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The Implementation of a Postoperative Opioid-Sparing Guideline

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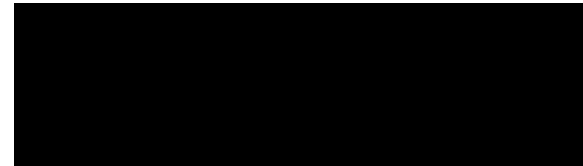
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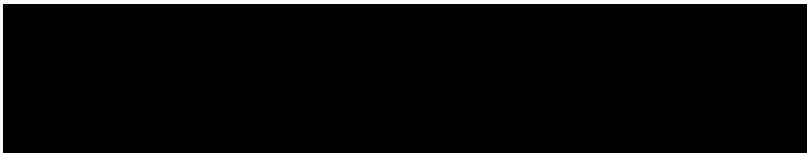
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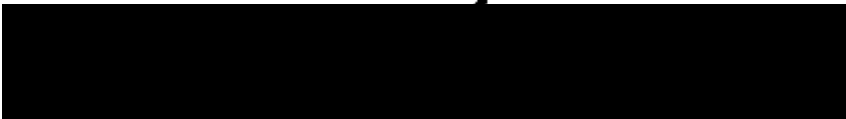
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Disclaimer:

Due to the impact of the COVID19 Pandemic, 2020 graduates of the Daniel K. Inouye Graduate School of Nursing were deemed critical to the mission of caring for the health of the nation. All phases of the DNP Project were complete, and met the standards and rigors of a quality DNP Project with an abbreviated dissemination timeframe.

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Abstract

Phase II Site: Naval Medical Center San Diego (NMCS D), San Diego, CA

Project Title: The Implementation of a Postoperative Opioid-Sparing Guideline

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Background: The observed practice of registered nurses in the Post-Anesthesia Care Unit (PACU) at Naval Medical Center San Diego (NMCS D) was opioid administration as a first-line treatment for pain management. In addition, the PACU lacked a standardized postoperative opioid-sparing guideline for the adult population. The purpose of this project was to design and implement a standardized opioid-sparing guideline and order set to reduce opioid administration during the PACU period.

Clinical Question: In adult surgical patients at NMCS D, does an opioid-sparing guideline for PACU analgesia, compared to current practice, reduce opioid administration at one and three months?

Project Design: This project was implemented in the PACU at NMCS D, a large military medical treatment facility. An opioid-sparing guideline and order set was designed using a systematic literature review, preexisting NMCS D Enhanced Recovery After Surgery (ERAS) pathways, non-opioid adjuncts available in NMCS D's pharmacy formulary, and expert opinion. The guideline was presented to the anesthesia and PACU departments. Post-implementation opioid administration data was collected at one and three months.

Data Analysis: A total of 94 patients who underwent elective hysterectomies were included in the final data analysis. There was an 8% increase in non-opioid adjunct utilization by PACU staff following guideline implementation. An independent-samples t-test was used to determine the difference in opioid administration following project implementation. A statistically significant

difference in opioid administration between the pre-implementation ($M = 6.70$, $SD = 7.90$) and post-implementation ($M = 12.92$, $SD = 13.00$; $t(68.69) = -2.69$, $p = .01$, two-tailed) groups indicated the opioid-sparing guideline did not result in less opioid administration by PACU nursing staff.

Organizational Impact: The education and implementation of an opioid-sparing guideline did not reduce overall opioid administration by PACU staff; however, the utilization of non-opioid adjuncts did increase. The initiation of this evidence-based project called attention to the PACU practices and intention to better align PACUs pain management with NMCS D's ERAS pathways. Consequently, it highlighted the importance of the evaluation process following the implementation of a change.

Introduction

Enhanced Recovery after Surgery (ERAS) pathways have become increasingly prevalent with the primary goal of optimizing patient outcomes without compromising quality of care (Kamdar et al., 2017). The implementation of ERAS pathways that integrate opioid-sparing analgesia modalities in the perioperative period can potentially improve perioperative pain management, decrease the total length of hospital stay, and subsequent cost of care (Kamdar et al., 2017; Wick et al., 2017). The anesthesia and surgical departments at Naval Medical Center San Diego (NMCS D) partnered to create facility specific evidence-based ERAS pathways for patients undergoing colorectal, gynecological (GYN), bariatric, and total joint procedures. In response to the growing utilization of these ERAS pathways, a multidisciplinary team was created to evaluate the impact these pathways had upon perioperative opioid administration, particularly in the Post-Anesthesia Care Unit (PACU). From this, team members identified opioid administration was the first-line treatment for pain management by PACU nurses. In addition, the PACU did not have a standardized postoperative opioid-sparing guideline for the adult population. Therefore, NMCS D leadership requested the design and implementation of a standardized opioid-sparing guideline and order set to not only decrease opioid administration, but to better align PACUs pain management with NMCS D's ERAS pathways.

Significance of the Problem

According to the Centers for Disease Control and Prevention (CDC), the United States performs an estimated 48 million inpatient surgeries, with an additional 53.5 million surgical and non-surgical procedures in ambulatory visits each year (Gordon et al., 2016). With more than 80% of patients experiencing acute postoperative pain, less than half reported adequate postoperative pain relief (Chou et al., 2016). Of note, opioids were the most popular analgesic

option for management of postoperative pain (Kamdar et al., 2017; Tan et al., 2014). Although opioids are highly effective forms for pain control, they have the potential to increase length of stay (LOS) due to adverse side effects, such as postoperative nausea and vomiting, respiratory depression, pruritus, urinary retention, sedation, and ileus (Ziemann-Gimmel et al., 2014). Tan et al. (2014) reported opioid-related adverse events resulted in higher adjusted mean costs (\$22,077 vs. \$17,370 USD) and increased LOS and readmission rates. Opioids may also be less efficacious for long-term postoperative pain control due to tolerance development and subsequent opioid-induced hyperalgesia (Tan et al., 2014). Additionally, opioid-related side effects can negatively impact patient satisfaction, prompting patients to request non-opioid alternatives (Tan et al., 2014).

Non-opioid analgesic options have been reported to reduce opioid consumption while effectively controlling pain and limiting opioid-related side effects (Wick et al., 2017). The development of many pharmacologic and non-pharmacological modalities to address acute postoperative pain have expanded in the recent years (Cooney, 2016). An evidenced-based clinical practice guideline developed by the American Pain Society provides recommendations supported by high-quality evidence for the use of multimodal therapies to treat postoperative pain (Chou et al., 2016). Early intervention with non-opioid adjuncts in the perioperative period can reduce overall opioid consumption (Chou et al., 2016; Kamdar et al., 2017). A multimodal approach to utilizing non-opioid analgesics may also produce additive or synergistic effects to provide sufficient pain control versus opioids alone (Chou et al., 2016; Koh, Nguyen, & Jahr, 2015; Wick et al., 2017).

PACU registered nurses are primarily responsible for administering analgesics and managing postoperative pain. A factor that has limited the administration of non-opioid

alternatives is an educational deficit regarding these options among nurses (Cooney, 2016; Hong-Gu et al., 2010). Consequently, the education of PACU nurses and implementation of an evidence-based postoperative opioid-sparing guideline may increase the utilization of non-opioid medications and lessen opioid administration. By limiting the amount of opioids administered to surgical patients, it may reduce the LOS in the PACU while improving patient outcomes (Cooney, 2016).

Clinical Question

In adult surgical patients at NMCS D, does an opioid-sparing guideline for PACU analgesia, compared to current practice, reduce opioid administration rates at one and three months?

Focus Areas

The Evidence-Based Practice (EBP) project team targeted several focus areas. First, a postoperative opioid-sparing guideline and order set were created after conducting a systematic literature review, evaluation of NMCS D ERAS protocols, and consultation with anesthesia pain specialists. Second, the team educated the PACU staff on the opioid-sparing guideline and non-opioid alternatives. Third, postoperative opioid administration was evaluated one and three months following the education and implementation of the opioid-sparing guideline. Fourth, project results were disseminated to the anesthesia department and PACU leadership for evaluation and potential recommendations to further reduce overall PACU administration in the future.

Relevance to Military Nursing

Military Certified Registered Nurse Anesthetists (CRNAs) are the primary providers of anesthesia care to U.S. military personnel on the front lines, navy ships, and aircraft evacuation

teams around the globe (Certified Registered Nurse Anesthetist Fact Sheet, 2019). In addition, they are the bridge between surgical physicians and PACU nursing staff placing them in a unique position to have a significant impact upon opioid utilization perioperatively.

NMCS D performs an average of 50 surgical procedures daily (“About Us,” n.d.). Additionally, 44% of the wounded veterans from operations in Iraq and Afghanistan experience chronic pain (Vallerand, Cosler, Henningfield, & Galassini, 2015). The inappropriate use of opioids can lead to unexpected side effects and consequences such as increased recovery time, considerably affecting the readiness of the war fighting troops. Other negative consequences include loss of work hours from delayed recovery and inadequate pain control leading to limitations of duty impacting flight status and deployability, ultimately increasing the risk of transition to a chronic pain state (Vallerand, Cosler, Henningfield, & Galassini, 2015). Recommendations from the American Association of Nurse Anesthetists (AANA) suggests that reducing opioids perioperatively can potentially reduce PACU LOS and overall length of hospital stay, thus reducing costs and medical resource utilization (AANA, 2016; AANA, 2017). The overall impact upon the military health system (MHS) can be substantial and potentially effects manpower, fiscal budgeting, and overall readiness.

MHS beneficiaries benefit from opioid-sparing guidelines as it aligns to the Better Care of the MHS Quadruple Aim. This aim supports achieving value-base care that transforms the enterprise into a High Reliability Organization (HRO). This is achieved through utilizing the most current evidence-based literature to effect practice guidelines and altering longstanding dogma to improve quality care (DHA 2017 Stakeholder Report, 2018; Vallerand et al., 2015; Wick et al. 2017).

Organizing Framework

The Iowa Model of Evidence-Based Practice to Promote Quality Care was chosen to aid in the development of this EBP project. The model consists of three major decision points: defining a priority topic, whether the subject possesses enough evidence, and can the change implemented be appropriately sustained (Iowa Model Collaborative et al., 2017).

The priority topic identified was the design and implementation of an opioid-sparing guideline and order set in the PACU. Literature was collected and appraised, and based upon relevant evidence, a postoperative opioid-sparing guideline and order set was developed, followed by education of the PACU staff on non-opioid alternatives and application of the guideline. The goal was to reduce the number of opioids administered and enhance PACU nurses' knowledge in the immediate postoperative period.

Project Design

General Approach

The primary goal of this project was to reduce postoperative opioid administration following PACU staff education and implementation of a postoperative opioid-sparing guideline and order set. Potential barriers to implementation were lack of buy-in from stakeholders and staff resistance to change. Barriers were overcome by a close multidisciplinary collaboration between the EBP team, anesthesia department, and PACU nursing leadership. This created an environment where all stakeholders understood the rationale behind the project and the potential long-term impact.

Setting

This project was conducted at NMCSO, a large military treatment facility in southwest California. The PACU within the surgery department was the primary setting of interest. The

PACU department consisted of 15 patient recovery beds and was staffed by 14 registered nurses and 11 hospital corpsmen.

Procedural Steps

Evidence Evaluation

A literature search was completed through multiple electronic databases, specifically, PubMed, EMBASE, and CINAHL. Other resources included current NMCS D ERAS pathways and clinical guidelines, the ERAS Society, non-opioid adjuncts on formulary at NMCS D, and NMCS D expert consultation. The search was limited to peer-reviewed studies, articles in the press, printed in English, and from 2006 to present. The year 2006 was determined as the starting point due to relatively new research on opioid-sparing anesthesia. The inclusion criteria consisted of adult populations undergoing outpatient procedures utilizing multimodal anesthesia techniques, specifically opioid-free or opioid-sparing. Exclusion criteria included inpatient, pediatrics, and complementary alternative medicine techniques.

A systematic approach was utilized to perform the literature search to maintain consistency and objectivity. The search consisted of the following search terms: “anesthesia,” “ambulatory surgery,” “enhanced recovery after surgery,” “ERAS,” “opioid-free,” “opioid-sparing,” “outpatient surgery,” and “same day surgery.” The initial search yielded 720 articles from all three databases. After removing duplicate authors and titles, 440 articles remained. The titles and abstracts were further evaluated by all members of the group reducing the total to 74 articles for full-textual review. The final seven articles were determined for qualitative appraisal (Appendix B).

Data from the articles were placed into an evidence table. Every project member read through the seven articles assigning a level of evidence based upon the rating system by

Melynyk and Fineout-Overholt (2015). Next, each article was further appraised utilizing clinical appraisal tools developed through the Centre of Evidence-Based Medicine. This ensured inter-rater reliability to maintain uniformity during the appraisal process.

The postoperative opioid-sparing guideline and order set were designed using current literature, preexisting ERAS pathways, expert opinion from anesthesiology pain specialists, PACU leadership, and NMCS D pharmacy formulary. Guidance for which medications should be given for mild, moderate, and severe pain were based on Visual Analogue Scale (VAS) scores. The design was tailored to ensure that non-opioid adjuncts were given first for mild pain. In patients with moderate pain, opioids were introduced in lower doses, administering oral (PO) prior to intravenous (IV) route, in combination with interventions in the mild pain category. For severe pain, higher doses of opioids were added for pain not controlled by previous interventions (Appendix D).

Implementation Details

Following the development of the postoperative opioid-sparing guideline and order set, a presentation was given to the anesthesia department leadership. Upon approval from the NMCS D anesthesia department, the guideline was disseminated during department meetings and email announcements. The EBP team coordinated with the PACU clinical nurse educator and scheduled training times to provide education to the PACU staff via PowerPoint and handouts. The training discussed proper application of the opioid-sparing guideline, specifically highlighting the utilization of non-opioid adjuncts. Once all PACU staff received the training, a laminated guideline was posted at each PACU recovery bed station. Following this, the opioid-sparing guideline and order set was implemented into the clinical setting.

Following project implementation, team members conducted retrospective chart reviews at one and three months to collect total PACU opioid administration. Total opioids were then converted to morphine equivalents using the Practical Pain Management Opioid Calculator to standardize measurements for all patients. All project data was entered into a Microsoft Excel database, including patients that were identified using the daily operating room schedule. Secondary outcomes, such as non-opioid medications administered, ERAS compliance, and PACU LOS, were also collected to satisfy additional outcome measures requested by the anesthesia department leadership. Data was uploaded into the Statistical Package for the Social Sciences program (version 24.0) for final analysis. Lastly, all data was maintained on a government computer and double password protected.

The results of this project were presented to the NMCS D anesthesia department staff, project leaders, PACU stakeholders, and faculty stationed NMCS D via PowerPoint presentation and discussion session. Furthermore, an abstract for podium and poster presentation was accepted for the 2020 Tri-Service Nursing Research Program (TSNRP) Dissemination Course. In the interim, sustainability was not determined until reengagement with the anesthesia and PACU stakeholders, to include reevaluation of the current guideline and PACU order set.

HIPAA Concerns

This DNP project involved the collection of basic demographic data and opioid administration amounts; however, the collection of personally identifiable information (PII) did not occur. There were no violation concerns regarding the Health Insurance Portability and Accountability Act of 1996 (HIPAA). As a health care delivery improvement project, it received IRB exemption from NMCS D (Appendix E).

Project Results

All elective hysterectomy surgeries requiring a general anesthesia were included in the final data analysis. This approach was taken in order to ensure similar group composition before and after project implementation, particularly since all hysterectomy cases maintained high compliance with ERAS pathways and were managed pharmacologically and surgically in a similar fashion perioperatively. As a result, a total of 94 patients that underwent elective hysterectomies were included for final analysis, with 49 patients in the pre-implementation group and 45 patients in the post-implementation group.

The mean age in the pre- and post-implementation groups were 42.3 and 41.7, respectively (Appendix F). ERAS compliance was similar between the two groups with the pre-implementation group at 69% compliance and post-implementation group at 68%. Non-narcotic adjunct utilization increased by 8%, from 24% in the pre-implementation group to 33% in the post-implementation group. Additionally, post implementation administration of ketamine increased by 29%. Moreover, overall recovery times in the PACU increased by 23%, where the pre-implementation group averaged 94 minutes and the post-implementation group averaged 117 minutes, respectively.

The project's primary outcome was total opioid administration in the PACU before and after project implementation. An independent-samples t-test was used to determine the differences in opioid administration between groups. A statistically significant difference in total opioid administration between the pre-implementation ($M = 6.70$, $SD = 7.90$) and post-implementation ($M = 12.92$, $SD = 13.00$; $t(68.69) = -2.69$, $p = .01$, two-tailed) groups indicated the opioid-sparing guideline did not reduce opioid administration.

Discussion

The implementation of our opioid-sparing guideline did not influence the reduction of PACU opioid administration, rather patients received significantly more opioids in the postoperative period. A contributing factor for these results could be varied guideline adherence following implementation. First, the guideline required the PACU staff to utilize other interventions prior to the use of opioids under the moderate pain category. For example, for patients with VAS scores of 5, the PACU nursing staff may have administered 25 mcg IV fentanyl neglecting the previous adjuncts outlined in the mild pain category within the guideline. Initial anecdotal discussions with the PACU staff identified resistance to the guideline, which required additional education and training. Second, the possibility of varied utilization of the order set by anesthesia staff. This could have limited the PACU nursing staff's full flexibility of the guideline. For example, anesthesia providers may have not ordered any options in the minimal pain category and only opioids within the moderate and severe categories. Despite department announcements, emails, and training sessions one month before implementation, it may not have fully captured all the anesthesia providers for uniformity due to staff turnover during the implementation period.

Ketamine was one pharmacological adjunct that was added to the opioid-sparing guideline that was not previously available in PACU orders. Due to the known profound analgesic effects, increased utilization of ketamine by 29% could be presumed to result in less opioid utilization. However, results from our project found total opioid utilization was significantly greater following the guideline implementation. One potential contributing factor is ketamine is known to cause the patient to feel detached from sensations and surroundings due to its hallucinogenic, tranquilizing, and dissociative effects (Buvanendran & Kroin, 2007). The

PACU nurses may have misinterpreted these dissociative effects of ketamine as pain and treated it with opioids, thus appropriately following the steps in our guideline. Moreover, nursing's lack of experience with the pharmacology of the non-opioid adjuncts, specifically ketamine, may have resulted in an increased amount of opioid utilization following ketamine administration.

Further evaluation of the literature suggests the guideline dosing for postoperative ketamine may have been higher than necessary. There are no clear milligrams per kilograms models; however, some recommendations suggest dosages between 0.15-0.5mg/kg for a single bolus dose (Jougelet-Lacoste, Colla, Schilling, & Chelly, 2015). The increased ketamine dosing in our current PACU order set could have contributed to more adverse side effects, as well as increased PACU times and opioid administration.

Despite literature suggesting ERAS pathways reducing overall PACU LOS, this project showed an increase in the post-implementation group (Tan, Law, & Gan, 2014). It is likely the prolonged LOS is reflective of the increased opioid administration, which is consistent with our literature review.

Organizational Impact / Implications for Practice & Policy

The education and implementation of an opioid-sparing guideline did not provide the intended organizational impact of reducing opioid administration in the immediate postoperative period; however, the utilization of non-opioid adjuncts did increase. It demonstrated that interdepartmental and interdisciplinary collaboration and support is vital to promote change in practice and to increase the awareness and use of alternative pain management strategies. The initiation of this evidence-based project called attention to the PACU practices and intent to better align PACUs pain management with NMCS D's ERAS pathways. Re-evaluation of medication dosing within the order set and education for anesthesia providers and PACU nurses

could decrease opioid administration in the future. By reducing opioid administration, the negative side effects associated with opioids may decrease thereby improving clinical outcomes and patient satisfaction (Kamdar, Hoftman, Rahman, & Cannesson, 2017).

Future Directions for Practice & Research

There are several areas of improvement that may contribute to better outcomes and future adherence to the guideline among PACU nursing staff and anesthesia providers. Adherence was potentially decreased for a multitude of reasons such as inadequate number of training sessions and staff turnovers. This could have led to either an educational deficit regarding the administration of non-opioid alternatives or both a lack of experience and confidence in the side effects and pharmacology of non-opioid adjuncts. Future recommendations to focus on an improved education and follow-up strategy, including other surgical populations, and future projects encompassing a longer implementation period should be explored. Potentially we could further collaborate with other clinical areas, like the emergency department, that administer ketamine routinely for pain control to contribute toward appropriate dosing for the guideline. Finally, conduct a post survey to PACU staff may have provided better insight to reasons why PACU staff were not adhering to the guidelines.

Conclusion

Although the education and implementation of an opioid-sparing guideline did not reduce overall opioid administration, it revealed utilization of non-opioid adjuncts by PACU nursing did increase compliance with NMCSO's ERAS pathways. The implementation of an opioid-sparing guideline improved PACU nursing staff knowledge and confidence utilizing non-opioid adjuncts. Multiple factors may have influenced the guideline adherence. Reconnection with the

stakeholders will need to be conducted to determine revision of the guideline. As new evidence emerges regarding this topic, it will strengthen potential changes in the guideline in the future.

References

About Us. (n.d.). Retrieved from

<https://www.med.navy.mil/sites/nmcsd/pages/command/command-about-us.aspx>

American Association of Nurse Anesthetists. (2016). A Holistic Approach to Pain Management: Integrated, Multimodal, and Interdisciplinary Treatment. Retrieved March 26, 2018, from <http://www.aana.com/resources2/professionalpractice/Pages/A-Holistic-Approach-to-Pain-Management.aspx>.

American Association of Nurse Anesthetists. (2017). ERAS. Retrieved from

<http://www.aana.com/resources2/professionalpractice/Pages/ERAS-Resources.aspx#articles>.

Buvanendran, A., & Kroin, J. S. (2007). Useful adjuvants for postoperative pain management.

Best Practice and Research in Clinical Anaesthesiology, 21(1), 31-49. doi:

10.1016/j.bpa.2006.12.003

Centre for Evidence Based Medicine. Critical appraisal tools. (2018, January 25). Retrieved from

<https://www.cebm.net/2014/06/critical-appraisal/>

Chou, R., Gordon, D. B., Leon-Casasola, O. A., Rosenberg, J. M., Bickler, S., Brennan, T., . . .

Wu, C. L. (2016). Management of Postoperative Pain: A Clinical Practice Guideline from the American Pain Society, the American Society of Regional Anesthesia and Pain Medicine, and the American Society of Anesthesiologists Committee on Regional Anesthesia, Executive Committee, and Administrative Council. *The Journal of Pain*, 17(2), 131-157. doi: 10.1016/j.jpain.2015.12.008

- Christie, C., Baker, C., Kennedy, P., Bondi, P., Cooper, R., Madras, B. (2017). Presidents Commission on combating drug addiction and the opioid crisis. Washington D.C. Retrieved from whitehouse.gov. Sept. 13, 2018.
- Cooney, M. F. (2016). Postoperative Pain Management: Clinical Practice Guidelines. *Journal of PeriAnesthesia Nursing*, 31(5), 445-451. doi: 10.1016/j.jopan.2016.08.001
- Certified Registered Nurse Anesthetist Fact Sheet (2019). Retrieved from <https://www.aana.com/membership/become-a-crna/crna-fact-sheet>DHA 2017 Stakeholder Report. Published 1 May 2018.
- Dillon, D. (2018). Week 3: Change Theories [PowerPoint slides]. Retrieved from Uniformed Services University Health Sciences, Translation of Evidence Sakai: <https://learning.usuhs.edu/>
- Gordon, D. B., Leon-Casasola, O. A., Wu, C. L., Sluka, K. A., Brennan, T. J., & Chou, R. (2016). Research Gaps in Practice Guidelines for Acute Postoperative Pain Management in Adults: Findings from a Review of the Evidence for an American Pain Society Clinical Practice Guideline. *The Journal of Pain*, 17(2), 158-166. doi: 10.1016/j.jpain.2015.10.023
- Hong-Gu, H., Riawati, J., Tat-Leanf, L., Emily Neo, K.A., Rajamaal, S., Katri, V.J., Moon, F.C. (Aug 16, 2010). Nurses 'use of non-pharmacological methods in children's postoperative pain management: educational intervention study. *JAN, Vol. 66 issue 11*. Pgs. 2398-2409. <https://doi-org.lrc1.usuhs.edu/10.1111/j.1365-2648.2010.05402.x>
- Iowa Model Collaborative, Buckwalter, K. C., Cullen, L., Hanrahan, K., Kleiber, C., McCarthy, A. M., Tucker, S. (2017). Iowa model of evidence - based practice: Revisions and

validation. *Worldviews on Evidenced - Based Nursing*, 14(3), 175–182.

<https://doi.org/10.1111/wvn.12223>

Jouguelet-Lacoste, J., Colla, L. L., Schilling, D., & Chelly, J. E. (2015). The Use of Intravenous Infusion or Single Dose of Low-Dose Ketamine for Postoperative Analgesia: A Review of the Current Literature. *Pain Medicine*, 16(2), 383–403. doi: 10.1111/pme.12619

Kamdar, N. V., Hoftman, N., Rahman, S., & Cannesson, M. (2017). Opioid-Free Analgesia in the Era of Enhanced Recovery After Surgery and the Surgical Home: Implications for Postoperative Outcomes and Population Health. *Anesth Analg*, 125(4), 1089-1091. doi:10.1213/ane.0000000000002122

Khobrani, M. A., Camamo, J. M., & Patanwala, A. E. (2017). Effect of intravenous acetaminophen on post-anesthesia care unit length of stay, opioid consumption, pain, and analgesic drug costs after ambulatory surgery. *Pt*, 42(2), 125-139.

Koh, W., Nguyen, K. P., & Jahr, J. S. (2015). Intravenous non-opioid analgesia for peri- and postoperative pain management: a scientific review of intravenous acetaminophen and ibuprofen. *Korean journal of anesthesiology*, 68(1), 3-12.


Melnyk, B. M., & Fineout-Overholt, E. (2015). *Evidence-based practice in nursing & healthcare: A guide to best practice*. Philadelphia, PA: Wolters Kluwer.

Tan, M., Law, L. S., & Gan, T. J. (2014). Optimizing pain management to facilitate Enhanced Recovery After Surgery pathways. *Canadian Journal of Anesthesia/Journal Canadien Danesthésie*, 62(2), 203-218. doi:10.1007/s12630-014-0275-x

Vallerand, A. H., et al. (2015). "Pain management strategies and lessons from the military: A narrative review." *Pain Research and Management* 20(5).

- White, S., & Spruce, L. (2015). Perioperative Nursing Leaders Implement Clinical Practice Guidelines Using the Iowa Model of Evidence-Based Practice. *AORN Journal*, 102(1), 50-59. doi: 10.1016/j.aorn.2015.04.001
- Wick, E. C., Grant, M. C., & Wu, C. L. (2017). Postoperative Multimodal Analgesia Pain Management with Nonopioid Analgesics and Techniques: A Review. *JAMA Surg*, 152(7), 691-697. doi:10.1001/jamasurg.2017.0898
- Ziemann-Gimmel, P., Goldfarb, A. A., Koppman, J., & Marema, R. T. (2014). Opioid-free total intravenous anaesthesia reduces postoperative nausea and vomiting in bariatric surgery beyond triple prophylaxis. *Br J Anaesth*, 112(5), 906-911. doi:10.1093/bja/aet551

Appendix A: Citi Certificates of Authors



Completion Date 28-Aug-2017
 Expiration Date 27-Aug-2020
 Record ID [REDACTED]

This is to certify that:

Jason Balazs

Has completed the following CITI Program course:

OUUSD P&R Human Research	(Curriculum Group)
Biomedical Investigators and Research Study Team	(Course Learner Group)
1 - Biomedical Investigators	(Stage)


Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)



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Completion Date 26-Aug-2017
 Expiration Date 25-Aug-2020
 Record ID [REDACTED]

This is to certify that:


Joy Bautista

Has completed the following CITI Program course:

OUUSD P&R Human Research	(Curriculum Group)
Biomedical Investigators and Research Study Team	(Course Learner Group)
1 - Biomedical Investigators	(Stage)



Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)



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OUSD P&R Human Research	(Curriculum Group)
Biomedical Investigators and Research Study Team	(Course Learner Group)
1 - Biomedical Investigators	(Stage)

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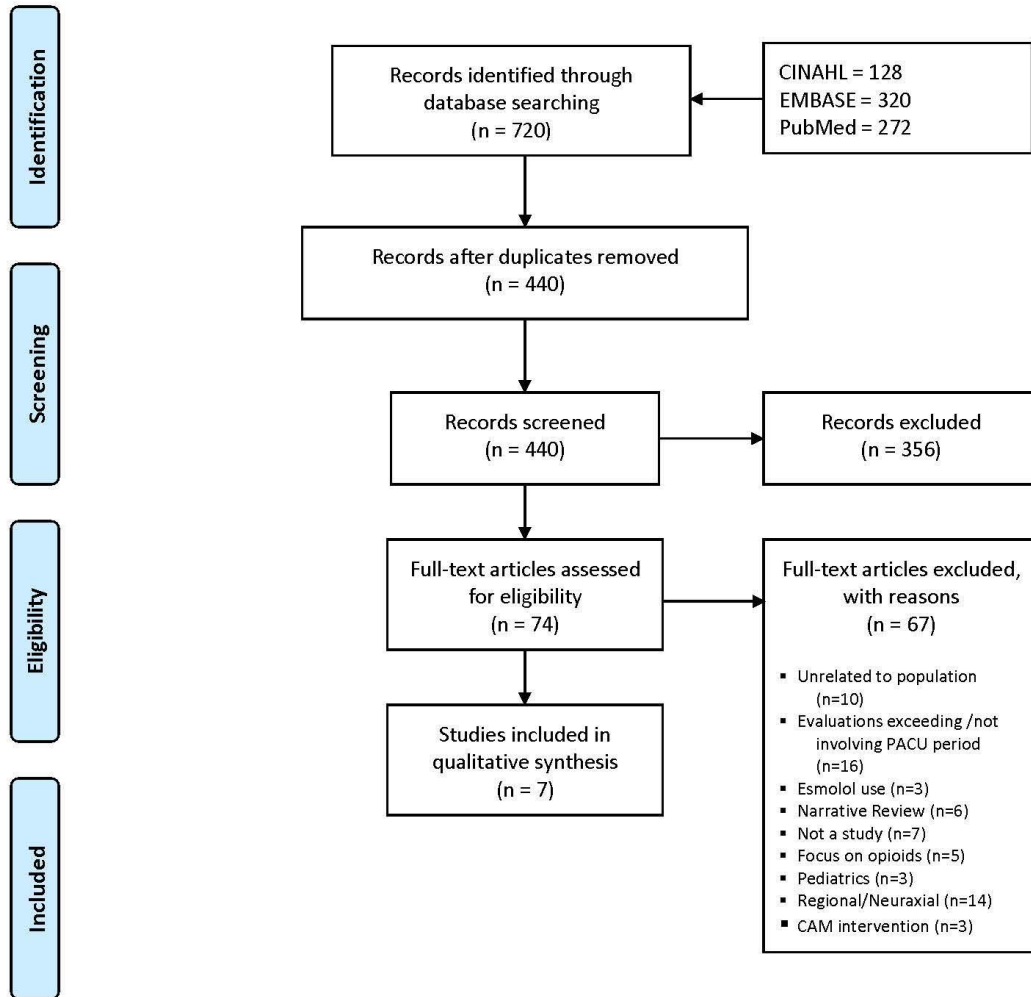

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Appendix B: Prisma Diagram & Evidence Table



PRISMA 2009 Flow Diagram



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit www.prisma-statement.org.

Article (Title, Author, Year) Country	Design & Level of Evidence	Sample / Population (IV & DV)	Methods (Stat Tests)	Results	Limitations	Overall Synthesis: Quality/Quantity/Consistency
Useful adjuvants for postoperative pain management Buvanendran, A., 2007 USA	Literature review based off the physiology of how medications work Level: V	None	Does not state a method is more of a physiological reference for how each medication listed	Textbook data, not a study more less a learning resource.	Not a study.	Very low, just covered the mechanism of actions of certain medications. No study data applied. Ditch
A Comparison of Multimodal Analgesic Approaches in Institutional Enhanced Recovery After Surgery Protocols for Colorectal Surgery: Pharmacological Agents Helander, E. M., 2017 USA	Comparison, cohort study Level: IV	No human subjects, no outcomes measured Comparison of ERAS protocols for colorectal surgery	5 protocols: American Society for Enhanced Recovery 10 protocols: direct contact/google search	Meds used: Pre: acetaminophen, celecoxib, gabapentin Intra: ketamine, lidocaine, magnesium, ketorolac Post Op: acetaminophen, NSAIDs, opioids	Specific to colorectal surgery Only North American institutions & one non-NA institution	Yes, comparison of 15 ERAS protocols (listed) to be utilized as reference & included references Quality: Not an evidence-based study, simply a comparison study, opinion; no outcomes Quantity: No evaluation of European/Asian protocols Consistency: Comparison between perioperative periods across each of the protocols Good info for guideline/order set
Opioid-Free Analgesia in the Era of Enhanced Recovery after Surgery and the Surgical Home: Implications for Postoperative Outcomes and Population Health Kambar, N. V., 2017 USA	Expert opinion Level: VII	N/A-	Opinion on how opioid free or sparing must be an entire hospital process.	Together with ERAS hospitals need to streamline pre-op to out pt. to limit opioids	Expert opinion	Good info for guideline/order set
Effect of Intravenous Acetaminophen on Post-Anesthesia Care Unit Length of Stay, Opioid Consumption, Pain, and Analgesic Drug Costs After Ambulatory Surgery Khobrani, M.A., 2017 USA	Retrospective cohort study Level: IV IRB approved at university	Time frame: Jan 2014-Jan 2015 - July 2014: IV APAP removal d/t cost Size: 174 patients DV: primary: LOS in PACU, secondary: pain score, opioid consumption, and total cost of analgesic in PACUs IV: 87 with APAP (Jan-Jun), 87 without Jul-Jan2015)	One ambulatory surgery center for ENT procedures Data collected by EMRs = Research Electronic Data capture (REDCap) All data analyses on Stata 13	Similar demographics between the two groups APAP did not reduce LOS, opioid consumption Significant analgesic drug costs	Bias: one of the authors received grant funding from Mallinckrodt Pharmaceuticals – makers of IV APAP - only EENT MDs used in the facility No written protocol in place for pain management	Maybe. Addresses ambulatory/outpatient populations Demonstration of gap toward a standardized postop management & research in this patient population. Concerns of bias (Financial, profession) Quality: Difficult for comparison due to lack of similar studies Quantity: Concerns of difficulty for generalizability Consistency: Adjunct administration was at discretion of provider, which was not evaluated. Discussion of which EENT procedures performed was also not discussed

Article (Title, Author, Year) Country	Design & Level of Evidence	Sample / Population (IV & DV)	Methods (Stat Tests)	Results	Limitations	Overall Synthesis: Quality/Quantity/Consistency
Dexamethasone decreases oxycodone consumption following osteotomy of the first metatarsal bone: a randomized controlled trial in day surgery Mattila, K., 2010 Europe: Scandinavia	Randomized, double-blinded placebo controlled	DV: Total oxy consumption POD 3 for 50 patients undergoing first metatarsal removal IV: 9mg of dexamethasone delivered 60-90 min pre-op and 24h post VS Placebo at same intervals.	Primary outcome was measurement of total oxycodone (5mg tablets) to PO day 3. Secondary outcomes were maximal pain scores prior to oxycodone rescue and daily oxycodone use. Oxycodone consumption used a Mann-Whitney with Bonferroni correlation. Pain scores at home used t-test.	Total Oxycodone consumption in dexamethasone group median 45mg compared with 45mg in placebo (PO day0-3) Pt self-reported pain scores lower prior to oxycodone rescue in dex group vs placebo.	Self-reporting pain score from home, pts still took oxycodone with self-reported pain scores less than 3, PACU nurse follow up only on morning after surgery, only 25 in each group. >90% women in both groups. No information on why 9mg dosing. FOR US- pre-operative doses of dexamethasone and steroids	Keep- Good info especially if Precedex going to be a multimodal approach. Talks about glucocorticoids and benefits 1-2 hrs. prior to surgery (less inflammation less pain)
Perioperative celecoxib decreases opioid use in patients undergoing testicular surgery: A randomized, double-blind, placebo-controlled trial Mehta, A., 2013 USA	Double-blind study Level: IV	Sample size was 75 initially however, poor follow up and on received 40% of data. The data is skewed for the lack of 100% accountability. IV: patients received Celebrex pre-testicular surgery DV: Patients reporting less pain after procedure on a pain score from 0-10.	Sample size very small only 75 people where only 30 returned questionnaires	Only 35 people returned info	small sample and lack of participation.	Bad data based off the lack of patients complying with returning of information. Recommend that we not use this study.
Postoperative Multimodal Analgesia Pain Management With Nonopioid Analgesics and Techniques: A Review Wick, E. C., 2017 USA	Comparison study Level: V	Discusses technique and medications versus integrating populations.	Teaches techniques and covers the physiology of how drugs work.	Teaching medications and techniques	Not a study, but a pharmacological and block handbook	Basically, is an introduction to pharmacology as well as neuraxial technique.

Appendix C: Form 3202N

USUHS FORM 3202N
DANIEL K. INOUE GRADUATE SCHOOL OF NURSING
EVIDENCE-BASED PRACTICE/PERFORMANCE IMPROVEMENT PROPOSAL

VPR Date Stamp

Project Number: _____ (VPR will assign)

Project Title: **The Implementation of a Postoperative Opioid-Sparing Guideline**

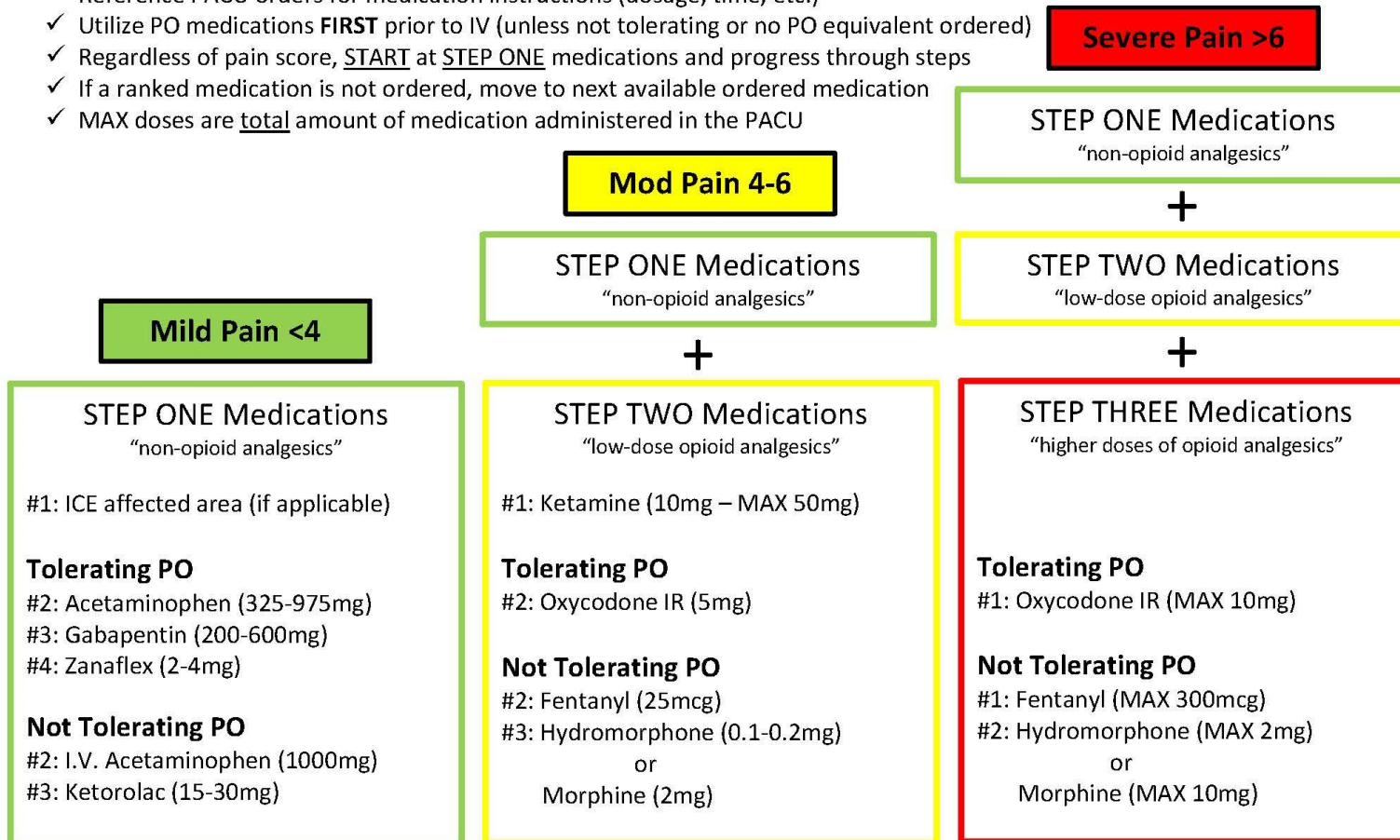
SECTION A: STUDENT POC INFORMATION	
1. Name (Last, First, MI): Bautista, Joy Marie, A.	Student E-mail: joy-marie.bautista@usuhs.edu
2. Home Address: _____	Cell Number: _____
SECTION B: COMMITTEE CHAIR / SENIOR MENTOR INFORMATION	
3. Name (Last, First, MI): Tozer, Kimberly	
4. Telephone: 262-308-2627 Fax: _____	E-mail: kimberly.tozer@usuhs.edu
5. USUHS Building/ Room No.: _____	
SECTION C: PROJECT INFORMATION	
6. Attach the Abstract for the proposal, including the following sections: Site Location of the Project, Title, Authors, Background or Problem/Issue, Clinical Question/Purpose, Project Design, Anticipated Organizational Impact/Implications for Practice and also include the Proposed Timeline. Single space the abstract and use Times New Roman font, size 12.	
7. Is this proposal related to an active research project of the Chair/Senior Mentor identified in Section B? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, complete below; if no, proceed to Part 8. Project Number: _____ Project Title: _____ Project Start Date: _____ Project End Date: _____	
8. Anticipated period of performance: Project Start Date: 2/1/2019 Project End Date: 4/30/2020	
9. Performance Site(s): Naval Medical Center San Diego (NMCSD)	
10. Does this project involve any classified information? (Contact the USUHS Security Office for guidance) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
11. Do you have a funding source for this project? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA If yes, specify the funding agency and the amount provided: _____	
SECTION D: SIGNATURES	
The following signatures attest to the validity of the above information:	
BAUTISTA JOY.M. _____ Student (Project Point of Contact for the Group) (Signature and Date)	TOZER.KIMBERLY.ANN. _____ Chair/Senior Mentor (Signature and Date)
BONDS.RAYMOND.L. _____ Chair/Program Director (Signature and Date)	SEIBERT.DIANE.C. _____ Associate Dean for Academic Affairs, GSN (Signature and Date)
WANZER.LINDA.JEANNE. _____ DNP Project Director or PhD Director (Signature and Date)	ROMANO.CAROL.A. _____ 294 Dean, DKJ Graduate School of Nursing (Signature and Date)
WASSERMAN.JOAN.E. _____ 66 Associate Dean for Research, GSN (Signature and Date)	
In light of the above signatures, the project is approved. _____ USUHS Vice President for Research Date: <u>2 July 2019</u>	



Department of Anesthesiology

Adult PACU Pain Control Guideline

- ✓ GOAL is to REDUCE overall opioid administration
- ✓ **ALWAYS** verify with anesthesia provider and MAR for previously administered medications
- ✓ Reference PACU orders for medication instructions (dosage, time, etc.)
- ✓ Utilize PO medications **FIRST** prior to IV (unless not tolerating or no PO equivalent ordered)
- ✓ Regardless of pain score, START at STEP ONE medications and progress through steps
- ✓ If a ranked medication is not ordered, move to next available ordered medication
- ✓ MAX doses are total amount of medication administered in the PACU



Anes Adult PACU Orders

Adult Orders	Comment	Order Time	Start Time		
Admit to PACU	Initiate PACU ONLY standards for care and vital signs				
I.V. Fluids	Volume (ml)	Rate (ml/hr)	Comment		
NS0.9	1000	100	PACU ONLY		
Lactated Ringer	1000	100	PACU ONLY		
LABS	Freq	Comment			
HCT	STAT	PACU ONLY: Call anesthesia provider with results			
EG7+ ISTAT	STAT	PACU ONLY: VBG please draw from venous sample			
EG7+ ISTAT	STAT	PACU ONLY: ABG please draw from arterial sample			
TREATMENTS	PRN	PACK	TOPICAL	PACU ONLY: Mild Pain Rank #1: Place ice pack to affected area (if applicable)	
ICE PACK					
MEDICATIONS					
NAME	FREQ	DOSE	ROUTE	COMMENT	
ANTIEMETIC: ONDANSETRON (ZOFRAN) (2MG/ML 2ML VIAL)	Q6H PRN	4 MG	IV	PACU ONLY: Rank #1 Nausea/Vomiting	
ANTIEMETIC: DEXAMETHASONE (DECADRON) (4MG/ML 1ml VIAL)	X1 PRN	4 MG	IVPB	PACU ONLY: Rank #3 Nausea/Vomiting	
ANTIEMETIC: PROMETHAZINE (PHENERGAN) (25MG AMP)	Q6H PRN	6.25-12.5 MG	IV	PACU ONLY: Rank #3 Nausea/Vomiting (may be given first if moderate to severe nausea and/or active vomiting)	
MILD: ACETAMINOPHEN (TYLENOL) (325MG TAB)	PRN	650 MG	PO	PACU ONLY: PO Mild Pain Rank #2 (VAS 1-4); Can administer for fever	
MILD: ACETAMINOPHEN (TYLENOL) (325MG TAB)	PRN	975 MG	PO	PACU ONLY: PO Mild Pain Rank #2 (VAS 1-4); Can administer for fever	
MILD: GABAPENTIN (NEURONTIN) (300MG CAP)	X1 PRN	300 MG	PO	PACU ONLY: PO Mild Pain Rank #3 (VAS 1-4)	
MILD: GABAPENTIN (NEURONTIN) (600MG TAB)	X1 PRN	600 MG	PO	PACU ONLY: PO Mild Pain Rank #3 (VAS 1-4)	
MILD: TIZANIDINE (ZANAFLEX) (2MG TAB)	X1 PRN	2 MG	PO	PACU ONLY: PO Mild Pain Rank #4 (VAS 1-4); Take with juice and crackers	
MILD: TIZANIDINE (ZANAFLEX) (4MG TAB)	X1 PRN	4 MG	PO	PACU ONLY: PO Mild Pain Rank #4 (VAS 1-4); Take with juice and crackers	
MILD: ACETAMINOPHEN (OPRIMEV) (AQUILT) (1000MG/100ML IV VIAL)	PRN	1000 MG	IVPB	PACU ONLY: IV Mild Pain Rank #2 (VAS 1-4); Can administer for fever	
MILD: KETOROLAC (TORADOL) (30MG/3ML SYRN)	X1 PRN	15 MG	IV	PACU ONLY: IV Mild Pain Rank #3 (VAS 1-4); [CAUTION IN RENAL DISEASE]	
MILD: KETOROLAC (TORADOL) (30MG/3ML SYRN)	X1 PRN	30 MG	IV	PACU ONLY: IV Mild Pain Rank #3 (VAS 1-4); [CAUTION IN RENAL DISEASE]	
MDD: KETAMINE (KETALAR) (100MG/ML VIAL)	SEE COMMENTS	10-20 MG	IV	PACU ONLY: IV Moderate Pain Rank #1 (VAS 4-6); USE FIRST prior to opioids; Q 10 min prn (MAX 50 mg)	
MDD: oxycodone (OXY IR) (5MG TAB)	Q4H PRN	5 MG	PO	PACU ONLY: PO Moderate Pain Rank #2 (VAS 4-6); (MAX 10 mg)	
MDD: fentanyl (SUBLIMAZE) (50MCG/ML) (2ML VIAL)	PRN	25 MCG	IV	PACU ONLY: IV Moderate Pain Rank #2 (VAS 4-6); Q 5 min prn (MAX 200 mcg)	
MDD: HYDRMORPHONE (DILAUIDID) TUBEX (1MG/ML INJ)	PRN	0.1-0.2 MG	IV	PACU ONLY: IV Moderate Pain Rank #2 (VAS 4-6); Q 10 min prn (MAX 2 mg) provided respirations >= 12/min *Do NOT administer within 10 min of Fentanyl*	
MDD: morphine (TUBEX) (4MG/ML SYRN)	PRN	2 MG	IV	PACU ONLY: IV Moderate Pain Rank #3 (VAS 4-6); Q 10 min prn (MAX 10 mg) provided respirations >= 12/min *Do NOT administer within 10 min of Fentanyl*	
SEV: oxycodone (OXY IR) (5MG TAB)	Q4H PRN	10 MG	PO	PACU ONLY: PO Severe Pain Rank #1 (VAS 6-10); (MAX 10 mg)	
SEV: fentanyl (SUBLIMAZE) (50MCG/ML) (2ML VIAL)	PRN	50 MCG	IV	PACU ONLY: IV Severe Pain Rank #1 (VAS 6-10); Q 5 min prn (MAX 300 mcg)	
SEV: HYDRMORPHONE (DILAUIDID) TUBEX (1MG/ML INJ)	PRN	0.25-0.5 MG	IV	PACU ONLY: IV Severe Pain Rank #2 (VAS 6-10); Q 10 min prn (MAX 2 mg) provided respirations >= 12/min *Do NOT administer within 10 min of Fentanyl*	
SEV: morphine (TUBEX) (4MG/ML SYRN)	PRN	2-4 MG	IV	PACU ONLY: IV Severe Pain Rank #2 (VAS 6-10); Q 10 min prn (MAX 10 mg) provided respirations >= 12/min *Do NOT administer within 10 min of Fentanyl*	
OTHER: MEPERIDINE (DEMEROL) TUBEX (50MG/ML INJ)	X1 PRN	12.5-25 MG	IV	PACU ONLY: For shivering	
OTHER: NALBUPHINE (NUBAIN) (10MG/ML 1 AMP)	Q4H PRN	2.5-5 MG	IV	PACU ONLY: For pruritus	
OTHER: MIDAZOLAM (VERSED) (1MG/ML 5ML VIAL)	PRN	0.25-1 MG	IV	PACU ONLY: For anxiety Q5 min up to (MAX 2 mg)	
OTHER: DIAZEPAM (VALIUM) (5MG TAB)	X1 PRN	5-10 MG	PO	PACU ONLY: For anxiety or muscle spasm (MAX 10 mg)	
OTHER: METHOCARBAMOL (ROBAXIN) (500 MG TAB)	X1 PRN	750 MG	PO	PACU ONLY: For muscle spasm	
OTHER: tramadol HCL (ULTRAM) (50MG TAB)	Q4H PRN	50-100 MG	PO	PACU ONLY: PO Moderate Pain Rank #2 (VAS 4-6); (MAX 300mg/dose or 400mg/day)	
OTHER: HYDRMORPHONE (DILAUIDID) U. D. (2 MG TAB)	Q3H PRN	2 MG	PO	PACU ONLY: PO Moderate Pain Rank #3 (VAS 4-6); (MAX 4 mg) (1 mg Dilaudid PO = approx. 3 mg Morphine PO)	
OTHER: morphine IMMEDIATE REL (15MG TAB)	Q4H PRN	15-30 MG	PO	PACU ONLY: PO Moderate Pain Rank #3 (VAS 4-6); IMMEDIATE RELEASE (MAX 30 mg)	
OTHER: LABETALOL (5MG/ML INJ)	PRN	5-10 MG	IV	PACU ONLY: For SBP >180, DBP >100, hold for HR <50 - Q 5 min prn (MAX 30 mg)	
OTHER: hydralazine (APRESOLINE) (20MG/ML INJ)	PRN	5 MG	IV	PACU ONLY: For SBP >180, DBP >100, hold for HR >100 - Q 5 min prn (MAX 15 mg)	
OTHER: METOPROLOL (LOPRESSOR) (1MG/ML INJ)	PRN	1-2 MG	IV	PACU ONLY: Administer with anesthesia provider at bedside	
OTHER: INSULIN REGULAR (Novolin R INJ)	x1	0 UNIT	IV	PACU ONLY: Call anesthesia provider with BG results 30 minutes after administration	
WED INSTRUCTIONS	COMMENTS				
Analgesics are ranked in order of administration	PACU ONLY: Refer to PACU Pain Control Guideline (Utilize PO medications FIRST prior to IV - unless not tolerating or no PO equivalent ordered)				
Antiemetics are ranked in order of administration - if no ranking listed:	PACU ONLY: Administer in this order - Zofran, Decadron, Phenergan				
If all antiemetics fail call floorwalker	PACU ONLY				
May initiate post-op orders for pain meds prior to discharge	PACU ONLY				
Other Diagnostic	NAME	FREQ	ORDER TIME	START TIME	COMMENT
EKG		STAT			PACU ONLY: 12 LEAD EKG
Point Of Care Testing (POC)	NAME	FREQ	ORDER TIME	START TIME	COMMENT
ACCUCHECK		see comments			PACU ONLY: Check BG 30 min after insulin dose and call anesthesia provider with result;
ACCUCHECK		STAT			PACU ONLY: Call anesthesia provider with result
Radiology	NAME	FREQ	ORDER TIME	START TIME	COMMENT
CHEST PORTABLE (STANDARD)		STAT			PACU ONLY
RT	NAME	FREQ	ORDER TIME	START TIME	COMMENT
ALBUTEROL (2.5MG/3ML SOLN)		X1 PRN			PACU ONLY: For wheezing or dyspnea
SPECIAL INSTRUCTIONS	NAME	FREQ	ORDER TIME	START TIME	COMMENT
Saline Lock IV					All PACU standard discharge criteria met and anesthesia post eval completed
Discharge patient when aldrete score 9 and:					PACU ONLY
Temp <35 Degrees C, initiate warming procedures and check Q 15 min					PACU ONLY
Discharge to floor with 2-3 L O2 by NC if SaO2 <95% on RA					PACU ONLY

Appendix E: NMCS D Quality Improvement Proposal**NMCS D Quality Improvement & Process Improvement Proposal****For CID Use Only****QI Number:**

NMCS D.QI.2018.0015

**INTENT TO ENGAGE IN PERFORMANCE IMPROVEMENT
PROJECT INVOLVING LIVING HUMAN BEINGS OR
IDENTIFIABLE PATIENT INFORMATION**

Complete and submit this form to [Maria Devore](#) when an investigator proposes a performance improvement project involving humans that s/he does not believe constitutes human subject research. The investigator must provide adequate information for the IRB Chair/ Vice Chair and/or delegate to determine whether the project constitutes human subject research. If the reviewer determines that a project is not human subjects research, the IRB will have no on-going involvement with the project. If the project is deemed to meet the definition of human subject research, a complete IRB submission will be required.

A data sharing agreement checklist must also be included in this submission. Contact the Clinical Investigation Department or Maria Devore for the most recent version.

Be as specific as possible when answering the below questions.

Investigator Name (LAST, FIRST):	Rank, Designation and/or Degree:
<input type="text" value="OCHS, RYAN"/>	<input type="text" value="LT"/>
E-mail:	Phone Number:
<input type="text" value="ryan.t.ochs.mil@mail.mil"/>	<input type="text" value="619-323-6256"/>
Command:	Department:
<input type="text" value="NMCS D"/>	<input type="text" value="Anesthesiology"/>
Project Title:	
<input type="text" value="Reducing Intraoperative/Postoperative Narcotic Utilization"/>	

1. Describe the problem that this project will identify and improve. Specifically mention the population/program and provide the background, evaluation, and method of implementation.

The prescription and use of opioid medications for peri- and post-operative noncancer pain has continued to increase, which has led to the opioid epidemic seen today. Surgical patients are often preemptively prescribed a standard dose of narcotics in anticipation of postoperative pain rather than based on the individual case. Overprescription of narcotics and retained surplus medication presents a readily available source of opioid diversion among this population. The enhanced recovery after surgery pathway (ERAS) has been shown in emerging studies to improve the value and quality of surgical care for a variety of specific surgical procedures by utilizing opioid-sparing analgesic regimens.

This project intends to extend the ERAS principles to all surgical patients before, during, and after surgery, leading to decreased opioid use and improved quality of patient care. The first phase will involve collection of baseline data from intraoperative, PACU, and postoperative records followed by creation of a low-narcotic intraoperative pathway as a guideline for patient care during these periods. The second phase will see implementation of a low-narcotic order set to be used in the PACU and further data collection. The third phase will implement a low-narcotic floor order set to be used on the wards, as well as low-narcotic discharge instructions, with ongoing data collection. The fourth phase will be reassessment of narcotic use in our surgical patient population.

2. Do you have intentions to publish and/or present the outcome/findings of this project?

- YES
 NO

If YES, please indicate the forum in which you primarily plan to disseminate the information (e.g. local conference, international conference, peer-reviewed manuscript)

Local/National Conference, Peer-reviewed manuscript

3. Does the project include testing the safety and efficacy of a drug or device in a human subject?

- YES
 NO

If YES, please explain:

4. Do you PRIMARILY intend the information you learn from this project to be generalizable beyond your institution?

Research is defined as a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge. Activities which are designed to contribute "generalizable knowledge" would be those whose original intent is to make public via oral presentation, poster, or journal publication outside of the Command at which the activity occurs, or outside of an Educational program (PhD program, for example) for which the activity was done.

- YES
 NO

If Yes, please explain:

5. Do you PRIMARILY intend the information you learn to provide immediate and continuous improvement and feedback at your institution?

- YES
 NO

If Yes, please explain:

Inherent in this project is a continuous evaluation of successful patient treatment which may be further used to modify existing local practice guidelines in the Directorate of Surgical Services

6. Are the activities or interventions considered standard of care?

- YES
 NO

If Yes, please explain:

Opioid-sparing analgesia treatment modalities are already used both at NMCSD and beyond and are in keeping with the standard of care. Furthermore, providers will not be strictly limited by any proposed treatment guidelines and may exercise clinical judgment in the prescription of opioids as needed.

7. Are participants expected to benefit directly from these activities?

- YES
 NO

If Yes, please explain:

Patients who limit opioid use during their surgery and recovery may experience a decreased length of hospital stay and quicker return of functional status

8. Will you collect data from living individuals through some type of intervention?

- YES
 NO

If Yes, please explain:

Evaluation of the adequacy of pain control is by nature a subjective measurement that relies on direct patient feedback. While in the hospital, these assessments are done routinely as part of overall patient care. Patients will also be contacted after discharge for further input and data collection.

9. Will you interact in ANY way with a living individual?

- YES
 NO

If Yes, please explain:

Surgical patients will be evaluated pre-, intra-, and post-operatively in the form of verbal and physical examination. Interactions will take place without any diversion from standard patient care.

10. Will you have access to individually identifiable information?

- YES
 NO

If Yes, please explain:

The data involved in this project will come from patient medical records, but individually identifiable information will not be presented or published in any way. Data will be stored on our Anesthesiology shared folder which is restricted to the Department, and from there we can further password protect any documents as needed.

Data collected will be used as part of process improvement for our existing ERAS pathways and possibly as a jumping off point for opioid-sparing surgery protocols.

11. Will you be utilizing the electronic medical record in any way?

- YES
 NO

Please use this space to include any other information you would like considered in the determination of this review:

The data involved in this project will come from patient medical records, but individually identifiable information will not be presented or published in any way. Data variables to be collected are: age, gender, surgery, opioid-sparing pathway followed (y/n), general or neuraxial/regional anesthesia.

Additional variables are:

Time Until PACU Discharge Criteria Met

Total Morphine Equivalents POD#0

Average Pain Score POD#0

Total Morphine Equivalents POD#1

Average Pain Score POD#1

Total Morphine Equivalents POD#2

Project Lead and Department Head

The information provided clearly states the intention and plan for this project. All responsibilities and resources needed in conducting this project lies with the project lead and their respective department.

Project Lead

Signature and Date:

Department Head

Signature and Date:

CID DETERMINATION

(CID USE ONLY)

More information is required to complete review, specifically:

This is a Performance Improvement / Quality Assurance project.

NOTES:

This is a PI/QA project-recommend approval.

This appears to be a human subject research project and warrants full submission to the IRB

NOTES:

Reviewer Signature and

Date:

Digitally signed by
GAO.HONG. [REDACTED]



DO NOT COMPLETE THIS PAGE, CID USE ONLY***Reviewer Checklist: Human Subject Research-vs.-
Quality Improvement/Process Improvement***

Each Assessed Element must meet criteria for Quality Improvement in order for this project to be conducted without IRB review and approval. This form must accompany the signed QI checklist submitted by the POC of the project.

Assessed Element	Human Subject Research	Quality Improvement	Notes
Intent	<input type="checkbox"/> Contribute to “generalizable” knowledge	<input checked="" type="checkbox"/> Improve a program or service or ensure it conforms with expected norms	
Design	<input type="checkbox"/> Develop or contribute to “generalizable” knowledge, may involve randomization of individuals to different treatment regimens or processes.	<input checked="" type="checkbox"/> Not intended to develop or contribute to “generalizable” knowledge, does not involve randomization of individuals, but may involve comparison of variations in programs	
Effect on Program or Practice Evaluated	<input type="checkbox"/> It is not the specific intent that findings of the activity will directly affect institutional or programmatic practice; however, they may influence future policies	<input checked="" type="checkbox"/> Findings of the activity are expected to directly affect institutional practice and may identify corrective action(s) needed	
Population	<input type="checkbox"/> Usually involves a subset of individuals; generally, statistical justification for sample size is used to ensure endpoints are met	<input checked="" type="checkbox"/> Includes all or most receiving a particular treatment or process; exclusion of information from some individuals significantly affects conclusions	
Benefits	<input type="checkbox"/> Participants may or may not benefit directly; benefit, if any, to individuals is incidental or delayed	<input checked="" type="checkbox"/> Participants are expected to benefit directly from the activities	
Dissemination of Results	<input type="checkbox"/> The intent to publish or present the findings is generally presumed at the outset; dissemination of information usually occurs in research/scientific publications or other research/scientific fora; results expected to develop or contribute to “generalizable” knowledge	<input checked="" type="checkbox"/> The intent to publish or present is generally NOT presumed at the outset; dissemination of information does not occur beyond the institution evaluated; dissemination of information may occur in quality improvement publications; when published or presented to a wider audience, the intent is to suggest potentially effective models, strategies, assessment tools or provide benchmarks or base rates rather than to develop or contribute to “generalizable” knowledge.	

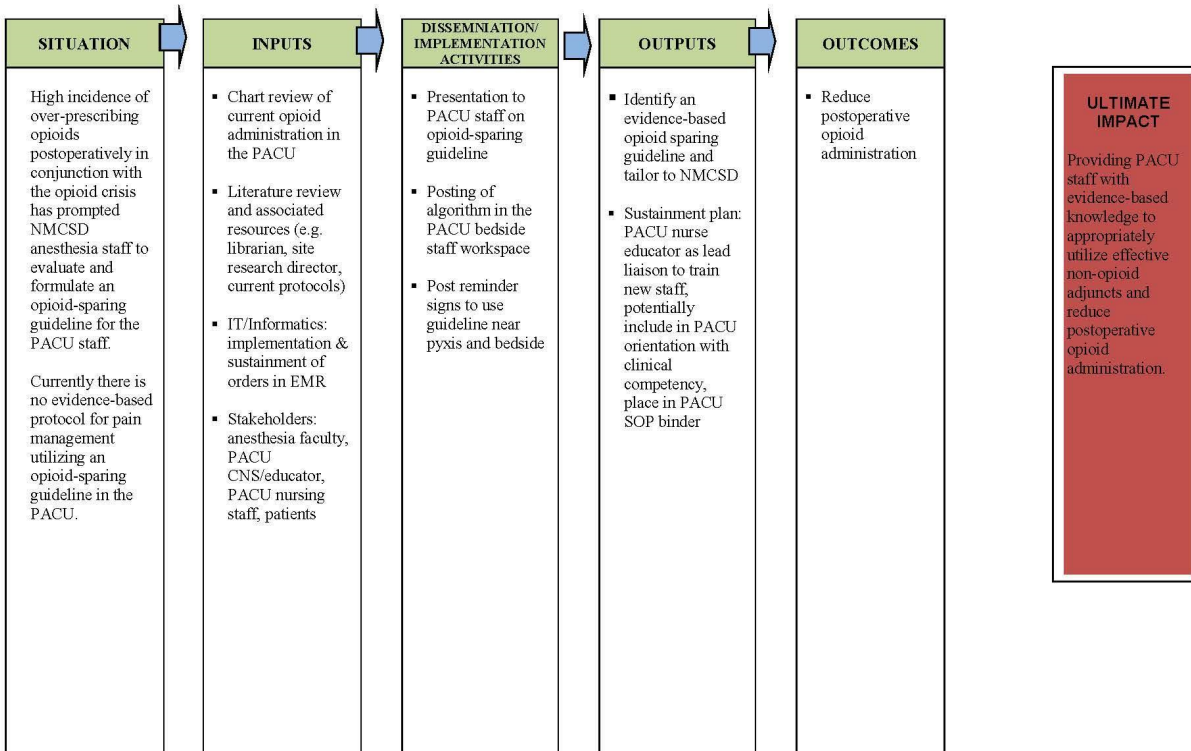
Appendix F: Data Table

Hysterectomy Patients Under GETA		
Variable	Frequency	%
Pre-implementation	49	52
Post-implementation	45	48
Total	94	100
ERAS Compliant		
Pre-implementation	34	69
Post-implementation	31	68
Ketamine in PACU		
Pre-implementation	1	2
Post-implementation	14	31.1
Non-narcotic Adjunct Given in PACU		
Pre-implementation	12	24
Post-implementation	15	33

PRE-Implementation Group (n=49)					
Variable	Frequency	Mean	SD	Min	Max
Age	49	42.33	11.37	21	72
PACU Oral MSO4 Equivalents	46	1.2	2.13	0	6.00
PACU IV MSO4 Equivalents	47	6.28	9.23	0	45
PACU Total MSO4 Equivalents	45	6.70	7.90	0	45
PACU Recovery Time (min)	49	94.02	38.56	35	188

POST-Implementation Group (n=45)					
Variable	Frequency	Mean	SD	Min	Max
Age	45	41.73	10.23	24	68
PACU Oral MSO4 Equivalents	43	2.38	2.73	0	12.5
PACU IV MSO4 Equivalents	45	10.94	11.91	0	53.3
PACU Total MSO4 Equivalents	43	12.92	13.00	0	58.3
PACU Recovery Time (min)	45	117.13	51.66	46	290

Appendix G: Logic Model



Appendix I: PAO Clearance

BUMEDINST 5721.3D

NAVY MEDICINE CLEARANCE OF AUTHORED WORKS FORM						
DATE FORM COMPLETED: 3/24/2020						
Authors	Rank/CIV/CTR	Command/ Organization	Institutional affiliation	Role in a research or work	E-Mail Address	Phone Number
Bautista, Joy M. LT		DSS 00259-ANESTHESIOLOGY-04AN00		GME Resident/Fellow		858-837- 1902
Balazs, Jason D. LT						
Moore, Jeremy A. LT						
Does this work require expedited review? <input checked="" type="radio"/> YES <input type="radio"/> NO						
If yes, please explain (*note expedited review is not guaranteed):						
Title of work:			The Implementation of a Postoperative Opioid-Sparing Guideline 06MAR Opioid Group_Final Manuscript Draft.docx			
Format: This automated work is a: Choose One			PRESENTATION ABSTRACT			
Select your parent command:						
<input type="radio"/> Research and Development Enterprise (R&D)		<input type="radio"/> NMETLC				
<input checked="" type="radio"/> Military Treatment Facility		<input type="radio"/> BUMED Headquarters		<input type="radio"/> Other		
List publication(s) or forum(s) you plan to submit to (up to 3):						
Expected date of publication: 2020-05-13			Name of conference or event: USU Research Days			
Conference or event date: 2020-05-13			Intended audience: medical professionals			

NAVMED 5721/2 (02-2017)

BUMEDINST 5721.3D

Checklist Y/N (to be completed by the first by the author then by designated reviewers)				
General	Ech 4 or 5	Ech 3	Ech 2	Additional Information
Does the authored work clearly identify the rank, Corps, and parent command of the author(s)?	YES			
Does the authored work contain sensitive subject matter as determined by BUMEDNOTE 3070 or BUMED Office of Communications Sensitive Topic list?	NO			
If yes list topic(s)				
Acknowledgement of funding included? (Reference BUMEDINST 5721.3D)	NO			
Has this work been approved before for another publication or venue?	NO			
If yes, include information on prior approval and if the work was published or presented at another venue.				
Have Navy Medicine authors completed all training required local or regional command for publishing authored works? applicable	NO			
If applicable attach documentation with submission, if not enter N/A or not applicable	NO			
Was this work created in conjunction with organizations external to Navy Medicine?	NO			
If yes, provide the organization and contact info of the individual who received approval				
If created with external organizations, have those organizations reviewed and cleared for release?	NO			
If applicable, attach documentation to this submission				
Does this authored work meet HIPPA requirements?	NO			
Are HIPPA enclosures included?	NO			
If yes, list number here:				

Was this work completed prior to working with Navy Medicine? If yes, please identify organization	NO			
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OPSEC/Security Officer Review	Ech 4 or 5	Ech 3	Ech 2	Additional Information
Does the authored work address plans, policies, programs, or operations of the DoD or the U.S. Government?	NO			
Does this authored work discuss current or future operational deployments or training exercises?	NO			
Does this authored work discuss or involve foreign or host nation military personnel, foreign citizens, or a foreign country? This includes U.S. personnel based in foreign nations	NO			
Does this authored work discuss information deemed sensitive or for official use only (FOUO)?	NO			
Has OPSEC/Security Officer reviewed/ approved?	YES			
Other	Ech 4 or 5	Ech 3	Ech 2	Additional Information
Provide source of funding for research i.e. U.S. Navy Bureau of Medicine and Surgery (BUMED), Office of Naval Research (ONR), Air Force Office of Scientific Research (AFOSR), Defense Advanced Research Projects Agency (DARPA), Army Research Laboratory (ARL) or other agency.	NO			
If applicable, please provide work unit number (only one work unit/project allowed)				
Use of animals?	NO			
If yes, include reference to approval by Institutional Review Board (IRB) with page number where it can be found (Reference BUMEDINST 5721.3D)				
Use of human subjects?	NO			
If yes, include reference to approval by Institutional Review Board (IRB) with page number where it can be found				

(Reference BUMEDINST 5721.3D)				
Is the research supported by a grant, cooperative research and development agreement (CRADA), materials transfer agreement (MTA), non-disclosure agreement (NDA), or other agreement?	NO			

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Clinical Investigations

If material is a report of clinical investigations program sponsored research, this statement must be included in your written materials:

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Indicate where this disclaimer is located:

Background:

Results:

Conclusion:

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Local Command						
Authority	Name	Phone Number	E-mail Address	Approve Y/N	Signature	Date
OPSEC Officer	ISABELL.LEE			Y		2020-03-23
Command Ethics Counselor						
Public Affairs	RAFAEL.VALDEZ			Y		2020-03-24
Regional Command						
Authority	Name	Phone Number	E-mail Address	Approve Y/N	Signature	Date
OPSEC Officer						
Command Ethics Counselor						
Public Affairs						
Command Officer or Appointed Designee						
Public affairs posture (active/passive):						
U.S. Navy Bureau of Medicine and Surgery (BUMED)						
Authority	Name	Phone Number	E-mail Address	Approve Y/N	Signature	Date

OPSEC Officer						
Command Ethics Counselor						
Public Affairs						
Command Officer or Appointed Designee						
Public affairs posture (active/passive):						

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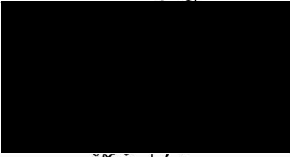
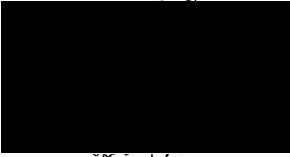
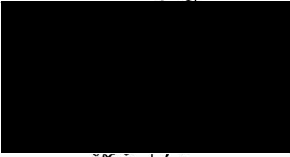
Appendix J: DNP Project Completion Verification Form



Appendix G: Daniel K. Inouye Graduate School of Nursing
DNP Project Completion Verification Form

**DOCTOR OF NURSING PRACTICE PROJECT
Completion Verification Form**

The DNP Project titled: “*The Implementation of a Postoperative Opioid-Sparing Guideline*” was completed at Naval Medical Center San Diego by the following student(s):

<i>(type student name)</i>	<i>(signature)</i>	<i>(date)</i>
LT Jason Balazs _____		03-27-2020 _____
LT Joy Marie Bautista _____		03-27-2020 _____
LT Jeremy Moore _____		03-27-2020 _____

The DNP Practice Project Team verifies that the following components of the DNP project, accomplished by the above students, is of sufficient rigor and demonstrates doctoral level scholarship to meet the requirements for USUHS GSN graduation:

- Presentation of DNP project to the leadership/stakeholders at the Phase II Site,
- Abstract/Impact Statement (*Appendix F*), and
- DNP Project written report.

Verified by:

<i>(type name)</i>	<i>(signature)</i>	<i>(date)</i>	
LCDR Danielle Cuevas _____		03/27/2020 _____	Senior Mentor
CDR Eric Bopp _____		03/27/2020 _____	Team Mentor
CDR Tiffany Uranga _____		3/27/2020 _____	Team Mentor & Phase II Site Director

For RNA Students only - add the following additional signature for final verification of project completion:

CDR Ken Radford, PhD, CRNA _____		2 APR 2020 _____
RNA Project Director <i>(type name)</i>	<i>(Signature)</i>	<i>(Date)</i>