impact on Practice**

The results of the study confirmed the presentation increased anesthesia providers' knowledge on ERAS. The staff indicated in their responses on the Likert scale support in adopting the introduced protocol built on current literature. This project was the first step in implementing an orthopedic ERAS protocol. The anesthesia department was educated and introduced a customized protocol. Success of any ERAS program requires the collaboration of many departments. This project can be replicated by educating and introducing ERAS to other departments. Long term impact of this project may include implementation of an orthopedic ERAS protocol leading to decreased LOS, decreased healthcare costs, and improved outcomes.

### **Conclusion**

This practice project met the two goals set forth. The first goal was to develop an evidenced-based total joint ERAS protocol built on outcomes of reviewed literature. The second goal was to introduce the protocol and educate the anesthesia department at the tertiary care center in central Illinois on ERAS. Implementing an ERAS protocol at the facility is aimed at improving patient care in those undergoing lower extremity joint surgery.

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