

Enhanced Recovery After Surgery:
Identifying and Overcoming Barriers to Ordering Postoperative Non-Opioid Analgesics

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Abstract

BACKGROUND AND AIMS: Although research has shown multiple benefits for colorectal patients following the Enhanced Recovery After Surgery (ERAS) protocol, Parkview Regional Medical Center (PRMC), Fort Wayne, Indiana showed protocol compliance regarding the use of two or more non-opioid analgesics postoperatively at 22% in July 2019, with a monthly goal of 75%. This Doctor of Nursing Practice scholarly project was developed to assist with compliance of the ERAS protocol. Objectives included: (1) identification of barriers to prescribing two or more non-opioid analgesics postoperatively and (2) increase the prescribing of two or more non-opioid analgesics for scheduled colorectal surgical inpatients at PRMC.

METHODS: This project included education for colorectal surgeons in January 2020, pre- and post-presentation surveys, and monthly aggregate data collection to track statistics three months pre- and post-implementation.

RESULTS: Pre- and post-presentation surveys showed no change in responses except one surgeon adding Tramadol to his post- survey as a medication to prescribe. ERAS monthly goal was met/exceeded in December 2019 (86.36%), January 2020 (88.89%), February 2020 (88.24%), and March 2020 (89.3%).

CONCLUSIONS: Compliance numbers increased above the project's goal one month prior to implementation and have sustained since that time, inferring increased compliance was not directly related to the project's implementation in January 2020. However, the project may have had an indirect influence on compliance by increasing awareness, solidifying ERAS knowledge, and encouraging the continuation of non-opioid analgesics postoperatively in the future.

Continued communication and education are key to sustaining compliance of ERAS

recommendations and to ensure high-quality, research-based care is delivered to colorectal surgery patients at PRMC.

Keywords: ERAS, Enhanced Recovery After Surgery, ERAS barriers, ERAS barriers to use, ERAS education, ERAS outcomes, ERAS benefits, quality improvement, non-opioid analgesic, colorectal surgery, colorectal surgeon, colorectal patient

DNP Scholarly Project Final Approval Form

University of Saint Francis
Institutional Review Board
Human Subjects Review Committee/ACUC/IBC
Institutional Review Board Approval Form

Protocol Number: 157035-HSRC

Review by (underline one): HSRC ACUC IBC

Date Reviewed: 10/09/2019 (with further electronic review through 10/21/2019)

Principal Investigator: Jennifer Hager

Faculty Advisor: Dr. Marsha King

Protocol Title: Enhanced Recovery After Surgery: Identifying and Overcoming Barriers to Ordering Postoperative Non-Opioid Analgesics

Study Site(s): Parkview Regional Medical Center

Items submitted for review:

- Items submitted for review:
[X] CITI Certificate
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[] Abstract
[X] Informed Consent Form (if applicable)
[X] Approval letter from outside institution - PRMC Surgery Center, PRMC (email approval)
[X] Other - explain: Data collection measures

Type of Review:

- Type of Review:
[X] Full Review
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Approval:

- Approval:
[] Approval granted on _____
[] Approval granted on _____ for a period of one year.
[X] Conditional approval* granted on 10/22/2019.
[] Not approved*
[] Other

*Comments: Address the following IRB concerns before you begin your project and data collection.

- Comments:
- Potentially identifying demographic questions - demographic questions appear to be unnecessary to study purpose and data analysis and the combination of data increases risk of participant identification, particularly with such a small sample. Consider which are absolutely essential to the study purpose.
- Given that you will be extracting patient data for analysis, we ask that you verify again whether you need to obtain IRB approval from Parkview.
- If data, especially patient data, will be stored on a personal computer, in addition to password protection of the computer, the data files must also password protected.

The committee performing this review is duly constituted and operates in accordance and compliance with local and federal regulations and guidelines.

Stephanie Oetting

Stephanie Oetting

10/22/2019

Printed Name (Chair or designee)

Signature

Date

IRB Committee Approval Form sjo 10/15/2019



Executive Summary

I. **BACKGROUND & RATIONALE**

This change project was developed in response to the lack of use of two or more non-opioid analgesics for postoperative colorectal patients when using the Enhanced Recovery After Surgery (ERAS) protocol at Parkview Regional Medical Center (PRMC), Fort Wayne, Indiana. The use of two or more non-opioid analgesics with ERAS has been shown to provide many patient benefits including decreased postoperative opioid use and decreased length of stay and is designed to decrease the patients' physiological stress response to surgery (AANA, 2018; ACP Hospitalist, 2017; Currie et al., 2016; Engelman et al., 2019; Greco et al., 2014; Li et al., 2017; McIsaac, Cole, & McCartney, 2015). ERAS order sets were launched in the electronic medical record (EMR) for colorectal surgery in August 2017. However, according to Lisa House, PRMC ERAS coordinator, and ERAS data that has been extracted by the PRMC quality department, the ERAS protocol recommended two or more non-opioid medications were not being ordered postoperatively by the colorectal surgeons (Personal communication, September 18, 2019). PRMC's goal for two or more non-opioid analgesics is 75% of postoperative colorectal patients; however, July 2019 statistics were 22% (L. House, personal communication, September 18, 2019).

This project included a pre-presentation survey which was distributed to the PRMC colorectal surgeons to assess current understanding of ERAS non-opioid analgesic recommendations and possible barriers to use. A presentation by the project manager regarding non-opioid analgesic recommendations occurred during colorectal surgery's monthly practice meeting in January 2020. A post-presentation survey was also included

to evaluate increased knowledge and decreased perceived barriers to use. Data was extracted by the quality department at PRMC to track non-opioid analgesic orders post-operatively pre and post presentation and aggregate data was shared with the project manager.

II. RESEARCH QUESTION

Does the number of non-opioid analgesics for Enhanced Recovery After Surgery (ERAS) scheduled colorectal surgical inpatients increase to the recommended two or more agents when barriers to use are identified and education is provided to colorectal surgeons?

III. METHODOLOGY

1. Project Approach: Quality Improvement
2. Methodological Model: Knowledge to Action Framework
3. Project Setting: PRMC conference room for presentation. Surgeries will be taking place at PRMC. EMR data will be extracted from the quality department at PRMC.
4. Timeline:
 - a. September 2019: Developed pre- and post-presentation survey.
 - b. December 2019: Developed presentation.
 - c. January 2020: Administered pre-presentation survey, implemented presentation, and administered post-presentation survey.
 - d. February 2020: Reviewed post-presentation survey results. Compared scores from pre-presentation surveys versus post-presentation surveys. Evaluated extracted data from quality department.
 - e. March 2020: Evaluated extracted data from quality department.

f. April 2020: Evaluated extracted data from quality department.

5. Inclusion/Exclusion Criteria:

- a. Inclusion for pre/post presentation survey and presentation: PRMC colorectal surgeons. Currently there are six colorectal surgeons at PRMC. They were included in this sample due to their role in ordering pain management medications in the EMR for their patients post-operatively.
- b. Inclusion for extracted EMR data: Scheduled colorectal surgical inpatients at PRMC, Fort Wayne, Indiana between October 2019 through March 2020. The number of patients was dependent on the need for surgery during the project period. Statistical data was extracted via the Quality Department at PRMC, Fort Wayne, Indiana and aggregate data was shared with the project manager.
- c. Exclusion: Colorectal surgical patients who were emergent (non-scheduled) and cannot be prepped for surgery under the ERAS protocol guidelines.

6. What Participants Were Expected To Do and Time Requirement

- a. Colorectal Surgeons
 - i. Expected to: Complete pre-presentation survey, listen to presentation, and complete post-presentation survey.
 - ii. Length of time required: Fifteen minutes or less for presentation (longer if providers had questions). Time for surveys were provider dependent but were estimated to be less than thirty minutes total.

b. Quality Department at PRMC

- i. Extracts ERAS data daily from patient charts for the ERAS Society and tracking; therefore, an estimated one hour was required to forward this information to project manager and assist in reading the information.

7. Risk Analysis: No risks identified.
8. Participant Benefits: Increased knowledge and understanding of ERAS protocol non-opioid analgesic recommendations and benefits.
9. Informed Consent: Informed consent document was drafted and presented to all colorectal surgeons who wished to participate in the ERAS project. No informed consent was needed for extraction of EMR data as all patients were confidential and no identifiers were obtained.
10. Deception: Deception was not be used for this project.

IV. IMPLEMENTATION METHODS, INSTRUMENTS, DATA COLLECTION AND CONFIDENTIALITY

1. Measures, Aims, and Proposed Outcomes:
 - a. Aim 1: Identify barriers to ordering two or more non-opioid analgesics for colorectal ERAS patients by the colorectal surgeons.
 - i. Developed and administered a pre-presentation survey to identify themes to barriers to ordering two or more non-opioid analgesics for colorectal ERAS patients. Goal of survey participation was 100% of colorectal surgeons.

- ii. A presentation regarding ERAS protocol recommendations of two or more non-opioid analgesics postoperatively for colorectal patients was presented at the monthly provider meeting. A post-presentation survey re-evaluated barriers and themes. Goal of provider participation was 100% of colorectal surgeons. Post-presentation survey was compared to pre-education survey and measured if barriers to ordering two or more non-opioid analgesics postoperatively for colorectal ERAS use decreased. A trend of decreased barriers will hopefully be translated to increased ordering of two or more non-opioid analgesics for postoperative pain management.
- b. Aim 2: Increase ordering of ERAS protocol recommended two or more non-opioid analgesics postoperatively for scheduled colorectal surgical inpatients at PRMC.
 - i. Baseline Data Comparison
 - 1. Increase ordering of ERAS protocol recommended two or more non-opioid analgesics postoperatively for scheduled colorectal surgical inpatients to 75% in the first quarter of 2020 compared to the fourth quarter of 2019.
- 2. Instruments/tools used to collect data provided
 - a. Pre-presentation survey and post-presentation survey: Paper forms. Both surveys contained a Likert Scale and a question and answer section. Survey was created by Jen Hager, DNP student, University of Saint Francis (project manager).

- b. Baseline Data Comparison: Data extracted by PRMC's quality department, more specifically, the number of colorectal surgical inpatients in which ERAS protocol recommended two or more non-opioid analgesics were ordered versus not ordered. Aggregate data was shared with the project manager.

3. Intervention plan

- a. The project intervention included:
 - i. Pre-presentation survey to identify barriers to ordering ERAS protocol recommended two or more non-opioid analgesics postoperatively - administered once in January 2020.
 - ii. Presentation regarding non-opioid analgesics for ERAS in January 2020. Specific topics of education included: Project manager introduction, summary of DNP project and goals, benefits of ERAS protocol, current ERAS recommendations, current colorectal ERAS statistics and goal, and current non-opioid medications available at PRMC.
 - iii. Post-presentation survey to compare barriers to ordering before versus after presentation has concluded - administered January 2020.
 - iv. Collection of data from the PRMC Quality Department, more specifically, the number of colorectal surgical inpatients who have orders for two or more non-opioid analgesics versus zero to one non-opioid analgesic. This data is tracked daily at PRMC through their quality department. Data for this project was collected October 2019

through March 2020 and aggregate data was shared with project manager.

4. Qualitative Data: Pre-/post-presentation survey contained a question and written answer section. Surgeons had the opportunity at the end of the survey to add additional comments and concerns. This qualitative information was used to identify themes.
5. Recordings: No participants were recorded audibly or visually for this project.
6. Data Collection Plan:
 - a. Baseline demographic data:
 - i. Colorectal surgeons: Age, number of years in practice, and if they routinely order two or more non-opioid analgesics for their ERAS patients.
 - ii. Patients: No specific demographic data or patient identifiers were needed for this project, as we only measured the number of non-opioid analgesics that are ordered.
 - b. Results from the paper surveys were collected by project manager.
 - c. ERAS statistics were extracted from the EMR by the PRMC quality department and aggregate data was shared with the project manager.
 - d. Data Storage:
 - i. Paper forms for surveys and identified by assigned numbers to protect identity. Papers were shredded once data was transferred to an Excel spreadsheet. All data is stored on project manager's personal computer including the list that identifies participants and assigned identification

numbers. Data will be stored until August 2020 and will be shared with the stakeholders of this project. Files will be password protected and saved on the cloud. The personal computer is password protected and locked when not in use by project manager.

7. Data analysis plan

a. Analysis of outcomes focused on:

i. Aim 1: Identify barriers to ordering two or more non-opioid analgesics for colorectal ERAS patients by the colorectal surgeons.

1. Pre-presentation survey results from Likert scale and question-answer section were used to identify barrier themes

ii. Aim 2: Increase ordering of ERAS protocol recommended two or more non-opioid analgesics postoperatively for scheduled colorectal surgical inpatients at PRMC.

1. Baseline data comparison

8. Disclosure of feedback (debriefing) that will be shared with participants

- a. Final project results and paper will be given to all stakeholders, as well as, the Parkview Nursing Research Department upon completion via email attachment.

V. RESOURCES & BUDGET

Stakeholders of the project include Jennifer Hager (Project Manager, DNP student at the University of Saint Francis), Dr. Marsha King (Project Advisor, University of Saint Francis), Kristen Miller (Surgery Manager, PRMC), Jim Dougal (Colorectal Surgery Practice Manager), Parkview Colorectal Surgeons, Lisa House (ERAS coordinator,

PRMC), Jenny Smith (Quality Department, PRMC), as well as, University of Saint Francis and Parkview Administration. Estimated budget for the project was \$50, which covered the cost of paper copies for surveys and education documents. In-kind contributions by stakeholders was also appreciated for their time.

Letter of support from Kristen Miller, PRMC surgery manager, is included. CITI Training has been complete by Jennifer Hager, DNP student, University of Saint Francis. IRB submission to PRMC is not necessary for this project.

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Chapter 1: Introduction

Problem

Problem Statement

Does the number of non-opioid analgesics for Enhanced Recovery After Surgery (ERAS) scheduled colorectal surgical inpatients increase to the recommended two or more agents when barriers to use are identified and education is provided to colorectal surgeons?

Background of the Problem

Enhanced Recovery After Surgery (ERAS) protocol originated in 1997 in Belgium and was used to decrease patients' stress response, optimize physiologic function, and facilitate recovery after gastrointestinal surgery (AANA, 2017). The protocol is patient-centered, evidence-based, and includes a multidisciplinary team including the patient, surgeon, anesthesia, nursing, and therapies such as physical therapy and occupational therapy. ERAS features a continuum of care beginning at home and rotating through preadmission, preoperative unit, operating room, postoperative unit, and ending at home again. During the preadmission stage, the patient and family are educated regarding the surgery and pain management plan. This time is also used for patient optimization of their chronic diseases such as diabetes, hypertension, and smoking. The preoperative phase consists of limited fasting (light meal up to six hours preoperatively), a carbohydrate beverage two hours preoperatively, preoperative medications, pain blocks, and discharge planning. Intraoperatively, the anesthesia team uses opioid sparing techniques, nausea and vomiting prophylaxis, avoidance of tubes and drains, and maintenance of fluid volumes, body temperature, and blood sugar. Postoperatively, early nutrition and mobilization are encouraged, multimodal analgesia is used, judicious fluid management, nausea and vomiting management, and patient education are used. Lastly, at discharge, patients and

families are instructed to monitor for new symptoms or changes, follow up with the surgeon, and continue with therapy and activities as tolerated.

Practice/Knowledge Gap

This quality improvement project was developed in response to the failure to prescribe two or more non-opioid analgesics for postoperative colorectal patients when using the ERAS protocol at Parkview Regional Medical Center (PRMC), Fort Wayne, Indiana. The use of two or more non-opioid analgesics with ERAS has been shown to provide many patient benefits including decreased postoperative opioid use, decreased length of stay, and decreased physiological stress response to surgery (AANA, 2018; ACP Hospitalist, 2017; Currie et al., 2016; Engelman et al., 2019; Greco et al., 2014; Li et al., 2017; McIsaac, Cole, & McCartney, 2015). ERAS order sets were launched in the electronic medical record (EMR) for colorectal surgery at PRMC in August 2017. However, according to Lisa House, PRMC ERAS coordinator, ERAS data that has been extracted by the PRMC quality department indicates the ERAS protocol recommended two or more non-opioid medications are not being ordered postoperatively by the colorectal surgeons (Personal communication, September 18, 2019). PRMC's goal for ERAS compliance regarding prescribing two or more non-opioid analgesics postoperatively for colorectal surgery patients is 75%; however, July 2019 statistics indicated that only 22% of colorectal surgery patients were prescribed two or more non-opioid analgesics (L. House, personal communication, September 18, 2019).

Two of the known advantages of ERAS protocol include decreased opioid use and decreased length of stay (AANA, 2018; ACP Hospitalist, 2017; Currie et al., 2016; Engelman et al., 2019; Greco et al., 2014; Li et al., 2017; McIsaac, Cole, & McCartney, 2015). The ERAS protocol focuses on multi-modal pain management including non-opioid medications such as

Ofirmev, tramadol, gabapentin, dexmedetomidine, ketamine, and peripheral nerve blockade to avoid perioperative-related drivers of the opioid crisis and avoid reliance on traditional opioid pain relief (Engelman et al., 2019; Stone, Wick, Wu, & Grant, 2017). Research reports that patients who follow the ERAS protocol consume a significantly lower amount of opioids per day postoperatively and consume only about one fourth of the amount of opioids compared to non-ERAS patients (AANA, 2018; Xu et al., 2015). Decreased length of stay is another beneficial point of the ERAS protocol which also results in cost savings for both the patient and the hospital system. ERAS patients have been shown to decrease length of stay by half or about two to three days, leading to an average cost savings of between \$880-\$5,560 for patients when ERAS protocols were initiated including decreased in room fees, laboratory fees, and other miscellaneous fees (Chipollini et al., 2017; Greco et al, 2014; Schmidt, El Lakis, Markar, Hubka, & Low, 2016; Xu et al., 2015).

Needs Assessment

PRMC implemented an ERAS order set into their EMR for colorectal patients; however, in July 2019, only 22% of postoperative colorectal patients were given two or more non-opioid analgesics (L. House, personal communication, September 25, 2019). There was a definite opportunity for improvement at PRMC to increase ordering of two or more non-opioid analgesics to a minimum of 75% of patients. According to Lisa House, PRMC ERAS coordinator, the ERAS committee at PRMC had a goal of increased compliance of the ERAS protocol recommendations to decrease use of opioids and decrease length of stay to ultimately decrease cost and increase patient satisfaction (Personal communication, July 17, 2019).

DNP Project Overview

Scope of Project

This project included a pre-presentation survey which was distributed to the PRMC colorectal surgeons to assess current understanding of ERAS non-opioid analgesic recommendations and possible barriers to use (Appendix A). A ten to fifteen-minute oral presentation by the project manager occurred during colorectal surgery's monthly practice meeting in January 2020. A post-presentation survey was distributed after the presentation to evaluate increased knowledge and decreased perceived barriers to use (Appendix A). EMR data is extracted daily by the quality department at PRMC. Jenny Smith (Quality department, PRMC) and Lisa House (ERAS coordinator, PRMC) both track ERAS data daily including non-opioid analgesic orders post-surgery and shared aggregate statistics with the project manager monthly from October 2019-March 2020.

Stakeholders

Stakeholders of the project included Jennifer Hager (Project Manager, DNP student at the University of Saint Francis), Dr. Marsha King (Project Advisor, University of Saint Francis), Kristen Miller (Surgery Manager, PRMC), Jim Dougal (Colorectal Surgery Practice Manager, Parkview Physicians Group), PRMC Colorectal Surgeons, Lisa House (ERAS coordinator, PRMC), Jenny Smith (Quality Department, PRMC), as well as, University of Saint Francis and Parkview Administration.

Budget and Resources

Cost and Description of Resources

To cover the cost of paper copies for surveys (Appendix A) and informed consents (Appendix B), an estimated budget of \$50 was generated (Appendix C). Surveys and informed

consents were written by the project manager, who also funded the project. In-kind contributions by stakeholders were also be appreciated for their time spent on coordinating, sharing EMR data, and participating in surveys and project presentation.

Process and Outcomes

General Timeline

The timeline for this quality improvement project ran from September 2019 through April 2020 (Appendix D). Pre-presentation surveys were given to colorectal surgeons in January 2020 to identify themes regarding barriers to use of ERAS protocol recommended, two or more non-opioid analgesics post-operatively. Implementation of the presentation and the post-presentation survey were implemented in January of 2020, after the pre-presentation survey. Surveys were reviewed and EMR data was extracted and reviewed in the spring of 2020.

Setting and Target Population

Project setting was the PRMC conference room for presentation and surveys. EMR data was extracted from the quality department at PRMC and included scheduled colorectal surgery patients at PRMC. The project sample for surveys and presentation included all six PRMC colorectal surgeons due to their role in ordering pain management medications in the EMR for their patients post-operatively. Sample for extracted EMR data included scheduled colorectal surgical inpatient records at PRMC between October 2019 through March 2020. The number of patient records included in this sample was dependent on the need for surgery during the project period. Statistical data was extracted via the quality department at PRMC and aggregate data was shared with the project manager. Excluded from this project's sample were colorectal surgical patients who were emergent (non-scheduled) and could not be prepped for surgery under the ERAS protocol guidelines.

Expected Outcomes

Desired outcomes for this project included identification of barriers to prescribing two or more non-opioid analgesics postoperatively for scheduled colorectal ERAS patients and increased prescribing of two or more non-opioid analgesics postoperatively for scheduled colorectal ERAS patients at PRMC. In July 2019, the quality department at PRMC reported that 22% of colorectal ERAS patients were prescribed two or more non-opioid analgesics postoperatively (L. House, personal communication, September 18, 2019). The project goal was to increase ordering of two or more non-opioid analgesics postoperatively to 75% or more at PRMC for scheduled colorectal surgical patients.

Risk Analysis

No risks were identified, and deception was not used for this project. Participant benefits included increased knowledge and understanding of ERAS protocol non-opioid analgesic recommendations and benefits. An informed consent document was drafted by the project manager (Appendix B) and was presented to all colorectal surgeons who wished to participate in the ERAS project. No informed consent was needed for extraction of EMR data, as all patients were confidential, and no identifiers were obtained.

Chapter 2: Synthesis of Supporting Evidence/Literature and Project Framework

Relevant Theory and Concepts

Project Model

The Knowledge-to-Action Model was used for this project, as the model was developed as an integration of knowledge creation and knowledge application, where new knowledge moves through the stages until it is adopted and used (Centers for Disease Control and Prevention, 2014). This project's framework began with a broad idea and current best evidence

related to the benefits of prescribing two or more non-opioid analgesics for postoperative colorectal patients following the ERAS protocol. This idea was “funneled” down to a synthesis of research and application into practice, where postoperative colorectal patients are prescribed the recommended two or more non-opioid analgesics. Major concepts of the Knowledge-to-Action Model and applicable project steps include (White, Dudley-Brown, & Terhaar, 2016)

(Table 1X):

Major Concepts	Application to Project	Intervention
1. Identify a problem that needs to be addressed and/or reviewed and select the knowledge or research relevant to the problem.	Failure to prescribe two or more non-opioid analgesics to postoperative colorectal patients at PRMC was identified as the problem for this project.	An extensive literature review regarding ERAS protocol and outcomes has been completed.
2. Adapt the knowledge or research relevant to the problem.	This quality improvement project was based on current evidence-based research.	Available literature regarding the ERAS protocol recommended multi-modal pain management approach was reviewed and synthesized for this project.
3. Assess barriers to knowledge use.	By identifying barriers, this project will help PRMC overcome them.	Barriers to prescribing two or more non-opioid analgesics postoperatively by the colorectal surgeons were identified using a pre-presentation survey to identify themes.
4. Select, tailor, and implement interventions to promote use of the knowledge.	Barriers were identified and addressed with prescribing colorectal surgeons during their monthly meeting.	A presentation was implemented to discuss the ERAS protocol recommendations and to address possible barriers. A post-presentation survey was completed to evaluate increased knowledge and decreased perceived barriers to use.

5. Monitor knowledge use.	The PRMC quality department currently tracks ERAS data daily including prescribing two or more non-opioid analgesics.	Statistics were shared with the project manager for this sample for three months prior to and three months after the presentation, to track knowledge use.
6. Evaluate outcomes of knowledge use.	Evaluation showed effectiveness of project intervention.	ERAS EMR data was used to compare pre-presentation knowledge use versus post-presentation knowledge use. This was represented by an increase in prescribing of two or more non-opioid analgesics for scheduled colorectal surgical patients.
7. Sustain knowledge use.	Tracking ERAS data in the future ensures protocols are followed to deliver high quality, evidence-based care.	Continuous data collection by PMRC's quality department will monitor the prescribing of two or more non-opioid analgesics and the continuation of knowledge use.

Literature Review

Literature search strategies. This systematic review of literature began with a search of articles pertinent to this topic. Multiple search engines were used including: ACP PIER, Clinical Evidence Electronic Textbook, DARE, Dynamed, EBSCO, TRIP Database, National Guideline Clearinghouse, National Institute of Health and Clinical Excellence, Anesthesia Related Guidelines, CINAHL Plus, Emcare, Google Scholar, PsycInfo, PubMed, Directory of Open Access Journals, ASU DNP Final Project Collection, University of San Francisco Open Access DNP Scholarly Project Repository, George Washington University DNP Project Repository, Sigma Theta Tau Virginia Henderson e-Repository, FedStats, Indiana.gov Statistics, Allen County, IN Health Statistics, Allen County, IN Census Statistics, Library of Congress Virtual Reference Shelf: Health and Medical, and the American Association of Nurse Anesthetists.

Searches were conducted using keywords, phrases, and specific subject headings, including: Enhanced Recovery After Surgery (ERAS), ERAS, ERAS implementation, ERAS barriers, ERAS barriers to change, ERAS education, ERAS outcomes, ERAS benefits, ERAS certified registered nurse anesthetist, ERAS anesthesia, ERAS opioid use, ERAS length of stay, ERAS cost, ERAS statistics, hospital cost per day, surgery opioid use, opioid-free anesthesia, and benefits of opioid-free anesthesia.

There is a considerable amount of literature regarding the Enhanced Recovery After Surgery (ERAS) protocol found within the databases listed. The purpose of this review of literature was to help identify benefits of prescribing two or more non-opioid analgesics to scheduled colorectal surgical patients including (a) decreased post-operative opioid use and (b) decreases the length of hospital stay.

Literature regarding post-operative opioid use. The ERAS protocol focuses on multi-modal pain management to avoid perioperative-related drivers of the opioid crisis and avoid reliance on traditional opioid pain relief (AANA, 2018; AANA, 2019; Stone, Wick, Wu, & Grant, 2017). Unfortunately, traditional opioid medications are associated with sedation, nausea, vomiting, respiratory depression, and ileus (AANA, 2018; AANA, 2019, Engelman et al., 2019; Gustafsson et al., 2019). The use of ERAS has been shown to provide many patient benefits including decreased postoperative opioid use and related complications and decreased length of stay (AANA, 2018; ACP Hospitalist, 2017; Currie et al., 2016; Engelman et al., 2019; Greco et al., 2014; Li et al., 2017; McIsaac, Cole, & McCartney, 2015). Medications including Ofirmev, tramadol, gabapentin, dexmedetomidine, ketamine, and peripheral nerve blockade all decreased the use of opioids post-operatively (AANA, 2018; AANA, 2019; Engelman et al., 2019; Gustafsson et al., 2019; Zafar, Davies, Greenslade, & Dixon, 2010). Research has resulted

in significant findings regarding opioid use, reporting that patients who follow the ERAS protocol consume a significantly lower amount of opioids per day postoperatively, by up to one fourth when ERAS protocols are followed (AANA, 2018; AANA, 2019; Gustafsson et al., 2019; Xu et al., 2015). A multimodal approach will also support early mobilization, quicker return of bowel function, and less postoperative complications, which is key for colorectal surgical patients (AANA, 2018; AANA, 2019; Gustafsson et al., 2019).

The true extent of the opioid crisis in the United States may not be fully understood by the public; however, it is costing our country \$78.5 billion a year, including the costs of healthcare, lost productivity, opioid addiction treatment, and legal fees (National Institute on Drug Abuse, 2018). If this number was not alarming enough, approximately 21-29 percent of patients given a prescription for opioids misuse them and 8-12 percent of patients develop an opioid use disorder (National Institute on Drug Abuse, 2018). These statistics are proof that health care providers should not take this matter lightly. Specifically, for anesthesia providers, non-opioid therapies would be optimal if able to have the same or better results in comparison to opioid pain management.

Literature regarding length of stay. One of the most beneficial points of the Enhanced Recovery After Surgery (ERAS) protocol is the decreased length of hospital stay which results in cost savings for the patient and hospital system. In some studies, patients who participated in the ERAS protocol were shown to decrease their length of stay by two to three days and others decreased their length of stay by about half (AANA, 2018; AANA, 2019; Greco et al., 2014; Xu et al., 2015).

Decreasing length of stay by almost half has many benefits for patients and hospital systems including cost benefits. In the era of outrageous health care cost and spending, the

ERAS protocol can make a significant difference in reducing cost for patients, facilities, and society in general. The American Association of Nurse Anesthetist reported that patients have a cost savings of between \$880-\$5560 when ERAS protocols are initiated (2018). This cost savings is likely significant for patients. Watson (2015) reported a decrease in average per patient cost for the hospital of \$1,763, which is also significant for hospitals considering the number of surgical patients they care for each year.

Literature regarding other benefits. In addition to the benefits of decreased opioid use and decreased length of stay, there are several other benefits that are worthy enough to note. Xu et al. (2015) noted significant findings regarding decreased incidence of post-operative ileus, noting a decrease of incidence of about one third when ERAS protocol was used which may be linked to lower opioid consumption with ERAS protocol patients. Several meta-analyses also note significant data regarding postoperative morbidity decreased by 40-50% with when ERAS protocols are used (Xu et al., 2015).

Summary of Supportive Evidence

Research has shown many benefits to following each step of the ERAS protocol including decreased postoperative opioid use and decreased length of stay. By following these stepwise, research-based recommendations, PRMC can take advantage of these benefits as well. An important step of these recommendations includes using a multimodal analgesic approach to address pain from several different angles and reduce the need for traditional opiates.

Chapter 3: Project Design

Methodology

Project Design

The design of this DNP project was quality improvement. The ERAS protocol was implemented at PRMC for all colorectal surgical patients; however, scheduled colorectal surgical patients were not consistently being prescribed two or more non-opioid analgesics postoperatively. The goal of this project was to increase prescribing by identifying barriers and increasing colorectal surgeons' knowledge and awareness of the ERAS recommendations. By following the ERAS protocol recommendations, PRMC will improve the quality of patient care based on evidence-based research suggesting decreased postoperative opioid use, early mobilization, quicker return of bowel function, and less complications (AANA, 2018; ACP Hospitalist, 2017; Currie et al., 2016; Engelman et al., 2019; Greco et al., 2014; Gustafsson et al., 2019; Li et al., 2017; McIsaac, Cole, & McCartney, 2015). This quality improvement project implemented evidence-based research that supports the ERAS protocol recommendations, identified the need for quality of improvement, generated or reinforced knowledge regarding ERAS protocol recommendations, and encouraged interprofessional collaboration (Rouen, 2020).

Ethical Considerations

No risks were identified for the project participants. Deception was not used for this project. Informed consent document was drafted and presented to all colorectal surgeons who wished to participate in the ERAS project (Appendix B). No informed consent was needed for extraction of EMR data as all patients were confidential and no identifiers were obtained.

A letter of support from the PRMC Surgery Manager, who launched the ERAS protocol at PRMC, was obtained (Appendix E). CITI Training certificates were earned by the project manager to ensure proper ethical considerations were achieved (Appendix F). Institutional Review Board (IRB) approval from PRMC was not needed according to the PRMC Nursing Research Evidence Based Practice committee, as this project was quality improvement based and did not involve direct contact with patients (Appendix G). This project was submitted to the University of Saint Francis IRB and conditionally approved (Appendix H). Modifications to the project to meet University of Saint Francis IRB guidelines included: 1) Removing potentially identifiable demographic questions from the survey, 2) Clarifying use of aggregate data from the PRMC quality department which contains no demographic patient information, and 3) Expounding upon data file security measures. Resubmission to the University of Saint Francis IRB was not required.

Project Schedule and Work Breakdown

In the summer 2019, the project manager met with the PRMC Surgery Manager and determined there was a need for quality improvement regarding ERAS protocol practices at PRMC (Personal communication, July 17, 2019). In the fall 2019, quality improvement was focused on the prescribing of two or more non-opioid analgesics for all scheduled colorectal surgical patients per ERAS protocol recommendations. PRMC quality department reported that only 22% of colorectal ERAS patients fell into protocol recommendations with a goal of 75% overall (L. House, personal communication, September 25, 2019). This project focused on identifying barriers to prescribing and increasing the use of two or more non-opioid analgesics for scheduled colorectal surgical patients.

Pre-presentation surveys were administered to the colorectal surgeons at PRMC during their monthly practice meeting in January 2020 with the goal of identifying barriers to use of two or more non-opioid analgesics. A ten-minute oral presentation and a post-presentation survey followed, to evaluate the colorectal surgeons' views pre- versus post-presentation regarding prescribing two or more non-opioid analgesics. ERAS data is reviewed daily by the PRMC quality department. Pre- and post-intervention ERAS aggregate data was shared with the project manager to evaluate the prescribing of two or more non-opioid analgesics before versus after presentation to see if identification of barriers and increased knowledge regarding the protocol increased protocol compliance. EMR data was shared with the project manager from October 1, 2019 to March 31, 2020 to compare prescribing and trend quality improvement.

Implementation Methods

The project intervention included a pre-presentation survey in January 2020 during the monthly colorectal surgeon provider meeting at PRMC (Appendix A). Informed consent for project participation was also included at this time (Appendix B).

An oral presentation and accompanying paper handout (Appendix I) regarding non-opioid analgesics for ERAS was implemented in January 2020, following the pre-presentation survey. A post-presentation survey was completed immediately following the presentation to compare barriers to ordering before versus after presentation was concluded (Appendix A).

Measures/Tools/Instruments

Pre-presentation survey and post-presentation survey were paper forms which were created by the project manager and were administered and collected by the project manager (Appendix A). Both surveys contained a Likert Scale, as well as, a question and written answer

section. Surgeons had the opportunity at the end of the survey to add additional comments and concerns. This qualitative information was used to identify themes.

Collection of data was obtained from the PRMC Quality Department, more specifically, the number of colorectal surgical inpatients who have orders for two or more non-opioid analgesics versus zero to one non-opioid analgesic. Goal for this project was to increase to 75% or more patients prescribed two or more non-opioid analgesics postoperatively. This data is tracked daily at PRMC through their quality department. Aggregate data for this project was collected October 2019 through March 2020 and shared with the project manager.

Evaluation Plan

Methods for collection of data. Pre- and post-presentation surveys were administered and collected by the project manager during the monthly colorectal surgeon provider meeting in January 2020 (Appendix A). Surveys included baseline demographic data of age and number of years in colorectal surgery. Currently there are six colorectal surgeons at PRMC and goal for participation is 100%. They are included in this sample due to their role in ordering pain management medications in the EMR for their patients post-operatively. The survey also included a Likert Scale and question and written answer section to help identify themes and barrier to prescribing.

The PRMC quality department collects and analyzes ERAS data daily which includes data regarding the number of non-opioid analgesics prescribed to scheduled colorectal surgical patients, more specifically, the percentage of patients prescribed two or more non-opioid analgesics versus the percentage of patients prescribed less than two. This aggregate data was shared with the project manager monthly from October 2019 through March 2020. Aggregate data did not include any patient identifiers or demographic data.

Paper forms were used for surveys and identified by assigned numbers to protect participant identity. Papers were shredded once data was transferred to an Excel spreadsheet. All data is stored on the project manager's personal computer including the list that identifies participants and assigned identification numbers. Data will be stored until August 2020 on the cloud and will be shared with the stakeholders of this project. The personal computer and excel spreadsheets are password protected and locked when not in use by the project manager.

Data analysis plan. Data analysis focused on achieving the project's two aims: (1) identification of barriers to prescribing the ERAS protocol recommended two or more non-opioid analgesics postoperatively and (2) increase the prescribing of two or more non-opioid analgesics for scheduled colorectal surgical inpatients at PRMC.

Aim 1 was measured via the pre- and post-presentation survey (Appendix A) and provided statistical evidence of barriers to prescribing and knowledge gained. This was measured pre- and post-presentation; therefore, measuring the increased or decreased likelihood of use. The hope was that a trend of high likelihood of use would be directly proportional to actual use of the ERAS protocol. Surveys were measured via Likert Scale and qualitative question and answer sections (Appendix J).

Aim 2 was measured via aggregate data collected by the PRMC quality department and shared with the project manager. This aggregate data represented the percentage of scheduled colorectal surgical patients who were prescribed two or more non-opioid analgesics. In July 2019, the PRMC quality department reported that 22% of targeted patients were prescribed two or more non-opioid analgesics (L. House, personal communication, September 18, 2019). PRMC's and this project's goal was to achieve 75% or more. Monthly aggregate percentage data from October 2019 through March 2020 was collected by the project manager to compare

values prior to presentation and after presentation using a baseline data comparison method (Appendix J).

Dissemination Plan

A written proposal was submitted to the University of Saint Francis (USF) DNP faculty for formal review and final approval prior to graduation. A formal presentation occurred on June 19, 2020 at USF, which included a power point presentation by the project manager. A written Executive Summary was also distributed to USF faculty and project stakeholders, which summarized this DNP project. A copy of this manuscript will be uploaded into the University of Saint Francis Doctor of Nursing Practice repository for future reference.

Chapter 4: Results and Outcomes Analysis

Data Collection Techniques

Data for this project was collected in two different manners. The first data collection was a pre-test and post-test survey that was distributed to all colorectal surgeons who attended the January monthly colorectal surgery meeting (Appendix A). The surveys were collected by the project manager after they were completed. The second data collection and analysis were conducted by PRMC's quality department and aggregate data was shared with the project manager. This aggregate data included all elective colorectal surgery ERAS inpatients at PRMC during the months of October 2019, November 2019, December 2019, January 2020, February 2020, and March 2020 and measured whether two or more non-opioid analgesics were used during the postoperative period.

Measures/Indicators

Pre-test and post-test surveys included baseline demographic data, more specifically, age of colorectal surgeon and number of years in colorectal surgery practice. The survey also

included a Likert Scale and a question and written answer section to assist in identifying themes and possible barriers to prescribing two or more non-opioid analgesics postoperatively.

The PRMC quality department collected and analyzed ERAS data daily, which included the number of non-opioid analgesics prescribed to each scheduled colorectal surgical patient. The quality department used this data to determine the percentage of patients overall for each month that met the ERAS recommendation of two or more non-opioid analgesics postoperatively.

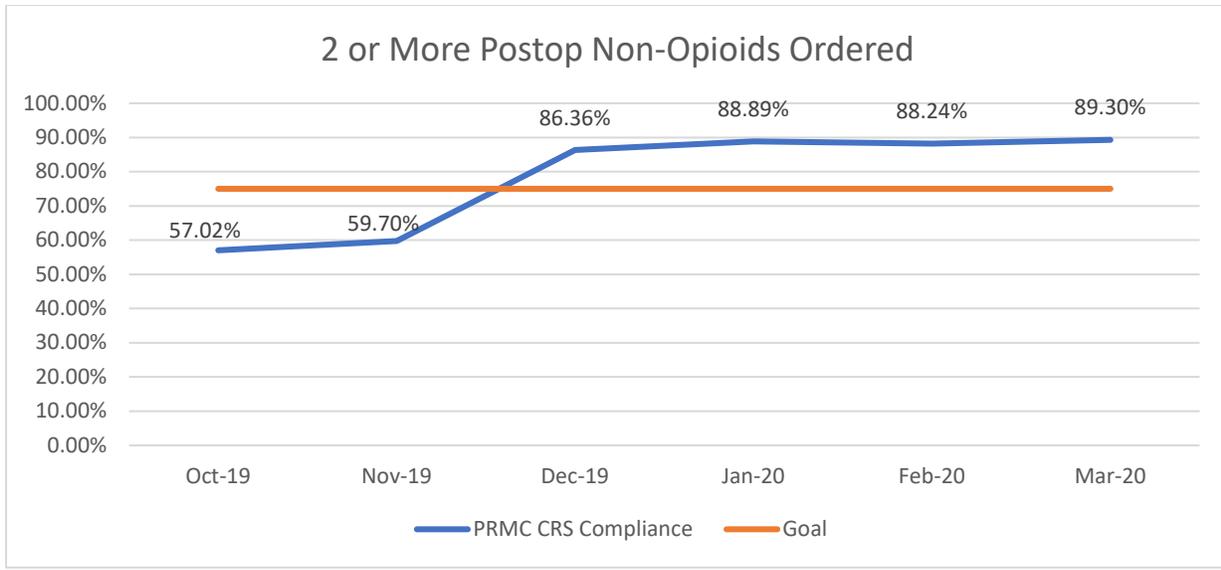
Desired outcomes for this project included identification of barriers to prescribing two or more non-opioid analgesics postoperatively for scheduled colorectal ERAS patients and increased prescribing of two or more non-opioid analgesics postoperatively for scheduled colorectal ERAS patients at PRMC. The pre-test and post-test surveys were used to help identify the barriers to prescribing and the aggregate data from the PRMC quality department was used to track the actual use, with hopes of meeting or exceeding the project goal of 75% or more compliance with ERAS recommendation of two or more non-opioid analgesics postoperatively.

Data Analysis Inferences

The pre- and post-presentation surveys were completed by three of the six possible PRMC colorectal surgeons, as only three attended the monthly sectional meeting in January 2020. Qualitative data was examined and showed that the colorectal surgeons answered each question the same on the pre-presentation survey versus the post-presentation survey, with the exception of one participant who added the use of Tramadol to his list of meds after the presentation. Many of the questions were also left blank by each participant. All participants passed on receiving more information regarding ERAS; however, all participants agreed that they wanted to receive outcome information from this project.

Like the qualitative data, the Likert scales from the pre- and post-presentation surveys also had no difference in answers. Each participant answered the exact same numbers on both surveys, therefore, there was no significant change in opinion regarding ERAS following project presentation or a null hypothesis. The correlation and t could not be computed by IBM SPSS Statistics 25 because the standard error of the difference is 0 or no change (Appendix J).

Aggregate data was analyzed by the PRMC quality department and shared with the project manager. Results were tracked each month with a goal of obtaining 75% or more compliance of two or more non-opioid analgesics postoperatively by project end. Unpredictably, compliance numbers increased above the project's goal one month before implementation and have sustained since that time, which infers that increased compliance was not directly related to the project's implementation in January 2020. However, other project interactions may have resulted in increased compliance. The project manager attended two ERAS meetings in October 2019 and November 2019 to introduce herself and the project to physicians, staff, and administration, which may have increased colorectal surgeon awareness of the non-compliance issue. The PRMC ERAS committee began focusing on several of the lowest compliance scores in the fall of 2019, which included ordering two or more postoperative non-opioid analgesics, the subject of this project. Increased focus on non-opioid analgesics within the organization may have increased colorectal surgeon awareness of the non-compliance issue. Therefore, there were most likely many influences that helped increase the scores and not only this project's presentation. However, the project may have had an indirect influence on the numbers by solidifying ERAS knowledge and encouraging the continuation of non-opioid analgesics postoperatively in the future.



(PRMC Quality Department, personal communications, October 2019-May 2020)

Gaps

Project goal of 100% colorectal surgeon participation with surveys and implementation was not met. In January 2020, only 50% of the surgeons were in attendance and participated in project implementation. However, informational handouts from the meeting were passed on to the other 50% of colorectal surgeons who were not in attendance via their practice manager, Jim Dougal. These informational handouts contained the current ERAS literature that was presented during the meeting. This small sample size inhibits the ability to generalize this project’s outcomes to a larger population and base new projects on its process.

Unanticipated Consequences

As stated earlier, percent compliance regarding ordering two or more non-opioid analgesics post-operatively increased above PRMC’s and project goal of 75% and has since sustained above that number. Meeting this goal is a success for PRMC, colorectal surgeons, and ultimately the patients who will benefit from ERAS guidelines. However, this feat was accomplished before project implementation, which means this project was not directly related to

PRMC's success. Instead, this project may be an indirect influence, as it may have increased and solidified the colorectal surgeons' ERAS knowledge of available medications at PRMC and broadened medication options to better tailor a regime for each patient.

Expenditures

A budget of \$50 was set at the beginning of this project to cover printing materials for project presentation in January 2020. The project manager printed materials at the University of Saint Francis at no cost; therefore, actual cost of the project was \$0.

Chapter 5: Leadership and Management

Organizational Culture

Institutional and Organizational Assessment (IOA) Model

The IOA Model is a framework developed to help organizations better understand and improve their performance (Universalia, 2020). The IOA Model is broken down into four key areas: organizational motivation, organizational performance, organizational capacity, and external environment (Universalia, 2020). These elements help organizations “identify needed changes or improvements, inform an organizational change or strategic planning initiative, and satisfy accountability and/or risk management requirements of major funders” (Universalia, 2020).

Organizational motivation. Serving northeast Indiana and northwest Ohio, PRMC employs over 13,000 employees and is the region's largest employer (Parkview Health, 2020). Parkview began as Fort Wayne City Hospital in 1878 and has since expanded into the Parkview Health system in 1995, including nine hospitals and a large network of primary care and specialty providers (Parkview Health, 2020). The Parkview Health system prides itself in being a community-owned, not-for-profit organization that gives back to the people of northeast

Indiana and northwest Ohio in a variety of ways (Parkview Health, 2020). Parkview is dedicated to the community it serves and strives to improve the health and well-being of it by “tailoring a personalized health journey to achieve your unique goals, demonstrating world-class teamwork as we partner with you along that journey, (and) providing the excellence, innovation and value you seek in terms of convenience, compassion, service, cost and quality” (Parkview Health, 2020). Leadership throughout the organization reinforce this vision, which is evidenced in employees’ attitudes, work ethic, and compassion. Incentives for employees include competitive pay, culture of caring, excellent benefits, semi-annual bonuses, loan repayment program for select professions, and a strong reputation within the community.

Organizational performance. Parkview’s effectiveness within the region is evidenced by growth on the north campus and around the Fort Wayne community including the Young Men’s Christian Association (YMCA), Fort Wayne TinCaps, and expansion of the Parkview Cancer Center and PRMC second tower. Parkview prides itself on stewardship and handles resources wisely. The system is also able to raise funds required to meet functional requirements in the short, medium, and long-term, to ensure inflow of financial resources is greater than outflow.

Organizational capacity. Program management is well established at Parkview including the ERAS team which helps develop, implement, and manage the ERAS program throughout the system. The ERAS team at Parkview is overseen by the unit manager and Vice President of Surgical Services. Regarding this project, all members of the team communicated throughout the process and leadership was supportive and present throughout the change process.

External environment. There are many political forces that affect the way a hospital delivers care from federal regulations to department management. At a local level, lack of

support from administration would cause a massive barrier to the program as they would be the driving force of change. Leadership buy-in would be the first step in implementing change within the Parkview system. Additionally, lack of buy-in from surgeons could also put a halt to the program, as they are the leaders of the surgical team and responsible for bringing patients to the operating room (AANA, 2017).

Within the hospital setting social forces come into play such as normal routines and the heavy direction from the physicians. Many staff members are quick to resist any form of change to their everyday routine. Staff may feel comfortable with their workflow and will create a resistance to change related to their limited understanding regarding the ERAS protocol (AANA, 2017). Physician staff may also be resistant to change for the same reasons or may encourage change of others, but not within their own workflow (Pedziwiatr et al., 2018). For patients, cultural barriers may play a part due to limited understanding of instructions regarding preoperative and discharge paperwork. Fort Wayne, Indiana is a remarkably diverse community and Parkview Regional Medical Center must adapt to the ever-changing population to ensure delivery of quality care.

At the end of the day, health care is a business. The hospital would not be able to keep its doors open if administration did not treat it as such. Administration and staff may feel the ERAS protocol will cost the hospital money in man-hours developing and implementing this program and perhaps it may decrease the number of surgical patients a day leading to less money earned. However, research has shown a \$880-5560 savings for patients, \$1,763 savings for the hospital per patient, decreased length of stay, and decreased 30-day readmission rate with ERAS which leads to cost savings for both the patient and the hospital (AANA, 2018; Watson, 2015).

Change Strategy

Havelock's Change Theory

Ronald Havelock's change theory is a modified version of Lewin's model of change and includes six phases: Building a relationship, diagnosing the problem, acquire resources for change, selecting a pathway for the solution, establish and accept change, and maintenance and separation (Udod & Wagner, 2018). Havelock believed that adding to Lewin's model would allow for the theory to be more applicable to real-life change management (Udod & Wagner, 2018).

Havelock's Change Theory Application

Phases of Change	Definition	Application to Project
Building a Relationship	<p>“Precontemplation”</p> <p>Need for change in the system is determined</p>	<p>Project manager is a former employee of PRMC and established relationships with the majority of stakeholders</p> <p>Discussions in July 2019 helped develop a need for change regarding ERAS</p>
Diagnosing the Problem	<p>“Contemplation”</p> <p>Change agent must decide if change is needed and/or desired</p>	<p>The need to meet benchmarks regarding ERAS non-opioid orders was identified</p>
Acquire Resources for Change	<p>Need for change is understood</p> <p>Solution development begins</p> <p>Gathering of information</p>	<p>ERAS non-opioid project was identified and understood</p> <p>Project manager reviewed current research and best practice recommendations</p>
Selecting a Pathway for the Solution	<p>Pathway of change is selected</p> <p>Implementation</p>	<p>Knowledge to Action Model & Havelock's Change Theory is used for implementation of this project</p>

<p>Establish and Accept Change</p>	<p>Manage resistance to change</p> <p>Change becomes part of new routine</p> <p>Ongoing communication, response strategies, education, and support must be included</p>	<p>This project was not met with resistance to change</p> <p>Project manager maintained communication with the ERAS coordinator post-implementation for support</p>
<p>Maintenance and Separation</p>	<p>Change agent monitors system to ensure change is stabilized and maintained</p> <p>Once change is the new “normal,” they can separate</p>	<p>Project manager monitored monthly ERAS statistics shared by the ERAS coordinator</p> <p>Statistics were monitored three months pre- and post-implementation. After three months, project manager separated from the project.</p>

(Udon & Wagner, 2018)

Leadership Style

Parkview Leadership Style

Parkview Health system has been under the leadership and direction of Chief Executive Officer and President, Mike Packnett for nearly 14 years (Parkview Health, 2020). In addition to Packnett, there are 44 additional members in Parkview’s senior leadership team and 21 board of director members, all of which have been long-time members of the Parkview family, as well as, active members in the Fort Wayne community (Parkview Health, 2020). This consistent and reliable leadership team only enhances the system by bringing solid ideas and goals to life. From many interactions with Parkview’s leadership, there is a clear democratic style of leadership within the system. Packnett takes in all feedback from fellow leaders of the company, as well as, employees when considering solutions to problems. This open communication radiates down to all departments and employees.

Project Manager Leadership Style

Like Parkview Health, the project manager also has a democratic or participative leadership style, which accepts input from the team, but retains the final verdict or say when choices are being made (Cherry, 2018). With this style of leadership, group members or employees are more likely to become motivated and encouraged (Cherry, 2018). Since every member of the team is an asset, decisions are more effective because no one person can be an expert of all topics (Cherry, 2018). Since Parkview Health and this project manager share the same leadership style, collaborating of this project has been smooth.

Interprofessional Collaboration

When we explore the health care interprofessional team, we must include several different areas of specialty such as nursing, medicine, pharmacy, therapy, and many others (Interprofessional Education Collaborative [IPEC], 2016). By coming together, these professionals can understand each other's competencies, knowledge, and how they contribute to the team. Fostering this understanding provides more seamless patient care and better outcomes. Two key elements of interprofessional collaboration are "(1) the construction of a collective action that addresses the complexity of client needs, and (2) the construction of a team life that integrates the perspectives of each professional and in which team members respect and trust each other" (D'amour, Ferrada-Videla, Rodriguez, & Beaulieu, 2005). Being able to come together and agree on a collective action to achieve a goal is what health care is about. For example, in the intensive care unit, a trauma patient requires many members of the health care team for care including trauma providers, intensivists, additional specialty providers as needed, nursing, pharmacy, case workers, physical therapy, respiratory therapy, et cetera. Proper

collaboration, planning, and action helps the patient recover more quickly and in the best way possible. Secondly, team life helps foster mutual respect and trust between professional teams.

For this ERAS project, interprofessional collaboration occurred between the project manager, leadership (both Parkview and USF), colorectal surgeons, Jenny Smith (PRMC quality department), Lisa House (PRMC ERAS coordinator), pharmacy, and the review boards (both Parkview and USF). Clear communication was established early in the project which set up the collaboration for success. During the implementation presentation, interprofessional collaboration between the project manager and colorectal surgeons was successful as all members worked together to improve the current statistics of ERAS non-opioid analgesic ordering.

Conflict Management

The most well-known conflict theory was that of Karl Marx which is still relevant today. Marx is known for founding the idea of socialism which can be linked to many events throughout history such as wars and revolutions, democracy and civil rights, wealth and poverty, and even capitalistic attempts to control the masses (Koop, 2019). From Marx's theory came many others including the conflict theory by Alan Sears which holds societal differences as the cause of conflicts rather than order and classes (Sociology Group, 2017). These societal differences initiate different points of view between people which can potentially create conflict.

For this project, anticipated conflict included resistance by the colorectal surgeons regarding requesting change to their current practice. Many times, physicians and surgeons are resistant to these requests by non-providers as they see it as "being told how to practice." The project manager was prepared for resistance. During the implementation phase, the project manager introduced herself, her education, and experience within the Parkview Health system, as

this would gain reputability and relatability since she has over twelve years of history at PRMC. The project manager also stated that she had worked in many colorectal surgical cases with the providers as a circulating Registered Nurse, as this may spark some previous memory of a professional collaboration. After the project manager introduction, the colorectal surgeons listened intently, were engaged, and asked multiple questions. Overall, the providers verbally stated they gained knowledge and were open to prescribing two or more non-opioid analgesics post-operatively. No conflicts arose during the presentation.

Unanticipated conflict during the project included change in project content at the last minute. Initially, the project was focused on increasing use of the colorectal ERAS order set for postoperative patients. PRMC decided to change its EMR and merge the colorectal postoperative order set and the colorectal ERAS order set into one, which negated the project's purpose. However, with the help of USF and PRMC administration, the project manager was able to change the focus of the project to its current subject.

Chapter 6: Discussion

Impact of Project

This quality improvement project was directly aimed at identifying barriers to use and increasing compliance at PRMC regarding ordering two or more non-opioid analgesics postoperatively for colorectal patients. The project not only helped PRMC meet this goal and maintain it, but it may have also affected the future of colorectal surgical patient outcome trends. Literature shows that the use of two or more non-opioid analgesics with ERAS provides many patient benefits including decreased postoperative opioid use, decreased length of stay, and decreased physiological stress response to surgery (AANA, 2018; ACP Hospitalist, 2017; Currie et al., 2016; Engelman et al., 2019; Greco et al., 2014; Li et al., 2017; McIsaac, Cole, &

McCartney, 2015). ERAS compliance has also demonstrated benefits to hospital organizations by decreasing length of stay by half or about two to three days, leading to an average cost savings of between \$880-\$5,560 for patients when ERAS protocols were initiated including decreased in room fees, laboratory fees, and other miscellaneous fees (Chipollini et al., 2017; Greco et al, 2014; Schmidt, El Lakis, Markar, Hubka, & Low, 2016; Xu et al., 2015). An average savings for the hospital of \$1,763 per patient is also significant considering the number of surgical patients they care for each year (Watson, 2015). This project may have a small part of these future successes for PRMC and their colorectal patients.

All eight of the Essentials of Doctoral Education for Advanced Nursing Practice were used within this project. More specifically, Essentials II (Organizational and Systems Leadership for Quality Improvement and Systems Thinking), III (Clinical Scholarship and Analytical Methods for Evidence-Based Practice), and VI (Interprofessional Collaboration for Improving Patient and Population Health Outcomes) were the main Essentials that were illustrated within this project (AACN, 2006). The project manager has learned how to plan, implement, and sustain a quality improvement project that effects an organization and community. All eight DNP Essentials will aid the project manager in the future when faced with a quality improvement opportunity at her workplace or in the community.

Decisions and Recommendations

The data from the pre- and post-presentation surveys were not statistically significant. However, one participant added the use of Tramadol to his list of medication options he will order for patients. The options for non-opioid analgesics were discussed during the presentation and the colorectal surgeons were surprised that Tramadol was on the list, which showed they may not have known all options available at PRMC. Intermittent education from the pharmacy

is recommended, to share available medications at PRMC with the colorectal surgeons.

Continued communication and education are also recommended to sustain compliance to current ERAS recommendations.

Limitations of the Project

One limitation of the project was only half of the colorectal surgeons attended the January 2020 meeting and participated in the project. The small sample size made it difficult to generalize statistics. Another limitation was the busy schedule of the project manager since she was also in clinical rotations in the operating room across three different states during the project period. Limited availability made it difficult for the project manager to attend monthly ERAS meetings regularly and difficult to meet stakeholders in person consistently.

Application to Other Settings

This project could be used for any quality improvement initiative because it uses simple quality improvement and change principles to accomplish a goal. Not only could this framework be used for other quality improvement projects within health care, but it could also be used in any other professional setting. The Knowledge to Action framework and Havelock's Change Theory are very generic and can fit any potential project matter. This project also uses simple methods for quality improvement: Identify the problem, review evidence-based research, formulate action plan, implement, continuous reassessment, and sustain. These simple steps can be used for any project within health care or outside of health care.

Strategies for Maintaining and Sustaining

The project manager's and PRMC's future goal is continued ERAS compliance at PRMC and the continuation of positive colorectal patient outcomes. It is recommended that continued communication and education be shared with colorectal surgeons, especially when changes arise.

This communication is vital in maintaining ERAS compliance above 75% regarding two or more non-opioid analgesics postoperatively.

Lessons Learned

The key to success for any doctoral project is to be flexible. Every strong plan will have bumps no matter how flawless it seems. From the beginning, this project was moving in a promising direction, when suddenly around the time of IRB submission, everything needed to be changed. Flexibility is the key to redirecting any unplanned change and it is important not to dwell on the past. The project manager learned that determination and perseverance will get her through the rough and unpredictable roads, and with a little faith, the project would eventually be complete!

Chapter 7: Conclusion

Potential Project Impact on Health Outcomes Beyond Implementation Site

The success of this project will not only affect PRMC but may also carry on beyond the main campus. This quality improvement project can be used as a framework for Parkview community sites, with the potential of affecting thousands of people in northeast Indiana and northwest Ohio, improving outcomes, decreasing length of stay, decreasing opioid use, and potentially saving patients and Parkview thousands of dollars. Once the initial change of “normal” practice is solidified, the use of two or more non-opioid analgesics should become routine best practice.

Health Policy Implications of Project

With insurance companies and Center for Medicare and Medicaid Services (CMS) determining reimbursement for hospitals, it would not be surprising if research-based ERAS recommendations become quality drivers for colorectal surgery reimbursement in the future.

Typically, these quality drivers are research-based and outline minimal standards that are required to be reimbursed for services. It is quite possible that ERAS becomes a part of this trend as well. It would be in the best interest of all hospitals to begin to meet these standards now and solidify their practice not only to be one step ahead of possible health policy change, but to also strive for research-based, best practice that improves patient outcomes.

Proposed Future Direction for Practice

It is recommended that this quality improvement project be used as an outline for future Parkview Health ERAS projects to improve monthly compliance scores. The project outline was used at PRMC and can also be used as a guide at Parkview community hospitals across northeast Indiana and northwest Ohio to guide the process. Continued communication and education with the surgeons and affected staff would be helpful to maintain and sustain this quality improvement change. Future projects could focus on different key drivers that need statistical improvement or different participants such as nurses on the surgical floor who administer the medications to the patients to identify a different perspective on barriers to use.

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Appendix A - Survey
Enhanced Recovery After Surgery (ERAS) Survey

Demographic info

Unique Identifier # _____

Age _____

Number of years in CRS practice _____

*Please answer, on a scale of 0-5, how much you agree with the following statements:
 0=Not at all, 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.
 Please circle your answer.*

1. ERAS is a valid evidenced based practice protocol that provides many benefits to patients and hospitals.	0	1	2	3	4	5
2. I have a firm knowledge base of ERAS protocol and steps.	0	1	2	3	4	5
3. Ordering 2 non-opioid analgesics decreases post-operative opioid use.	0	1	2	3	4	5
4. Scheduled doses of Tylenol help reduce postoperative pain.	0	1	2	3	4	5
5. Scheduled doses of Toradol or Motrin help reduce postoperative pain.	0	1	2	3	4	5
6. Scheduled doses of Gabapentin help reduce postoperative pain.	0	1	2	3	4	5
7. Postoperative TAP blocks would help reduce postoperative pain.	0	1	2	3	4	5
8. Low dose Lidocaine drips would help reduce postoperative pain.	0	1	2	3	4	5
9. ERAS makes my job harder.	0	1	2	3	4	5
10. ERAS has a negative effect on my patients.	0	1	2	3	4	5

11. What is working well and not working well regarding postoperative pain management for your colorectal surgical patients?

Appendix A (Continued) - Survey

12. Do you routinely order 2 or more non-opioid analgesics for your surgical patients? Why or why not? What do you prescribe?

13. What are some barriers to ordering 2 or more non-opioid analgesics for your surgical patients?

14. What additional information or materials are you interested in receiving regarding multimodal pain management for postoperative colorectal patients?

15. Are you interested in receiving outcome information from this project?

Appendix B – Informed Consent
**Enhanced Recovery After Surgery:
Identifying and Overcoming Barriers to Ordering Postoperative Non-Opioid Analgesics
Parkview Regional Medical Center (PRMC)
Quality Improvement (QI) Project Informed Consent**

Introduction: Jen Hager, MBA, BSN, RN, SRNA is a student at the University of Saint Francis pursuing her Doctor of Nursing Practice. This project is part of her doctoral requirements for degree completion. Jen Hager is advised by Dr. Marsha King, Dean of University of Saint Francis, Crown Point campus.

Purpose of Project: The purpose of this project is to identify barriers to ordering Enhanced Recovery After Surgery (ERAS) protocol recommended two or more non-opioid analgesics postoperatively and increase the use of non-opioid analgesics postoperatively at Parkview Regional Medical Center, Fort Wayne, Indiana. ERAS is an evidence-based protocol used for surgical patients for multiple benefits including decreased opioid use and decreased length of stay. ERAS has been shown to optimize the surgical experience and promote healing. This improvement project's goal is to increase the number of ERAS patients at Parkview Regional Medical Center who receive two or more non-opioid analgesics to help decrease opioid use, decrease length of stay, and to optimize the patient's surgical experience and healing. In signing this document, you are giving your consent for Jen Hager to collect aggregate data received through the quality department of Parkview Regional Medical Center. You will also be asked to fill out forms or answer questions measuring barriers to ordering, as well as, to evaluate knowledge regarding ERAS.

Procedures: This project will include colorectal surgeons at Parkview Regional Medical Center, Fort Wayne, Indiana. A pre-presentation survey will be used to evaluate barriers to use for ERAS. A presentation during the colorectal monthly section meeting will occur to discuss barriers and benefits of the recommendation. A post-presentation survey will be included to reassess barriers to ordering. Statistics will then be analyzed through the quality department to measure the use of the ERAS protocol for scheduled colorectal inpatients.

Potential Risks and Benefits: There are no risks for the practitioner identified. Benefits include increased knowledge and understanding of ERAS protocol and benefits.

Confidentiality: Confidentiality will be maintained as all surveys will be anonymous which cannot be linked to your name or identity, so the project staff will not know who has answered. In addition, all patient information will be kept anonymous by the quality department of Parkview Regional Medical Center. Information that will be abstracted will simply be statistical information and will not include any patient information or patient identifiers.

Paper forms for surveys are identified by assigned numbers to protect practitioner identity. Papers will be shredded once data is transferred to an Excel spreadsheet. All data will be stored on Jen Hager, SRNA's personal computer including the list that identifies participants and assigned identification numbers until August 2020. The personal computer is password protected and locked when not in use by Jen Hager, SRNA.

Voluntary Participation: Participation in the project is voluntary. You may withdraw your permission for the use of your responses at any time without penalty. A signed copy of this consent will be given to you.

Appendix C – Project Budget

Enhanced Recovery After Surgery Project Budget - Jen Hager				
	Legend	Direct Costs		
		In-Kind Costs		
Project Expenses				
Salaries and Wages	Description	Year 1	Year 2	Total
DNP Project Manager - Jen Hager		\$ -	\$ -	\$ -
DNP Project Advisor - Dr. King		\$ -	\$ -	\$ -
PRMC Surgery Manager - K. Miller		\$ -	\$ -	\$ -
PRMC ERAS coordinator - L. House		\$ -	\$ -	\$ -
PRMC quality department - J. Smith		\$ -	\$ -	\$ -
CRS Practice Manager - J. Dougal		\$ -	\$ -	\$ -
CRS Surgeons		\$ -	\$ -	\$ -
Total Salary Costs		\$ -	\$ -	\$ -
Supplies and Materials	Description	Year 1	Year 2	Total
Printing materials	Informed Consent/surveys	\$ -	\$ 50.00	\$ 50.00
				\$ -
				\$ -
Total Supplies and Materials		\$ -	\$ 50.00	\$ 50.00
Total Expenses		\$ -	\$ 50.00	\$ 50.00
Project Revenue				
	Description	Year 1	Year 2	Total
Total Project Revenue		\$ -	\$ -	\$ -
Project Benefit/Loss				
Total Revenue		\$ -	\$ -	\$ -
Less Expenses		\$ -	\$ 50.00	\$ 50.00
Total Project Benefit/Loss		\$ -	\$ (50.00)	\$ (50.00)

Appendix D – Project Timeline

Project Timeline

- December 2019: Develop presentation.
- January 2020: Administer pre-presentation survey to colorectal surgeons to identify themes regarding barriers to use of ERAS protocol recommended, two or more non-opioid analgesics post-operatively. Implement presentation. Administer post-presentation survey.
- February 2020: Review pre- and post-presentation survey results. Compare scores from pre-presentation survey versus post-presentation surveys. Evaluate extracted data from quality department.
- March 2020: Evaluate extracted data from quality department.
- April 2020: Evaluate extracted data from quality department.

Appendix E – Letter of Support
From Kristen Miller, Surgery Manager, Parkview Regional Medical Center



PARKVIEW
REGIONAL MEDICAL CENTER

9/17/19

To the University of Saint Francis Institutional Review Board:

This letter is being written in support of University of Saint Francis DNP-NAP Jennifer Hager's Doctor of Nursing Practice Scholarly Project entitled "Increasing Use of Enhanced Recovery After Surgery." Parkview understands that the aims of the DNP Scholarly Project are to increase colorectal surgeons' and nurse practitioners' knowledge of the Enhanced Recovery After Surgery protocol and increase its use at Parkview Regional Medical Center.

Parkview is supportive of the aims of the project. Parkview will allow Jennifer Hager to administer surveys, education, and pre and posttests to colorectal surgeons and nurse practitioners at Parkview Regional Medical Center. Parkview will also allow Jennifer Hager to work with the quality department to extract data and allow access to electronic medical records if needed for statistical purposes.

Parkview and its leadership are committed to providing evidence-based care at the bedside to improve patient outcomes. We are looking forward to working with Jennifer Hager on her Doctor of Nursing Practice Scholarly Project, "Increasing Use of Enhanced Recovery After Surgery," to continue to provide excellent care to the Fort Wayne and surrounding areas.

Sincerely,

Kristen Miller RN BSN
Perioperative Manager
North Surgery, Preop Clinic
260-266-3702
Kristen.Miller2@Parkview.com

Appendix F – CITI Training Certificates



Completion Date 04-Aug-2019
Expiration Date 03-Aug-2022
Record ID 32664543

This is to certify that:

Jen Hager

Has completed the following CITI Program course:

GCP – Social and Behavioral Research Best Practices for Clinical Research (Curriculum Group)
GCP – Social and Behavioral Research Best Practices for Clinical Research (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

University of Saint Francis



Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w1b902817-c791-43d5-9606-ed5f00808bfa-32664543



Completion Date 05-Aug-2019
Expiration Date N/A
Record ID 32664541

This is to certify that:

Jen Hager

Has completed the following CITI Program course:

Information Privacy Security (IPS) (Curriculum Group)
Researchers (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

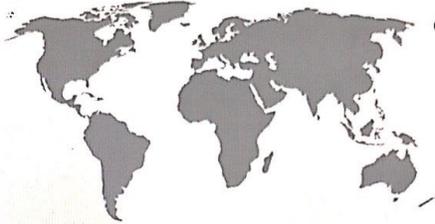
University of Saint Francis



Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wb2e1144d-8f36-4ef8-9313-a1392398577b-32664541

Appendix F (Continued) – CITI Training Certificates



Completion Date 05-Aug-2019
Expiration Date 04-Aug-2022
Record ID 32664544

This is to certify that:

Jen Hager

Has completed the following CITI Program course:

Public Health Research (Curriculum Group)
Public Health Research (Course Learner Group)
1 - Basic (Stage)

Under requirements set by:

University of Saint Francis



Verify at www.citiprogram.org/verify/?wae88562c-d395-4f6e-9e1b-809e9dc24b14-32664544



Completion Date 09-Aug-2019
Expiration Date 08-Aug-2022
Record ID 32664540

This is to certify that:

Jen Hager

Has completed the following CITI Program course:

Social & Behavioral Research - Basic/Refresher (Curriculum Group)
Social & Behavioral Research (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

University of Saint Francis



Verify at www.citiprogram.org/verify/?w38e9f432-5eb3-4db4-80c5-1dcf97eafaf7-32664540

Appendix F (Continued) – CITI Training Certificates



Completion Date 05-Aug-2019
Expiration Date 04-Aug-2022
Record ID 32664542

This is to certify that:

Jen Hager

Has completed the following CITI Program course:

Social and Behavioral Responsible Conduct of Research (Curriculum Group)
Social and Behavioral Responsible Conduct of Research (Course Learner Group)
1 - RCR (Stage)

Under requirements set by:

University of Saint Francis



Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w8b2952cb-855c-486e-bc25-ae85ce9c932d-32664542

*Appendix G – IRB Exemption from Parkview Regional Medical Center***RE: DNP Project**

Jan Powers <Jan.Powers@parkview.com>

Fri 9/13/2019 7:41 AM

To:

- Hager, Jennifer L <WalshJL@cougars.sf.edu>

WARNING: This email originated from outside of USF. Do **NOT** click links or attachments unless you recognize the sender and know the content is safe.

Thanks Jen. I read over your proposal. I think this is an excellent project and look forward to seeing your outcomes. Based on what you plan to do with this project, from my perspective I don't see that it would require IRB approval from Parkview to proceed, really can be addressed from EBP/QI. However, if there is an intention to publish or present the results after the project, it would probably be a good idea to get IRB approval.

Jan

From: Hager, Jennifer L [mailto:WalshJL@cougars.sf.edu]

Sent: Thursday, September 12, 2019 10:07 AM

To: Jan Powers <Jan.Powers@parkview.com>

Subject: Re: DNP Project

****WARNING**** This email originated from outside of Parkview Health.

DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Hi Jan!

I am working with Kristen Miller (surgery manager) and Jim Dougal (CRS manager). I'll be also contacting Lisa House (ERAS coordinator).

University of Saint Francis requires me to apply to IRB, unless Parkview feels like it is unnecessary! In that case, I would just relay that to USF.

Thanks so much!

Jen

Appendix G (Continued) - IRB Exemption from Parkview Regional Medical Center

From: Jan Powers <Jan.Powers@parkview.com>
Sent: Thursday, September 12, 2019 9:57:18 AM
To: Hager, Jennifer L <WalshJL@cougars.sf.edu>
Cc: Danielle Payne <Danielle.Payne@parkview.com>
Subject: RE: DNP Project

WARNING: This email originated from outside of USF. Do **NOT** click links or attachments unless you recognize the sender and know the content is safe.

Thank you Jen. Sorry if I already asked this – who are you working with at Parkview as your mentor? Are you required for school to go through IRB?

Thanks,
Jan

From: Hager, Jennifer L [<mailto:WalshJL@cougars.sf.edu>]
Sent: Wednesday, September 11, 2019 7:06 PM
To: Jan Powers <Jan.Powers@parkview.com>
Subject: DNP Project

****WARNING**** This email originated from outside of Parkview Health.

DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Hi Jan!

Please see attachment for my DNP Project summary for the NREBP committee. Let me know if you have any questions. I will be working on my IRB next!

Thanks,
Jen Hager, SRNA
University of Saint Francis

Appendix H – DNP Scholarly Project Final Approval Form

**University of Saint Francis
Institutional Review Board
Human Subjects Review Committee/ACUC/IBC
Institutional Review Board Approval Form**

Protocol Number: 157035-HSRC

Review by (underline one): HSRC ACUC IBC

Date Reviewed: 10/09/2019 (with further electronic review through 10/21/2019)

Principal Investigator: Jennifer Hager

Faculty Advisor: Dr. Marsha King

Protocol Title: Enhanced Recovery After Surgery: Identifying and Overcoming Barriers to Ordering Postoperative Non-Opioid Analgesics

Study Site(s): Parkview Regional Medical Center

Items submitted for review:

- CITI Certificate
- Initial protocol
- Abstract
- Informed Consent Form (if applicable)
- Approval letter from outside institution – PRMC Surgery Center, PRMC (email approval)
- Other – explain: Data collection measures

Type of Review:

- Full Review
- Expedited Review
- Exempt Review

Approval:

- Approval granted on _____
- Approval granted on _____ for a period of one year.
- Conditional approval* granted on 10/22/2019.
- Not approved*
- Other

*Comments: Address the following IRB concerns before you begin your project and data collection.

- Potentially identifying demographic questions – demographic questions appear to be unnecessary to study purpose and data analysis and the combination of data increases risk of participant identification, particularly with such a small sample. Consider which are absolutely essential to the study purpose.
- Given that you will be extracting patient data for analysis, we ask that you verify again whether you need to obtain IRB approval from Parkview.
- If data, especially patient data, will be stored on a personal computer, in addition to password protection of the computer, the data files must also password protected.

The committee performing this review is duly constituted and operates in accordance and compliance with local and federal regulations and guidelines.

Stephanie Oetting

Stephanie Oetting

10/22/2019

Printed Name (Chair or designee)

Signature

Date

IRB Committee Approval Form sjo 10/15/2019



Appendix I – Presentation Handout

Enhanced Recovery After Surgery:
Identifying and Overcoming Barriers to Ordering Postoperative Non-Opioid Analgesics

Jen Hager, MBA, BSN, RN, SRNA
University of Saint Francis
January 14, 2020

1. Project Manager Introduction**2. Summary of DNP Project and Goals**

- a. Enhanced Recovery After Surgery (ERAS) protocol originated in 1997 in Belgium and was used to decrease patients' stress response, optimize physiologic function, and facilitate recovery after gastrointestinal surgery (AANA, 2017). The protocol is patient-centered, evidence-based, and includes a multidisciplinary team including the patient, surgeon, anesthesia, nursing, and therapies such as physical therapy and occupational therapy. ERAS features a continuum of care beginning at home and rotating through preadmission, preoperative unit, operating room, postoperative unit, and ending at home again.
- b. This quality improvement project will be focusing on identifying and overcoming barriers to ordering two or more postoperative non-opioid analgesics, a component of the ERAS protocol.
- c. Goal: Increase ERAS non-opioid statistics to 75% compliance by project end (April 1, 2020)

3. Benefits of ERAS Protocol: Patient, Surgeon, and Hospital

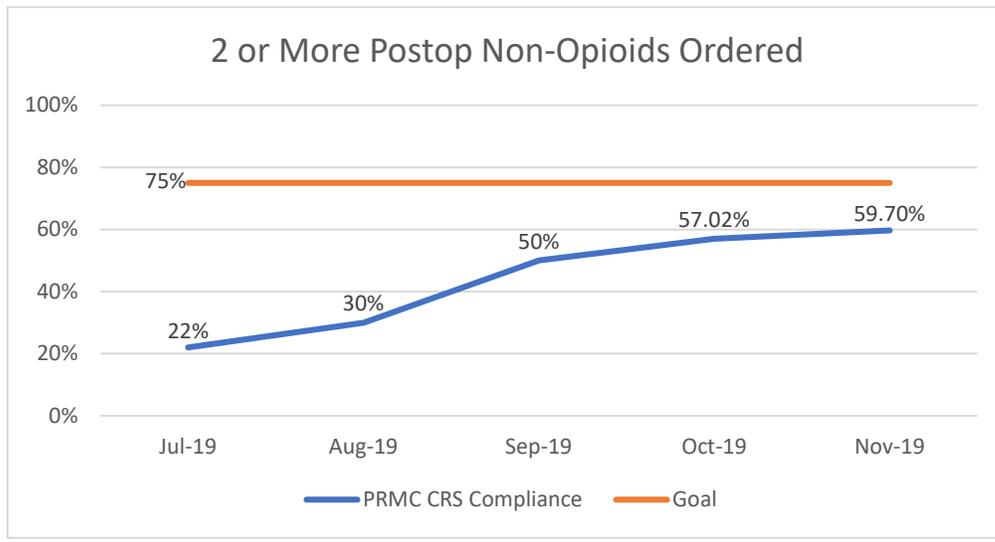
- a. Literature regarding post-operative opioid use
 - i. ERAS focuses on multi-modal pain management to avoid perioperative-related drivers of the opioid crisis and avoid reliance on traditional opioids
 - ii. Opioids are associated with sedation, nausea, vomiting, respiratory depression, and ileus
 - iii. ERAS has been shown to decrease postoperative opioid use and related complications
 - iv. Medications including Ofirmev, tramadol, gabapentin, dexmedetomidine, ketamine, and peripheral nerve blockade all decreased the use of opioids post-operatively
 - v. Patients who follow the ERAS protocol consume a significantly lower amount of opioids per day postoperatively, as low as ¼
 - vi. A multimodal approach supports early mobilization, quicker return of bowel function, and less postoperative complications
(AANA, 2018; AANA, 2019; ACP Hospitalist., 2017; Currie et al., 2016; Engelman et al., 2019; Greco et al., 2014; Gustafsson et al., 2019; Li et al., 2017; McIsaac, Cole, & McCartney, 2015; Stone, Wick, Wu, & Grant, 2017; Xu et al., 2015; Zafar, Davies, Greenslade, & Dixon, 2010)
- b. Literature regarding length of stay (LOS)
 - i. Decreased LOS results in cost savings for the patient and hospital system
 - ii. ERAS patients were shown to decrease their LOS by two to three days and others decreased their LOS by about half
 - iii. Patients save between \$880-\$5560 when ERAS protocols are initiated
 - iv. Hospitals have an average per patient cost savings of \$1,763
(AANA, 2018; AANA, 2019; Greco et al., 2014; Watson, 2015; Xu et al., 2015)
- c. Literature regarding other benefits
 - i. Significant findings regarding decreased incidence of post-operative ileus, noting a decrease of incidence of about one third
 - ii. Several meta-analyses also note significant data regarding postoperative morbidity decreased by 40-50% with ERAS
(Xu et al., 2015)

Appendix I (Continued) – Presentation Handout

- 4. Current ERAS Recommendations Regarding Post-Operative Pain** (Gustafsson et al., 2019)
- a. LIDOCAINE GTT:
 - i. *Summary and recommendation:* Lidocaine infusions can reduce opiate consumption after surgery, whether the treatment reduces the risk of postoperative ileus remains unclear.
 - ii. *Quality of evidence:* Use of lidocaine infusions to reduce opiate consumption after surgery: High
 - iii. *Recommendation:* Strong
 - iv. *Dose:* Lidocaine 1.5-3mg/kg/h depending on bolus given (0-1.5mg/kg)
 - b. MULTIMODAL PAIN MEDS:
 - i. *Summary and recommendation:* Avoid opioids and apply multimodal analgesia in combination with spinal/epidural analgesia or TAP blocks when indicated
 - ii. *Quality of evidence:* Moderate
 - iii. *Recommendation grade:* multimodal opioid-sparing analgesia: Strong
 - c. TAP BLOCK:
 - i. *Summary and recommendation:* Small RCTs in laparoscopic colorectal and other surgeries show that TAP blocks reduce opioid consumption and improve recovery. Optimal pain relief appears to depend on the extent of spread within the fascial plane, which in turn is dependent on the type, volume, duration of action of injectate and the accuracy with which the correct plane is identified. Both ultrasound-guided and laparoscopic approaches have been described.
 - ii. *Quality of evidence:* Moderate
 - iii. *Recommendation grade:* TAP blocks in minimally invasive surgery: Strong
 - d. *THORACIC EPIDURAL ANALGESIA (TEA; T7-T10):*
 - i. *Summary and recommendation:* TEA using low dose of local anesthetic and opioids is recommended in open colorectal surgery to minimize the metabolic stress response and provide analgesia postoperatively. In patients undergoing laparoscopic surgery, TEA can be used, but cannot be recommended over several alternative choices.
 - ii. To attenuate the neuro-endocrinal stress response:
 1. *Quality of Evidence:* Laparotomy: High
 2. *Recommendation:* Strong
 3. *Quality of Evidence:* Laparoscopy: Low
 4. *Recommendation:* weak
 - iii. To provide optimal analgesia
 1. *Quality of Evidence:* Laparotomy: High
 2. *Recommendation:* strong
 3. *Quality of Evidence:* Laparoscopy: Moderate, for not using it
 4. *Recommendation:* strong for not using it.
 - iv. Low-dose local anesthetic and opioids:
 1. *Quality of Evidence:* Moderate
 2. *Recommendation:* Strong
 - v. To improve postoperative non-analgesic outcomes
 1. *Quality of Evidence:* Recovery of bowel function: High, for using it
 - e. SPINAL ANESTHESIA
 - i. *Summary and recommendation:* Spinal anesthesia with low-dose opioids gives good analgesic effects, has a transient stress-reducing effect, and allows postoperative opiate sparing and is recommended as an adjunct option to general anesthesia in laparoscopic surgery.
 - ii. *Quality of evidence:* moderate
 - iii. *Recommendation:* strong

Appendix I (Continued) – Presentation Handout

5. Current Colorectal ERAS Statistics and Goal



6. Current Non-Opioid Medications Available at PRMC

- a. Tylenol/Ofirmev
- b. NSAIDs: Ibuprofen, Celebrex, Toradol
- c. Tramadol
- d. Gabapentin
- e. Precedex
- f. Lidocaine gtts (intraop/postop)
- g. TAP Blocks (with or without On-Q)
- h. Epidurals
- i. Spinals

7. Questions

Appendix I (Continued) – Presentation Handout

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Appendix J – Data Analysis Plan

Aim 1: Identify barriers to prescribing the ERAS protocol recommended two or more non-opioid analgesics postoperatively

Variable	Brief Description	Data Source	Possible Range of Values	Level of Measurement	Time for Collection	Statistical Test
Question/answer	Multiple questions regarding ERAS	Pre and post-presentation surveys		Qualitative	November 2019 & January 2020	Qualitative
Likert Scale	Multiple questions regarding ERAS	Pre and post-presentation surveys	0=not at all 1=strongly disagree 2=disagree 3=neutral 4=agree 5=strongly agree	Likert	November 2019 & January 2020	t-test

Aim 2: Increase prescribing of two or more non-opioid analgesics for scheduled colorectal surgical patients at PRMC.

Variable	Brief Description	Data Source	Possible Range of Values	Level of Measurement	Time for Collection	Statistical Test
Percent of scheduled CRS ERAS patients who were ordered 2 or more non-opioid analgesics postoperatively	% of patients ordered 2 or more non-opioid analgesics postop	Data from PRMC quality dept	0-100	Continuous	Monthly from October 1, 2019-March 31, 2020	Baseline data comparison

Appendix K – Data Analysis Results (Aim 1)

Pre and Post-Presentation Survey: T-Test

Aim 1: Identify barriers to prescribing the ERAS protocol recommended two or more non-opioid analgesics postoperatively

Notes

Output Created		16-MAY-2020 19:08:37
Comments		
Input	Data	C:\Users\jenho\OneDrive\Documents\USF\DNP3\SurveyStats.sav
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Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on the cases with no missing or out-of-range data for any variable in the analysis.
Syntax	<pre>T-TEST PAIRS=PREvalid PREknowledge PREdecreasePain PREtylenol PREtoradolmotrin PREgabapentin PREtap PRElidogtt PREjobharder PREnegeffectonpts WITH POSTvalid POSTknowledge POSTdecreasePain POSTtylenol POSTtoradolmotrin POSTgabapentin POSTtap POSTlidogtt POSTjobharder POSTnegeffectonpts (PAIRED) /CRITERIA=CI(.9500) /MISSING=ANALYSIS.</pre>	
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	Elapsed Time	00:00:00.01

Appendix K (continued) – Data Analysis Results (Aim 1)

Warnings

The Paired Samples Correlations table is not produced.

The Paired Samples Test table is not produced.

		Paired Samples Statistics			
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRE Test ERAS is valid	5.00 ^a	3	.000	.000
	POST Test ERAS is valid	5.00 ^a	3	.000	.000
Pair 2	PRE Test Firm Knowledge	5.00 ^a	3	.000	.000
	POST Test Firm Knowledge	5.00 ^a	3	.000	.000
Pair 3	PRE Test Decreases Pain	5.00 ^a	3	.000	.000
	POST Test Decreases Pain	5.00 ^a	3	.000	.000
Pair 4	PRE Test Tylenol Decreases Pain	5.00 ^a	3	.000	.000
	POST Test Tylenol Decreases Pain	5.00 ^a	3	.000	.000
Pair 5	PRE Test Toradol/Motrin Decreases Pain	5.00 ^a	3	.000	.000
	POST Test Toradol/Motrin Decreases Pain	5.00 ^a	3	.000	.000
Pair 6	PRE Test Gabapentin Decreases Pain	5.00 ^a	3	.000	.000
	POST Test Gabapentin Decreases Pain	5.00 ^a	3	.000	.000
Pair 7	PRE Test TAP blocks	5.00 ^a	3	.000	.000
	POST Test TAP blocks	5.00 ^a	3	.000	.000
Pair 8	PRE Test Lidocaine Drips	4.33 ^a	3	.577	.333
	POST Test Lidocaine Drips	4.33 ^a	3	.577	.333
Pair 9	PRE Test ERAS Makes My Job Harder	.33 ^a	3	.577	.333
	POST Test ERAS Makes My Job Harder	.33 ^a	3	.577	.333
Pair 10	PRE Test Negative Effect on Pts	.33 ^a	3	.577	.333
	POST Test Negative Effect on Pts	.33 ^a	3	.577	.333

a. The correlation and t cannot be computed because the standard error of the difference is 0.

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