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Postoperative Nausea and Vomiting Prevention: Screening and Interventions

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and

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[redacted]

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Abstract

Phase II Site: Naval Hospital Jacksonville

DNP Project Title: Postoperative Nausea and Vomiting Prevention: Screening and Interventions

Author: Bledsoe, Rusty H.

Background: The risk for postoperative nausea and vomiting (PONV), up to 80%, can be identified in the preoperative anesthetic evaluation. PONV increases facility cost through staffing, recovery room time, as well as possible admission to the hospital. Customer satisfaction is drastically affected by the occurrence of PONV. Currently, at Naval Hospital Jacksonville, there is not a standardized PONV risk assessment tool or treatment guidelines. With the utilization of the Apfel Simplified Score and suggested evidence-based prophylaxis guidelines, a patient's PONV risk can be dramatically reduced.

Purpose: To standardize PONV risk assessment and recommended prophylactic interventions.

Project Design: The project was designed to collect data on PONV rates before and after implementation of the Apfel score and suggested evidenced based prophylaxis guidelines. Anesthesia providers and Postanesthesia Care Unit (PACU) nurses were educated on the importance and use of the Apfel score and corresponding prophylaxis guidelines. A knowledge exam was administered to anesthesia providers and PACU staff pre and post education.

Results: This project created standardized guidelines for PONV risk assessment and prophylaxis.

Organizational Impact/Implications for Practice: The standardization and utilization of the Apfel score and suggested prophylaxis guidelines to decrease PONV rates while improving patient comfort and satisfaction. This can lead to cost savings and increase medical readiness for the medical treatment facility.

Introduction

Postoperative nausea and vomiting (PONV) is a preventable and common source of postoperative morbidity, estimated to occur in 30-80% of patients (Gan, 2006). This wide variation in incidence can be partly attributed to differences in identifiable risk factors across patient populations. Identifiable risk factors may be attributes of either the patient or the surgical procedure. The Apfel Simplified Score combines these risk factors to predict the probability that a given patient will experience PONV and has been used in research studies to identify patients at higher risk of PONV and to calculate risk-adjusted outcomes for PONV prophylaxis or treatment (Sigaut et al., 2010). The Apfel score has four risk factors that increase a patient's risk of PONV by 20% for each identified risk factor, and all patients have a baseline risk of 10% (Gan et al., 2014). The four risk factors are 1. Female gender, 2. Non-smoker, 3. Postoperative opioid use, and 4. History of PONV or motion sickness (Gan et al., 2014). For example, a female who receives opioids after surgery, does not smoke, and has a history of motion sickness or PONV has a calculated risk for PONV of 80%. Each suggested antiemetic intervention is expected to decrease PONV risk by up to 26% (Apfel et al., 2004).

Naval Hospital Jacksonville was not utilizing a standardized PONV risk assessment tool or prophylactic guidelines. This led to a literature review being conducted in search of an evidence-based PONV risk assessment tool. The Apfel score, combined with targeted prophylaxis, has been shown to decrease the incidence of PONV for high-risk patients during Phase I of PACU to16.6% (Kolanek et al., 2014).

Significance of the Problem

One survey found patients were prepared to pay up to $100 of their own money to avoid experiencing PONV (Gan et al., 2001). Although any patient can develop PONV, females,

nonsmokers, and those who have a history of PONV or motion sickness are at the highest risk. There are also anesthesia-related factors that can increase the incidence which includes the use of volatile anesthetics, using nitrous oxide, and opioid use during the perioperative period (Keyes, 2013). Patients who experience PONV require additional personnel, supplies, and medications. They also experience delayed discharge and draw staff away from caring for other patients. Surgical facilities can utilize the Apfel score to identify patients at high risk for PONV before surgery to reduce potentially lost revenue.

Clinical Question

In surgical patients, will utilizing the Apfel score with evidence-based PONV prophylactic guideline, compared to no guideline decrease the incidence of PONV?

Focus Areas

This project is comprised of two focus areas. First, PONV rates will be assessed in the PACU before and after implementation of the Apfel score. The second is provider utilization of the Apfel score and adherence to prophylactic intervention recommendations.

Project Short- and Long-Term Goals

The short-term goal of this project was to decrease the PONV rates in phase I of the PACU at Naval Hospital Jacksonville. The long-term goal of this project was to provide an example of how to utilize the Apfel score and suggested evidence-based guideline to decrease PONV rate so that this project can be applied throughout the Military Health System.

Military Relevance

The Apfel score can be used to help achieve Navy medicine's vision of being the leaders of readiness and healthcare throughout the world (Navy Medicine, 2011). PONV can lead to an extended patient stay in the PACU and possible admission to the hospital, which will increase

costs and possibly cause patients to have a worse experience (Ganter et al., 2014). Accurate assessment of a patient's risk for PONV and potential benefits from multimodal prophylaxis proved to be a cost-effective approach to managing PONV (Gutierrez-Williams & Goldman, 2008).

Unnecessary administration of antiemetics, such as ondansetron, can increase cost. One study showed that proper identification of risk for PONV reduced the amount of ondansetron by 38% and saved the facility $75,000 annually (Gutierrez-Williams & Goldman, 2008). The ability to identify patients at high risk for PONV and provide targeted treatments to those who would most benefit has the potential to help the Military Health System meet its goal of decreasing per-capita cost of care.

The utilization of the Apfel simplified score can improve mission readiness by reducing an active duty member's length of stay in the hospital and prevent severe complications such as dehiscence of the surgical site or aspiration due to PONV. By implementing the Apfel simplified score into the EMR, the military could reduce budgetary constraints of the medical treatment facility. The utilization of the Apfel simplified score addresses the issue of PONV, which meets the goals of the quadruple aim by improving the patient's experience of care, improving the patient's overall health, reducing health care cost, and improving mission readiness (Devpost, 2017).

Nursing Relevance

Professional nursing is concerned with the protection and promotion of health, injury prevention, and the alleviation of suffering (ANA, 2010). A portion of surgical patients will experience clinically significant PONV, which can leave them unable to participate in activities

of daily living and lead to a poorer quality of recovery, increased rate of complications, and a decline in patient satisfaction. (Smith & Ruth-Sahd, 2016). Patients who suffer from PONV also experience an increased length of stay in the PACU of an additional 60-180 minutes (Smith & Ruth-Sahd, 2016). Appropriate prophylaxis for PONV helps nurses achieve better health and less suffering for their patients.

Organizing Framework

The organizational framework for this project was the Stetler Model of Evidence-Based Practice (Figure 1) (Stetler, 2001). The Stetler Model was adapted to be specific to this project (Figure 2). Phase I of the Stetler Model consists of the identification of a problem and possible outcomes (Stetler, 2001). Observed increased incidence of PONV by PACU staff served as the catalyst for change. Phase II of this model consists of the literature review, as well as the synthesis and evaluation of the findings (Stetler, 2001). In phase III, the decision of which evidence to use to influence change is made (Stetler, 2001). Phase IV consists of gathering baseline PONV rates before implementation of the Apfel score and increasing the awareness of PONV among staff (Stetler, 2001). After collection of baseline data, the preoperative Apfel score and guidance for evidence-based prophylaxis for PONV was implemented through staff education and placement into the preoperative anesthesia evaluation. In Phase V, post-implementation PONV rates were collected. Finally, the data were analyzed to determine results and what future steps were needed, all of which were shared with stakeholders.

Project Design

General Approach

PubMed and Cumulative Index of Nursing and Allied Health Literature (CINAHL) databases were utilized to find articles that contain the use of the Apfel score or a computerized decision support tool in the electronic medical record (EMR). The following phrases were used as search terms in both databases "Apfel score", "postoperative nausea and vomiting", "electronic medical record", "computerized decision support tool", "electronic clinical support tool", "provider compliance", "provider adherence", and "guideline adherence". Database searches were limited to a year range of 2006 to 2016, English language, and the adult population. As of June 27, 2017, database inquiries of PubMed and CINHAL retrieved 41 articles.

Duplicates were removed, and the remaining 38 articles were screened for exclusion criteria: non-surgical, not related to PONV, no relevance to the Apfel score or an electronic decision support tool. Twenty-four articles were excluded via title and abstract. After reading the remaining 14 articles in their entirety, seven articles met exclusion criteria. A PRIMSA Flow Chart (Figure 3) was created to aid with visualization of article screening.

Each article was appraised for the level of evidence using the Evidence Pyramid, as described by Melnyk & Fineout-Overholt (2011). One article is a Level I systematic review and the remaining six articles are Level IV retrospective cohort, prospective observational, or prospective cohort studies.

The Johns Hopkins Nursing Evidence-Based Practice Appendix E: Research Evidence Appraisal Tool was used to evaluate the quality of the nine articles (Johns Hopkins University, 2016). Six articles are of high quality, and the remaining article is good quality. Even though every article found did not include the Apfel score specifically, all of them pertain to the PICOT question. The articles were reviewed, and an evidence appraisal table was created (Table 1). All

the articles concluded that the utilization of an electronic decision support tool with or without electronic reminders decrease the incidence of PONV, increase PONV prophylaxis, or both.

Setting

This project was conducted at a military treatment facility in Jacksonville, Florida. The hospital has six main operating rooms (ORs), two labor and delivery ORs, and two endoscopy rooms. The anesthesia providers consist of both military and civilian CRNAs (n=8), anesthesiologists (n=5), and student registered nurse anesthetists (n=2). The PACU staff consisted of registered nurses (n= 13) and corpsman (n=5). The patient population is made up of active duty military, retirees, and their family members.

Procedural Steps

Initial data collection from patient charts consisted of PONV rates before the introduction of the Apfel score and evidence-based PONV prophylaxis to the staff. Data were collected from 69 consecutive patient charts undergoing outpatient surgery: 23 general surgeries, 23 gynecological surgeries and 23 orthopedic surgeries. The following inclusion criteria were used: ages 18-89, non-emergent case, use of general anesthesia, ASA < 4, and nausea not present at the time of preoperative anesthesia interview. The following surgical specialties were excluded: obstetrics, urology, pediatrics, and ear, nose, and throat.

An Apfel score flowsheet, including suggested interventions, was created and implemented into the electronic medical record (Figure 4). An educational slide presentation was developed explaining the pathophysiology of PONV, the mechanism of action of proposed interventions, as well as the importance and utilization of the Apfel score flowsheet. Another educational slide presentation was created for the PACU staff explaining the pathophysiology of PONV, how to tell the difference between secretions and emesis, an emphasis was placed on the

PACU staff asking about nausea the same way "Are you nauseous?" and explaining the importance and utilization of the Apfel score. Next, the flowsheet was implemented in the electronic preanesthesia evaluation. Plastic cards were printed with antiemesis prophylaxis suggestions on the front (Table 2) and how each antiemetic medication that is given affects a patient's PONV risk on the back (Table 3). The cards were placed at every preoperative computer and on every anesthesia machine to serve as reminders for the anesthesia providers.

HIPAA Concerns (IRB)

Per the institutional review board, this project was exempt because no data was collected that contains patient identifiers or protected health information. A chart review was performed to collect the following items: Apfel score, ASA status, pregnancy status, type of general anesthesia performed, antiemetic intervention used, presence of nausea in preoperative area, PONV in recovery room, and length of stay in the recovery room.

Results

The final data collection consisted of PONV rates after project implementation from patient charts (n=69) of 23 general surgery patients, 23 gynecological patients, and 23 orthopedic patients. The pre-interventions PONV rate was 17.4%, and the post-training rate was 30.4%.

Analysis of the Results

Further analysis of the collected data was performed to try and determine the causation of the increase in PONV rates. The pre- and post-project populations were compared using a chi-square test (Table 4). The only statistically significant difference was in the expected use of postoperative opioids. The difference is due to all expected use of postoperative opioids were scored as "no" in the pre-project data collection. In the pre-intervention phase, the anesthesia

providers followed the suggested guidelines 56.5% of the time as compared to 62.3% of the time post-intervention. In both the pre-intervention and post-training time frames, most patients had an Apfel score of two.

The anesthesia providers' estimation of patients' Apfel score was compared to the actual observed Apfel score (Table 5). The rationale for the difference in patients' Apfel scores was due to unpredicted use of opioids in PACU phase I. In the pre-implementation phase, anesthesia providers expected 36% of patients to receive opioids while 62% of patients received opioids. In the post-training phase, anesthesia providers expected 33% of patients to receive opioids while 59% of patients received opioids. While the anesthesia providers did get better at predicting post-operative opioid use, further training on predicting post-operative opioid use is indicated.

Another possible causation of the increase in PONV was a nationwide shortage of ondansetron. Dexamethasone and ondansetron were the primary antiemetic interventions used both pre and post-implementation. Out of the 35 patients that received ondansetron, only one administration occurred in the post-training phase. The primary population where PONV occurred was in Apfel 2 patients. The suggested antiemetic interventions for Apfel 2 patients was one or two. In the pre-training phase, the majority of Apfel 2 patients received two antiemetics, but in the post-training phase, the majority of Apfel 2 patients received one antiemetic, which primarily was dexamethasone.

Organizational Impact / Implications to Practice & Policy

This project sought to standardize the risk assessment for PONV and provide clinical guidelines for evidence-based prophylaxis at Naval Hospital Jacksonville. Navy hospitals operate under a larger organization known as the Military Health System. Ideally, this project would serve as a template for replication at other Military Treatment Facilities seeking to reduce

the incidence of PONV, improve the experience of patients undergoing outpatient surgery, and contain per-capita cost.

Future Directions for Research and Practice

Future research is needed to further evaluate the efficacy of the Apfel score as preoperative PONV risk assessment tool. Anesthesia provider knowledge should be reassessed periodically to determine consistency in training. Periodic reassessments of provider adherence to the recommended evidence-based guidelines and PONV rates are needed to gauge the long-term impact of this project.

Conclusion

While this project did not decrease the PONV rate, it did identify further training is needed to help anesthesia providers correctly estimate the use of postoperative opioids and highlighted the importance of multimodal PONV prophylaxis. Future recommendations would be to administer two antiemetic interventions for Apfel 2 patients.

The main limitation of this evidence-based practice project was a nationwide shortage of ondansetron during the post-implementation phase. Another limitation was the dependency on the PACU staff. Even though the PACU staff was taught how to ask about nausea, variation was reportedly witnessed by the anesthesia providers. The sample population was limited to military personnel, family members, and retirees due to the hospital being a military treatment facility. A larger civilian hospital would be advantageous for capturing a more diverse patient population. Military treatment facilities have a high turn over of personnel which could have impacted the results of this project due to lack of experience with this project.

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Figures

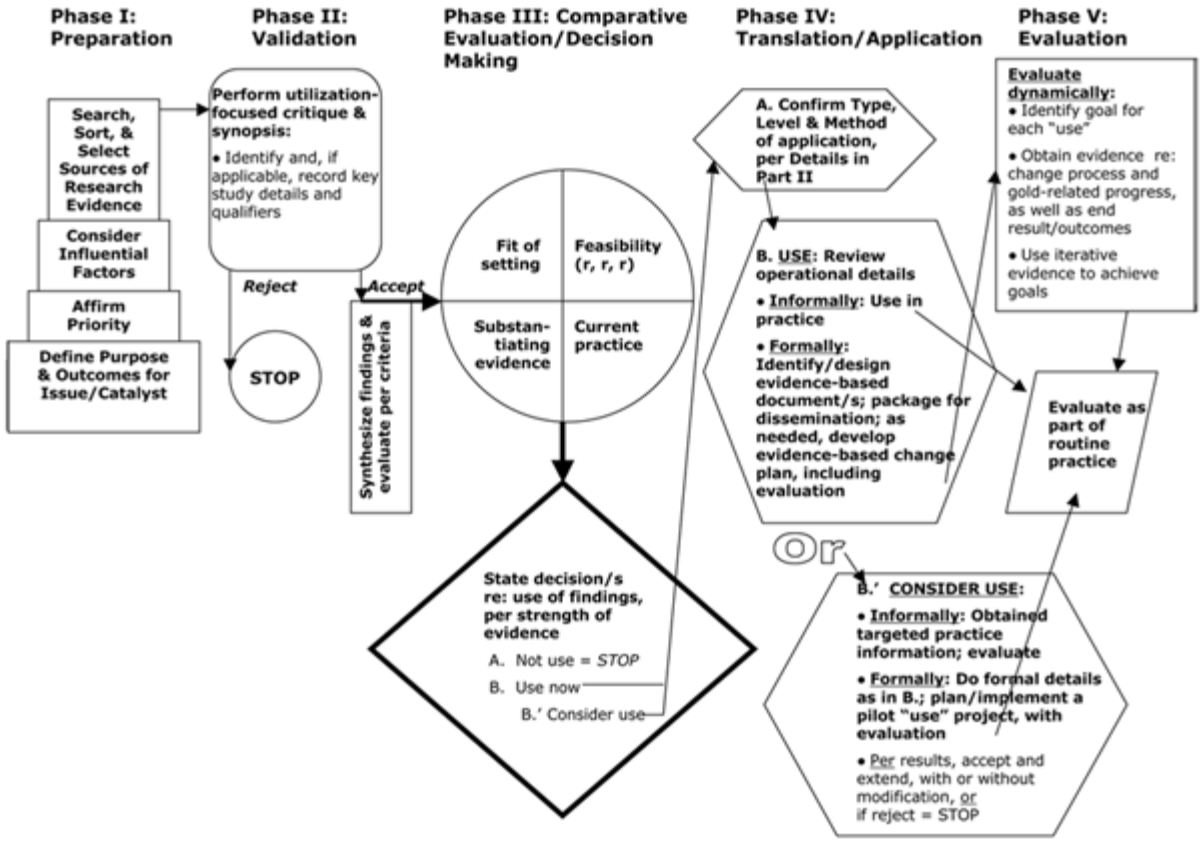

Figure 1: Stetler Model of Evidence-Based Practice

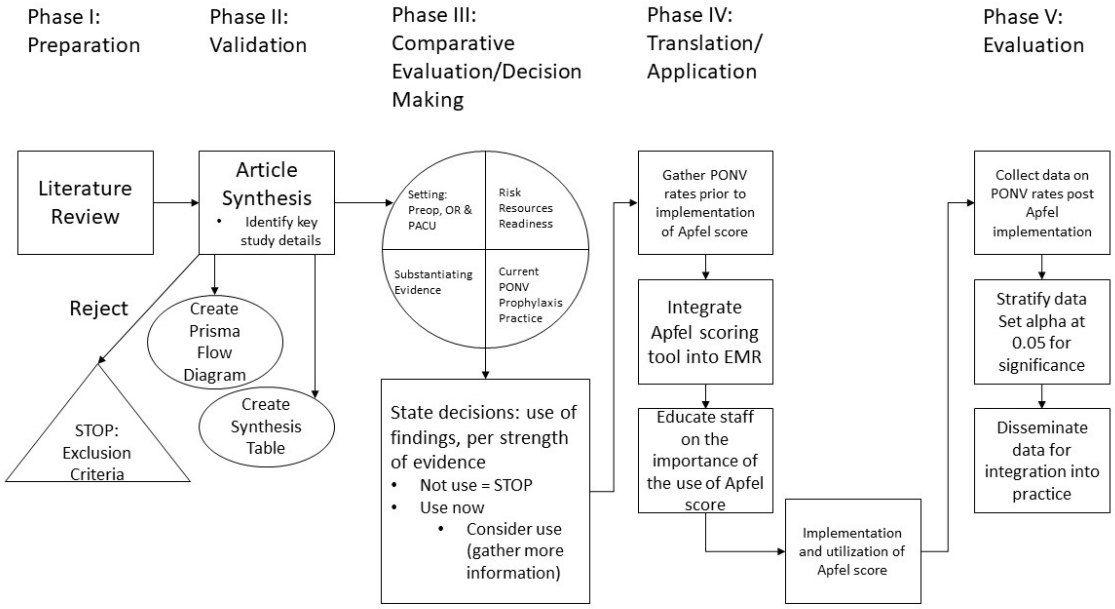

Figure 2: Adapted Stetler Model of Evidence-Based Practice

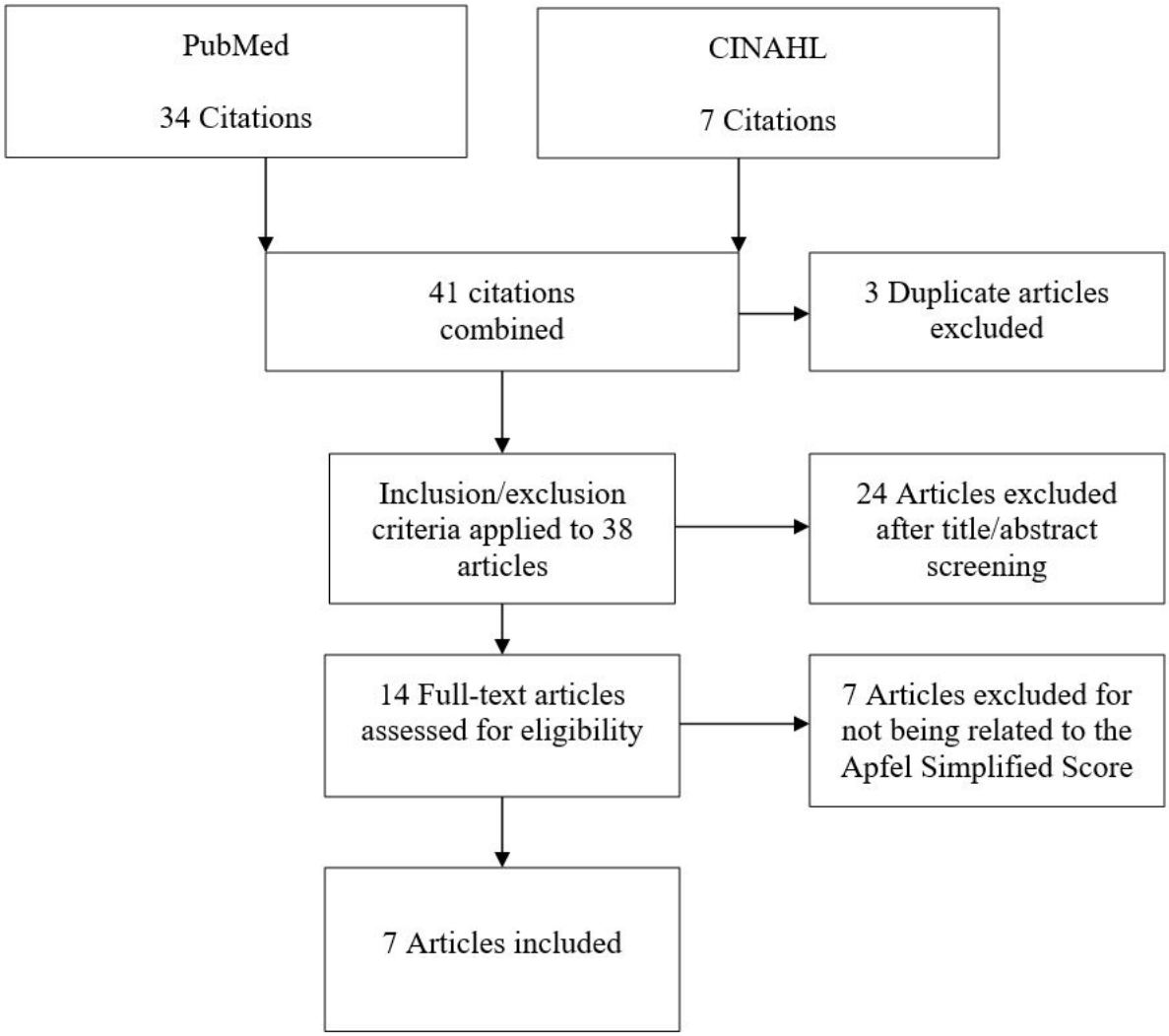

Figure 3: PONV Articles PRISMA Flow Chart

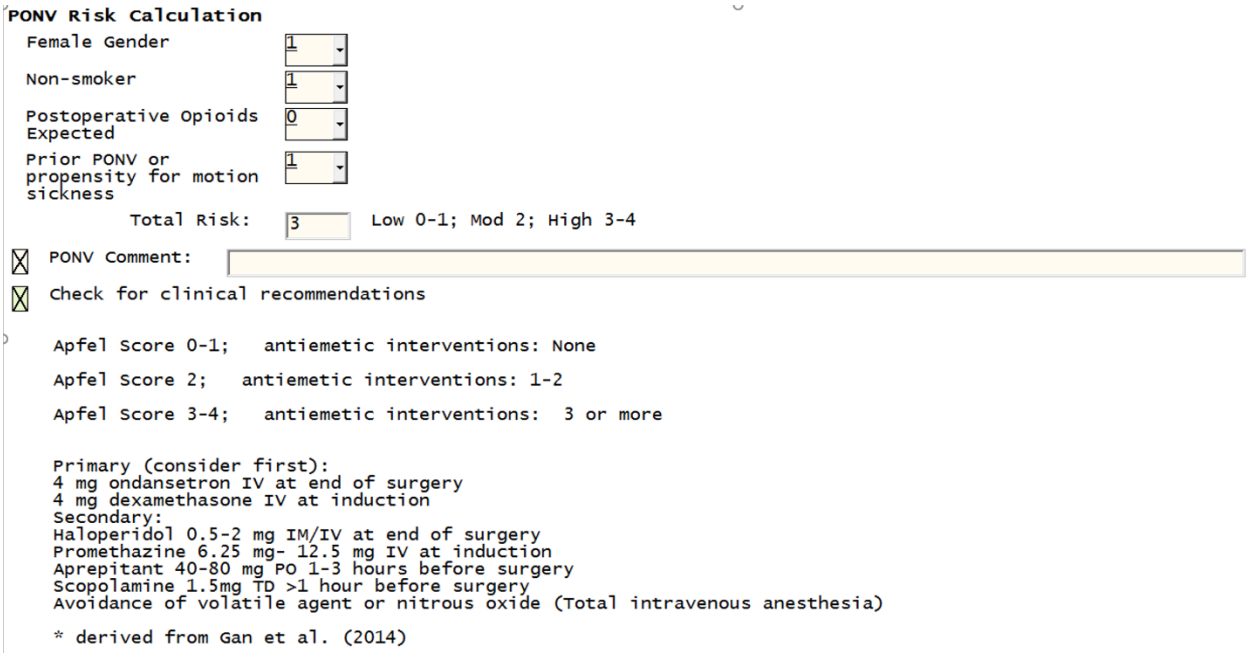

Figure 3: Electronic medical record Apfel note

Tables

Citation	Purpose	Sample	Design	Intervention	Outcomes	Results	Evidence Level: Quality
Gan, 2014[9]	Provide an evidence-based algorithm for prophylaxis and treatment of PONV	Review of 335 articles	Systematic review	Evidence-based algorithm for prophylaxis and treatment/management of PONV	Incidence of PONV prophylaxis	Utilization of Apfel score increased prophylaxis in patients at high risk for PONV	I: High
Kapoor, 2008[18]	Compare two instruments for assessing PONV	N=100, patients having non-cardiac surgery	Retrospective cohort	PONV risk assessment tool	Incidence of PONV	Implementation of a simplified PONV risk tool increased risk assessment rates but no difference in PONV rates between tools	IV: Good
Kolanek, 2014[19]	Apfel score to identify high risk for PONV, assess efficacy of multimodal treatment	N=5822, adult patients having non-cardiac surgery	Prospective observational	Multimodal PONV prophylaxis	Incidence of PONV	Apfel score to identify high risk for PONV then Multimodal PONV prophylaxis decreased PONV in PACU from 16.6% to 4.6%	IV: High

Kooij, 2008[20]	Improve PONV prophylaxis guideline adherence by implementing the Apfel simplified risk score electronically with automated reminders	N=5090, adult patients having non-cardiac surgery	Prospective, Interrupted time series	1) Electronic implementation of Apfel simplified risk score and automated reminders 2) Elimination of reminders	Incidence of PONV prophylaxis	PONV prophylaxis increased 35%, then returned to near-baseline after reminders eliminated.	IV: High
Kooij, 2010[21]	Improve PONV prophylaxis administration rate and timeliness of administration by implementing an electronic decision support system with automated reminders.	N=5652, adult patients having elective non-cardiac surgery	Prospective, Interrupted time series	1) Electronic implementation of a decision support system with automated reminders 2) Elimination of reminders	Incidence of PONV prophylaxis, timeliness of administration	Dexamethasone, Granisetron, timeliness of administration increased 49%, 28%, and 40% respectively. All values returned to near-baseline after reminders were eliminated.	IV: High
Kooij, 2012[15]	Improve prophylaxis for patients at high risk for PONV using Apfel score for PONV risk identification and automated reminders for PONV prophylaxis	N=2662, adult patients having elective non-cardiac surgery, general anesthesia	Prospective cohort	Electronic implementation of Apfel simplified risk score and automated reminders	Incidence of PONV, incidence of PONV prophylaxis	PONV decreased 4% for high risk group (HRG) and low risk group (LRG) overall, HRG by 17% alone. Dexamethasone for HRG increased 9%, LRG 7%. Granisetron for HRG increased 9%, LRG 6%.	IV: High
Sigaut, 2010[22]	Decrease incidence of PONV by implementing an educational strategy based on systematic preoperative assessment of the Apfel simplified risk score	N=384, patients having elective non-cardiac surgery, general anesthesia	Prospective cohort	Educational strategy based on systematic preoperative assessment of the Apfel simplified risk score	Incidence of PONV	PONV decrease by 41% between groups. PONV prophylaxis rose 16.4% in high risk group.	IV: High

Table 1: Evidence Appraisal

Apfel Score	Recommended Intervention
0-1	None
2	1-2 antiemetic interventions
3-4	3 or more antiemetic interventions
Interventions	
Primary (consider first): 4 mg ondansetron IV at end of surgery 4 mg dexamethasone IV at induction	
Secondary: Haloperidol 0.5-2 mg IM/IV at end of surgery Phenergan 6.25 mg- 12.5 mg IV at induction Aprepitant 40-80 mg PO 1-3 hours before surgery Scopolamine 1.5mg TD >1 hour before surgery Avoidance of volatile agent or nitrous oxide (Total intravenous anesthesia)	

Table 2: PONV reminder card (front) (Gan, et al., 2014)

Number of risk factors	Baseline risk	Risk with 1 Intervention	Risk with 2 Interventions	Risk with 3 Interventions	Risk with 4 Interventions
0	10%	7%	5%	4%	3%
1	20%	15%	11%	8%	6%
2	40%	29%	22%	16%	12%
3	60%	44%	33%	24%	18%
4	80%	59%	44%	32%	24%

Table 3: Projected patient PONV risk after intervention (Gan et al., 2014)

	Pre-implementation	Post-implementation	p-value
Patient Characteristics			
Age (average)	41	42	NS
ASA class I	14	19	NS
ASA class II	50	43	NS
ASA class III	5	7	NS
Positive Apfel Risk Factors			
Female gender	39	38	NS
Non-smoking status	60	58	NS
History of PONV or motion sickness	22	23	NS
Postoperative opioids expected	0	7	0.008
Apfel Simplified Score			
Apfel 0	4	2	NS
Apfel 1	19	18	NS
Apfel 2	37	39	NS
Apfel 3	9	10	NS
Apfel 4	0	0	NS

Table 4: Patient demographics with chi-square test

	Estimated	Observed
Apfel 0	2.9%	4.3%
Apfel 1	26.1%	18.8%
Apfel 2	56.5%	40.6%
Apfel 3	14.5%	36.2%

Table 5: Comparison of estimated and actual Apfel scores.

Appendices

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)

COMPLETION REPORT - PART 1 OF 2
COURSEWORK REQUIREMENTS*

* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details. See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- **Name:** Rusty Bledsoe (ID: 5744334)
- **Email:** rusty.bledsoe@usuhs.edu
- **Institution Affiliation:** Office of the Under Secretary of Defense (Personnel and Readiness) (ID: 603)
- **Phone:** 3012951055

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

- **Report ID:** 20629573
- **Completion Date:** 28-Aug-2016
- **Expiration Date:** 28-Aug-2019
- **Minimum Passing:** 80
- **Reported Score*:** 94

REQUIRED AND ELECTIVE MODULES ONLY	DATE COMPLETED	SCORE
Avoiding Group Harms - U.S. Research Perspectives (ID: 14080)	28-Aug-2016	3/3 (100%)
Recognizing and Reporting Unanticipated Problems Involving Risks to Subjects or Others in Biomedical Research (ID: 14777)	28-Aug-2016	5/5 (100%)
Populations in Research Requiring Additional Considerations and/or Protections (ID: 16680)	28-Aug-2016	5/5 (100%)
Module for Non-DoD Personnel Conducting Research Involving Human Subjects Supported by the DoD (ID: 16769)	28-Aug-2016	No Quiz
History and Ethics of Human Subjects Research (ID: 498)	28-Aug-2016	7/7 (100%)
Basic Institutional Review Board (IRB) Regulations and Review Process (ID: 2)	28-Aug-2016	5/5 (100%)
Informed Consent (ID: 3)	28-Aug-2016	5/5 (100%)
Social and Behavioral Research (SBR) for Biomedical Researchers (ID: 4)	28-Aug-2016	4/4 (100%)
Records-Based Research (ID: 5)	28-Aug-2016	3/3 (100%)
Genetic Research in Human Populations (ID: 6)	28-Aug-2016	5/5 (100%)
Vulnerable Subjects - Research Involving Children (ID: 9)	28-Aug-2016	3/3 (100%)
Vulnerable Subjects - Research Involving Pregnant Women, Human Fetuses, and Neonates (ID: 10)	28-Aug-2016	3/3 (100%)
FDA-Regulated Research (ID: 12)	28-Aug-2016	5/5 (100%)
Conflicts of Interest in Research Involving Human Subjects (ID: 488)	28-Aug-2016	5/5 (100%)
Office of the Under Secretary of Defense (Personnel and Readiness) (ID: 912)	28-Aug-2016	No Quiz
Cultural Competence in Research (ID: 15166)	28-Aug-2016	1/5 (20%)

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

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Phone: 888-529-5929
Web: https://www.citiprogram.org

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)

COMPLETION REPORT - PART 2 OF 2
COURSEWORK TRANSCRIPT**

** NOTE: Scores on this Transcript Report reflect the most current quiz completions, including quizzes on optional (supplemental) elements of the course. See list below for details. See separate Requirements Report for the reported scores at the time all requirements for the course were met.

- **Name:** Rusty Bledsoe (ID: 5744334)
- **Email:** rusty.bledsoe@usuhs.edu
- **Institution Affiliation:** Office of the Under Secretary of Defense (Personnel and Readiness) (ID: 603)
- **Phone:** 3012951055

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

- **Report ID:** 20629573
- **Report Date:** 28-Aug-2016
- **Current Score**:** 100

REQUIRED, ELECTIVE, AND SUPPLEMENTAL MODULES	MOST RECENT	SCORE
History and Ethics of Human Subjects Research (ID: 498)	28-Aug-2016	7/7 (100%)
Informed Consent (ID: 3)	28-Aug-2016	5/5 (100%)
Social and Behavioral Research (SBR) for Biomedical Researchers (ID: 4)	28-Aug-2016	4/4 (100%)
Records-Based Research (ID: 5)	28-Aug-2016	3/3 (100%)
Genetic Research in Human Populations (ID: 6)	28-Aug-2016	5/5 (100%)
Vulnerable Subjects - Research Involving Children (ID: 9)	28-Aug-2016	3/3 (100%)
Vulnerable Subjects - Research Involving Pregnant Women, Human Fetuses, and Neonates (ID: 10)	28-Aug-2016	3/3 (100%)
FDA-Regulated Research (ID: 12)	28-Aug-2016	5/5 (100%)
Office of the Under Secretary of Defense (Personnel and Readiness) (ID: 912)	28-Aug-2016	No Quiz
Conflicts of Interest in Research Involving Human Subjects (ID: 488)	28-Aug-2016	5/5 (100%)
Avoiding Group Harms - U.S. Research Perspectives (ID: 14080)	28-Aug-2016	3/3 (100%)
Cultural Competence in Research (ID: 15166)	28-Aug-2016	5/5 (100%)
Basic Institutional Review Board (IRB) Regulations and Review Process (ID: 2)	28-Aug-2016	5/5 (100%)
Recognizing and Reporting Unanticipated Problems Involving Risks to Subjects or Others in Biomedical Research (ID: 14777)	28-Aug-2016	5/5 (100%)
Populations in Research Requiring Additional Considerations and/or Protections (ID: 16680)	28-Aug-2016	5/5 (100%)
Module for Non-DoD Personnel Conducting Research Involving Human Subjects Supported by the DoD (ID: 16769)	28-Aug-2016	No Quiz

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

Verify at: https://www.citiprogram.org/verify/?25ad6ca0c-d232-4a49-9d32-9168264a5cee

Collaborative Institutional Training Initiative (CITI Program)
Email: support@citiprogram.org
Phone: 888-529-5929
Web: https://www.citiprogram.org

USU
University

OFFICE OF RESEARCH
4301 JONES BRIDGE ROAD
BETHESDA, MAYLAND 20814
PHONE: (301) 295-3303; FAX: (301) 295-6771

NOTICE OF PROJECT APPROVAL

Change Number: Original

VPR Site Number: GSN-61-10259

Principal Investigator: Bledsoe, Rusty

Department: Graduate School of Nursing

Project Type: Student

Project Title: Screening and Strategies to Prevent Postoperative Nausea and Vomiting

Project Period: 1/1/2018 to 6/1/2018

Assurance and Progress Report Information:

Name	Sup	Approval Type	Status	Approved On	Forms Received
Progress Report	0		Final	To be Submitted	N/A

Remarks:
This Notice of Project Approval has been reviewed and approved. Please remember that you must submit a final Progress Report (Form 3210) upon completion of this project.

Questions regarding this approval should be directed to the following person in the Office of Research:
Sharon McIver, (301) 295-9814.

[redacted]

6 Dec 2018

Yvonne T. Maddox, Ph.D. Date
Vice President for Research
Uniformed Services University of the Health Sciences

cc: Bledsoe, Rusty
File
Rusty Bledsoe

Clinical Investigation Department, Naval Medical Center Portsmouth
620 John Paul Jones Circle, Portsmouth, VA 23708 (757) 953-5939 Fax (757) 953-5298, DSN 377-5939

Thomas S. Rieg, PhD
Research Director

Kersten N. Wheeler, MS
Deputy Director
Division Head,
Research Subjects Protection

June G. Brockman, BA
Division Head,
Research Resources

Joanna E. Fishback, DVM
Major, VC, USA
Division Head,
Laboratory Animal Medicine

31 July 2017

From: Head, Clinical Investigation Department
To: LCDR Chad Moore, NC, USN

SUBJ: LETTER OF WAIVER OF IRB REVIEW FOR HEALTHCARE DELIVERY IMPROVEMENT PROJECT

1. Your project titled, "NHJX.2017.0011: Screening and strategies to prevent postoperative nausea and vomiting" does not require IRB review. Navy policy states that these types of healthcare delivery improvement projects are exempt from IRB review.

2. Projects that do not require IRB approval are not eligible for Clinical Investigation Department travel funds.

3. You will still need to obtain publication approval for the project which is required for all works presented or published outside of your Command.

4. I remain available and may be reached at (757)953-5939.

[redacted]

T. S. RIEG

REQUEST FOR PUBLICATION/PRESENTATION APPROVAL (RPPA)

Please read the following important instructions:

- All authored works (manuscripts, presentations, posters, etc.) to be delivered in an official or personal capacity must be reviewed by your Director, Department Head, Research Department, Public Affairs Officer (PAO), Hospital Legal Counsel, Executive (XO) and Commanding Officer (CO).
- All authored works which are being delivered in an official capacity should be submitted using the Naval Hospital Jacksonville (NAVHOSPJAX) templates located under Special Assistants - Research - Research and Publications.
- Please complete this form and email it to the Research Department by using this link:
  - Email to usn.jacksonville.navhospjaxfl.list.research@mail.mil. Only send the completed/signed form.
  - Attach your manuscript/presentation/poster. If you are submitting a large PowerPoint file, compress the images to ensure the file is small enough to send via email. If it is still too large, contact the Research Department for assistance.
- Allow three weeks for the approval process.
- If your materials concern controversial topics or issues of media interest or if your materials may affect the plans, policies, programs or operations of the Department of Defense (DoD) or the U.S. Government, the NAVHOSPJAX PAO may need to escalate to the Navy Medicine East (NME) PAO. The NME PAO will either approve or escalate to the Bureau of Medicine and Surgery (BUMED) PAO.
  Allow 21 days for BUMED review alone. Allow an additional 20 working days for manuscripts and materials requiring review from higher authority (DoD/Secretary of the Navy/Chief of Naval Operations). Review may take longer depending upon the complexity or sensitivity of the material or the number of commands that must review the material.
- Please note that abstract approval does not constitute approval of the full paper or presentation based on the abstract; ***any version of the same material requires review.***
- If you need to expedite the process, notify your Department Head that you have an RPPA on the way.
- Approval of the content does not constitute approval for travel. Please upload a copy of the approved RPPA into the Defense Travel System (DTS) along with the travel attestation when requesting orders to speak in an official capacity.
- Please contact the Research Department if you need further assistance at: 904-542-7087, or via email at: usn.jacksonville.navhospjaxfl.list.research@mail.mil.

NAME *(Last, First, MI)*: Moore, Chad B.		Corps: Nurse
Rank: LCDR	Position: Director USU GSN DET JAX	Email: chad.moore@usuhs.edu
Phone: 904-864-5321	Department Head *(Full Name and Rank)*: Arthur K. Lammers, LCDR	Fax:
Department: Anesthsia	Director *(Full Name and Rank)*: Carol A. Burroughs, CAPT	Deadline for Approval: 12 April 2019
Directorate: Surgical Services		Journal/Conference Deadline: 12April2019
Journal ☐ Conference ☒		
If this is a presentation, is your audience all DoD? Is it possible that members of the media or the public will be in attendance? DOD presentation open to the public. TSNRP Annual Dissemination Course. Poster and powerpoint oral presentation.		

REQUIREMENTS

Please answer the following questions:	Yes	No	NA
Does your manuscript/poster/presentation include the **required identification (rank, corps and command)?**	◉	○	○
Does it include the **required disclaimer**?	◉	○	○
If this is research, does it have research approval? **If yes, include a copy of the IRB approval notice with your materials and complete #4 on page 2.**	◉	○	○
Does it contain the required **CIP statement**?	○	○	◉
Does it contain the required **copyright statement**, if applicable?	◉	○	○

See page 2 for details and to copy and paste the appropriate required statements to your authored work.

OPTIONAL COMMENTS
Update from earlier submission after editing.

The request is for public release. The planned places for release are: USU Research Days poster presentation and web-archive, Triservice Nursing Research Program poster presentation and podium presentation, MHS research symposium poster session, and American Association of Nurse Anesthetists Foundation state of the science poster presentation and oral Poster Tours competition.

Other DoD Agency or Command to which this material has been submitted for approval. **Submission Date:** Apr 8, 2019

REQUIRED ELEMENTS

Navy Instruction requires that publications/presentations contain the following elements:

1. ***Military Identification:*** Manuscripts and professional articles completed in an official capacity, or funded by the Government, **must identify** the author with complete name, **military grade, title and command.**
2. ***Disclaimer:*** The following disclaimer must be included in all materials (you may copy and paste it to your document). *The views expressed in this article are those of the author(s) and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense or the United States Government.*
3. ***Copyright Statement:*** Authors of official approved manuscripts cannot enter into any agreement that offers the publication exclusive rights. Government work, articles and manuscripts prepared by Government employees in the course of their official duties cannot be copyright protected. Most publishers recognize this copyright limitation and may have alternative acknowledgements. **If your publisher has another agreement or government statement of work, please attach it with your materials when submitting them for review and approval.** Otherwise, the following copyright statement should be attached to all Government work when submitted to civilian media for publication. You may copy it from this form and paste it to your document:

   I am (a military service member) (an employee of the U.S. Government). This work was prepared as part of my official duties. Title 17 U.S.C. 105 provides that "Copyright protection under this title is not available for any work of the United States Government." Title 17 U.S.C. 101 defines United States Government work as a work prepared by a military service member or employee of the United States Government as part of that person's official duties.

4. ***Research Approval, if applicable:*** Publications citing research must include evidence of ethics oversight. Please provide the following information:

   NMCP CIP (# NHJX.2017.0011) PI: LCDR Moore

   ☐ Other institution (name and assigned number) _____

5. ***Research publications must contain the following statement of ethics oversight*** (or a similar one if the research was done at an institution other than NMCP), You may copy it from this form and paste it to your document.

   Research data derived from an approved Naval Medical Center, Portsmouth, VA IRB [IACUC].

PLEASE NOTE THE FOLLOWING:

1. Provide the CIP number in #4 of the required elements above but **do not** include the CIP# in your authored work.
2. The statement of ethics oversight may be placed on the title page or in the first paragraph of the methods section of the manuscript. It must also be included on posters and presentations.

Not applicable/Not research. Non-human subjects letter included in submission.

Department Head Recommendation: (•) Approve ( ) Approve with comments ( ) Return to author for revision, discussion [ ] Disapprove	**Director Recommendation:** (•) Approve ( ) Approve with comments ( ) Return to author for revision, discussion ( ) Disapprove
Department Head Comments:	**Director Comments:**
Department Head Name *(print or type)*: LCDR Arthur K. Lammers, D.O.	Director Name *(print or type)*: Carol A. Burroughs DSS
Department Head Signature: LAMMERS.ARTHUR.K.1241857243 Digitally signed by LAMMERS.ARTHUR.K.1241857243 Date: 2019.04.08 16:50:04 -04'00' Date: 4/8/2019	Director Signature: BURROUGHS.CAROL.ANN.1153571976 Digitally signed by BURROUGHS.CAROL.ANN.1153571976 Date: 2019.04.12 17:37:40 -04'00' Date: 4/12/19
NHJAX Public Affairs Officer Recommendation: ( ) Approve (•) Approve with comments ( ) Return to author for revision, discussion ( ) Disapprove ( ) NHJAX PAO to forward to NMCP/NME PAO; approval/disapproval ( ) NMCP/NME PAO to forward to BUMED PAO; approval/disapproval	**Clinical Investigation Department (CID) Recommendation:** Study Status: (•) Approve ( ) Approve with comments ( ) Return to author for revision, discussion ( ) Disapprove
NHJAX Public Affairs Officer Comments: See PAO coments.	**CID Comments:**
NHJAX Public Affairs Officer Name *(print or type)*: Yan Kennon	CID Name *(print or type)*: Almer Mendoza, Research Assistant
[redacted] Date: 4/17/19	[redacted] Date: 04/23/19
BUMED Public Affairs Officer Recommendation: (•) Approve ( ) Approve with comments ( ) Return to author for revision, discussion ( ) Disapprove ( ) Not Required	**NHJAX Legal Counsel Recommendation:** (•) Approve ( ) Approve with comments ( ) Return to author for revision, discussion ( ) Disapprove
BUMED Public Affairs Officer Comments: Old version of RPPA used. OpSec approval email attached.	**NHJAX Legal Counsel Comments:**
BUMED Public Affairs Officer Name *(print or type)*:	NHJAX Legal Counsel Name *(print or type)*: Chris D. Tucker
BUMED Public Affairs Officer Signature: Date:	[redacted] Date: 4-23-2019
Command Action: (•) Approve ( ) Approve with comments ( ) Return to author for revision, discussion ( ) Disapprove Please note that abstract approval does not constitute approval of the full article or presentation. Similarly, approval of the content does not constitute approval for travel.	**NHJAX Command Official Comments:** NHJAX Command Official Name *(print or type)*: M. CASE CO [redacted] Date: 04/23/2019

NAVHOSPJAX 5700/1 (2-2015)

PACU Staff Test

Self-selected 4 digit PIN _____

1. What is your current profession?
A. Anesthesiologist
B. CRNA
C. SRNA
D. RN
E. PACU Staff

2. How long have you been working in your current profession?
A. 0-5 years
B. 5-10 years
C. 10-15 years
D. more than 15 years

4. Highest level of education completed
A. Technical training
B. Associates Degree
C. Bachelor's degree
D. Master's
E. Doctorate

5. Where is nausea interpreted in the brain?
A. Vestibular system
B. Chemoreceptor trigger zone
C. Vomiting center
D. Cerebellum

6. Which of the following is NOT a characteristic of vomiting?
A. Witnessed retching
B. Greenish hue
C. Non-particulate
D. Patient confirmation

7. What is the general occurrence rate of PONV?
A. 10%
B. 20%
C. 30%
D. 60%

8. Which of the following increases a patient's risk for PONV?
A. Total intravenous anesthesia
B. Smoking
C. Age over 40

D. Female gender

9. How are you going to ask English-speaking patients if they are nauseous?
A. Are you feeling nauseous?
B. Do you feel like you are going to vomit?
C. How do you feel?
D. Am I making you sick to your stomach?

10. Where should you chart that the patient vomited?
A. Nursing narrative note
B. At the top of the Vital Signs flowsheet
C. On the "Nausea" row in the Vital Signs flowsheet
D. In the patient's MAR

11. Where should you chart that the patient is nauseous?
A. Nursing narrative note
B. At the top of the Vital Signs flowsheet
C. On the "Nausea" row in the Vital Signs flowsheet
D. In the patient's MAR

12. Where should PACU nurses routinely get the Apfel score and antiemetic interventions used?
A. Anesthesia intraop record
B. Preanesthesia evaluation
C. Ask the patient
D. Anesthesia provider during SBAR

PACU Staff Test Answer Key (answers in RED)

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12. Where should PACU nurses routinely get the Apfel score and antiemetic interventions used?
A. Anesthesia intraop record
B. Preanesthesia evaluation
C. Ask the patient
D. Anesthesia provider during SBAR

Anesthesia Provider Test

Self-selected 4-digit PIN _____

D1. What is your current professional role?
A. Anesthesiologist
B. CRNA
C. SRNA

D2. How long have you been privileged as an anesthesia provider?
A. Less than 3 years
B. 3-10 years
C. more than 10 years

K1. How does Nitrous Oxide contribute to risk for PONV?
A. Nitrous has no effect
B. Nitrous decreases the volatile anesthetic used; decreases risk for PONV
C. Nitrous adds to risk from the volatile anesthetic; increases risk for PONV

K2. Which of the following triggers nausea through release from enterochromaffin cells in the GI
tract?
A. Pepsin
B. Amylase
C. Trypsin
D. Serotonin

K3. Which is the strongest predictor for PONV?
A. Previous history of PONV
B. Length of surgery
C. Female gender
D. Abdominal or GYN surgery

The following scenario applies to questions K4-K6

K4. You have a 35-year-old female patient who smokes ½ PPD scheduled for a 3-hour total abdominal hysterectomy with a history of PONV. Your PACU orders include opioids for pain. Her Apfel score is?
A. 1
B. 2
C. 3
D. 4

K5. What is her level of risk for developing PONV?
A. Low
B. Moderate

C. High

K6. Based on the Apfel score, the number of antiemetics that should be administered is?
A. None
B. 1-2
C. 3 or more

K7. The Apfel score is a useful tool for MAC and TIVA cases
A. True
B. False

K8. When are exceptions to this protocol warranted? I.e. give more (or less) antiemetic than is usually recommended?
A. Safety exception, e.g. jaw wired-shut or risk for dehiscence with retching
B. Patient expressed extreme fear of PONV
C. Pediatric cases
D. All of the above

K9. According to Apfel, which is an independent risk factor for PONV (select 4)?
A. Duration of surgery or anesthesia
B. Non-smoker
C. Breast or GYN surgery
D. Nitrous oxide
E. Poor hydration preop (8hr fasting)
F. Prior PONV or motion sickness
G. Female gender
H. Postoperative Opioids
I. Age

Anesthesia Provider Test Answer Key (answers in RED)

Self-selected 4-digit PIN _____

D1. What is your current professional role?
A. Anesthesiologist
B. CRNA
C. SRNA

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A. True
B. False

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E. Poor hydration preop (8hr fasting)
F. Prior PONV or motion sickness
G. Female gender
H. Postoperative Opioids
I. Age

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: Postoperative Nausea and Vomiting Prevention: Screening and Interventions was completed at Naval Hospital Jacksonville by the following student(s):

(type student name)	*(signature)*	*(date)*
LT Rusty Bledsoe	[redacted]	04FEB2019

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:

(type name)	*(signature)*	*(date)*	
LCDR Chad Moore	[redacted]	04FEB2019	Senior Mentor
LCDR Justin Hefley		04FEB2019	Team Mentor
LCDR Chad Moore		04FEB2019	Team Mentor & Phase II Site Director

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

CDR Kennett Radford	[redacted]	21 APR 2019
RNA Project Director *(type name)*	*(Signature)*	*(Date)*

Form Version: 26 Aug 2017