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DOCUMENTATION OF VITAL SIGNS
DURING THE POST-OPERATIVE PHASE

A Major Paper Presented

by

Jennifer Susan Thran

Approved:

Committee Chairperson	_____	_____
		(Date)
Committee Members	_____	_____
		(Date)
	_____	_____
		(Date)
Director of Master's Program	_____	_____
		(Date)
Dean, School of Nursing	_____	_____
		(Date)

DOCUMENTATION OF VITAL SIGNS
DURING THE POST-OPERATIVE PHASE

by

Jennifer Susan Thran

A Major Paper Submitted in Partial Fulfillment

of the Requirements for the Degree of

Master of Science in Nursing

in

The School of Nursing

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Abstract

Post-Anesthesia Care Units (PACUs) were introduced in the 1930s to address excessive post-operative morbidity and mortality rates. The PACU provides an area where patients recovering from anesthesia can be observed intensely and treated appropriately until they return to a stable physiological state. Measurement of vital signs has always been a central task of the nurses providing care in the PACU; abnormal vital signs indicate an unstable patient and the possibility of an adverse event. Over time, both hospital policies on conduct of care in the PACU, including documentation of vital signs, and the technology for measuring vital signs have evolved. Measurement of vital signs has been automated, with indicators measured either continuously or at timed intervals. This automation may produce unintended consequences including conflicts between the technology and policy and the tendency for nurses to document vital signs as a matter of routine rather than a means of delivering patient-centered care. This retrospective chart review was conducted to identify the prevalence of non-compliance with hospital policy on frequency of vital sign documentation in adult ASA I and II patients of any gender undergoing general anesthesia for an outpatient procedure. The results of this study showed non-compliance occurred in 18% of the sampled records. Recognizing such gaps in vital sign documentation, will better enable the Advanced Practice Nurse (APN) to facilitate effective discussions about the benefits of appropriate documentation and patient care. The APN can support nurses and their organization by advocating for continued involvement in policy development and staff education.

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Documentation of Vital Signs During the Post-Operative Phase

Background/Statement of the Problem

Vital signs are an indication of current physiological status; they include respiratory rate, heart rate, blood pressure, temperature, and pain level. The observation and assessment of vital signs is crucial for predicting and preventing clinical deterioration. For patients who have undergone a procedure requiring intravenous or inhaled anesthesia, vital signs are captured frequently to monitor physiological stability. The frequency of vital sign measurement during the post-operative period in a given institution typically follows guidelines established by the American Society of Anesthesiologists (ASA) and adopted by the American Society of Perianesthesia Nurses (ASPAN). These guidelines are based on factors such as type of anesthesia, surgical site, clinical status, co-morbidities, and provider orders. Since the guidelines are recommendations and do not establish a standard of care, individual institutions determine their own population-specific departmental policies and protocols.

The optimal area to perform monitoring in patients who have received anesthesia is in a location with readily available rescue equipment, monitors, advanced cardiac life support (ACLS) nursing staff, Medical Doctors, and Advanced Practice Registered Nurses (APRNs). In hospitals and ambulatory surgical centers this designated area is called the Post-Anesthesia Care Unit (PACU). Modern PACUs are considered critical care areas due to the potential for rapid physiological deterioration that can occur at any time while emerging from general anesthesia.

The first PACUs began to appear in the United States in the mid-1900s, however, the development of the scope of practice for PACU nurses only began in 1986 when

ASPAN published their first guidelines for perianesthesia nursing. ASPAN continually updates and revises clinical monitoring recommendations to stay current with the evolving healthcare environment; the most recent update was published in 2014 and adopted into practice in 2015 based on ASA guidelines.

While there is ample evidence linking the existence of PACUs to reduced morbidity and mortality (Haret, Kneeland, Ho, Block, & Helfman, 2012), the literature has been silent about the frequency of vital sign collection and the effect of such documentation on outcomes. In fact, ASA and ASPAN guidelines do not recommend a specific frequency of vital sign collection. This issue was addressed by Zeitz and McCutcheon (2006) who found frequency of vital sign collection in the first 24 hours after surgery, including time in the PACU, has been based on dogma. A search of the literature since that time revealed a persistent lack of research on frequency of vital sign collection in the PACU. Information on the frequency of vital sign collection continues to be limited to informal surveys and appears to be based on ritual and local custom (Burchill, Anderson, & O'Connor, 2015). The only reference to PACU vital sign collection frequency comes from *Miller's Anesthesia* which recommends "vital signs are recorded as often as necessary, but at least every fifteen minutes while the patient is in the unit" (Miller, Eriksson, Wiener-Kronish, & Young, 2010, p. 2708).

There is no doubt that a critical role of the PACU nurse is the surveillance and documentation of vital signs to assess progress toward recovery from anesthesia and return to the baseline level of consciousness. The lack of specific recommendations on vital sign frequency in the PACU offered by ASA and ASPAN has driven individual institutions to create their own policies and protocols. These policies are often written in

broad language to allow for appropriate nursing-assessment-driven, individualized patient care but these policies rely on routine rather than evidence. Policy-driven collection of vital signs should not replace patient-centered care. Nurses assigned to the PACU must possess and utilize critical care thinking skills and remain vigilant for the slightest change in patient status for optimal patient safety and outcome.

Literature Review

A literature search was performed to identify whether vital sign frequency is influenced by policy, best current evidence, or customary nursing practice. The databases utilized included CINAHL, Medline, Ovid, and PubMed. The search parameter was 1995–2017. The keywords included vital signs, frequency, post-operative care, post-operative documentation, and evidence-based practice.

Vital Signs

The term “vital sign” is universally recognized and practiced in health care disciplines. It is a term used to describe the physiological status of a person at a specific point in time. Vital sign measurements collected using manual or automated equipment, reveal data needed to adjust interventions for optimal patient outcomes. PACU vital signs include blood pressure, heart rate, oxygen saturation, respiratory rate, level of consciousness, temperature, and pain level. Additional physical observations used to identify a change in condition include, but are not limited to, skin tone and temperature, swallow reflex drain and catheter output, neurologic status, nausea, and vomiting (Zeitz & McCutcheon, 2006). What determines a “normal” vital sign varies based on patient-specific physiological needs, provider practice, and individual institution policies. Specialty medical organizations have practice-specific standards and recommendations for optimal vital sign parameters for the population to whom they provide care. The ASA determined normal vital sign parameters to be $\pm 20\%$ of baseline initial vital signs, while undergoing a procedure under intravenous or inhaled anesthetic (ASA, n.d.). The ASA emphasizes the importance of noting the presence of contributing signs and symptoms the exhibited by the patient in relation to the documented vital signs. Ultimately, a normal

vital sign will vary significantly from person to person, and related situations must be considered when interpreting vital signs.

Schulman and Staul (2010) provided expert opinion on the frequency of vital sign measurement and documentation. The authors referenced the statement on vital sign documentation frequency by the American Association of Critical Care Nurses (AACN). The AACN acknowledged allowing experts within a department-specific setting to determine the best population-based standard was more important than defining a national standard for vital sign data collection. The authors argued policies on specific intervals for vital sign documentation should be based on patient population and need-based care. Each patient has a unique biophysical makeup that drives the care plan and is not always conducive to a standardized structure of documented tasks. Policy updates must allow the bedside nurse to deviate from the recommended frequency based on observation and judgement. The authors also addressed the limitations of a rigid or structured protocol, and concluded it is not best practice to perform such structured care. Mandatory documentation can become a burden to the bedside nurse when it takes precedence over addressing the physical needs of a patient. The authors concluded assessment is not always associated with documentation yet is a routine part of bedside nursing care and should allow for the assigned nurse to document based on changes in condition (Schulman & Staul, 2010).

In a systematic review, Tysinger (2015) sought to determine the impact of vigilance and the prevention of patient deterioration. Six of 1,265 articles met inclusion criteria for collection, measurement, and documentation of vital signs in adult hospitalized patients. The studies were qualitative, cross-sectional, observational, and

retrospective. Multiple physiologic variables such as blood pressure, heart rate, oxygen saturation, respiratory rate, and temperature can be bundled as part of an *early warning system*. Tysinger learned this warning system may predict the probability of a worsening clinical situation in hospitalized adult patients. Alone, this system has limitations but when used as part of a nursing assessment, the nurse can identify patterns and use clinical judgement to increase frequency of assessment. The bedside nurse's increased vigilance can result in increased documentation to support actions taken. The author concluded the practice of vital sign monitoring is important, but not the sole indicator of status instability.

McGhee, Weaver, Solo, and Hobbs (2016) addressed the lack of clinical guidelines pertaining to vital sign reassessment in the emergency department (ED). The authors retrospectively examined 202 random adult emergency room charts to identify whether frequent monitoring of vital signs could prevent physiological deterioration. The research showed nurses working in the ED performed vital sign documentation based on patient acuity and doctors' orders instead of specific time intervals. Additionally, frequency of documentation was inconsistent when based on nursing judgement and routine observation. Gaps in consistency can lead to an unnoticed decline in condition and result in an adverse event for the patient. Therefore, the authors recommend ED managers develop policy for their department based on a scale of acuity. The acuity scale — Emergency Severity Index (ESI) — was developed for continuity within emergency departments. A patient deemed to be an ESI level 1 requires documented vital signs every five to 15 minutes for four hours. The frequency decreased progressively to an ESI level 5, requiring documented vitals on admission and discharge, or as needed (McGhee et al.,

2016). This study demonstrates the importance of policies based on the physical presentation of a patient and best practices. The authors recommended further research regarding ESI scale use and incorporation into policy.

Cardona-Morrell, Prgomet, Turner, Nicholson, & Hillman (2016) performed a systematic review and meta-analysis exploring continuous and intermittent monitoring in general medical wards. Inclusion criteria consisted of adult hospital inpatients, with any condition connected to a vital sign monitor. Twenty-two clinical studies met the inclusion criteria. These studies included observations of 203,407 patients. The researchers sought to answer two questions — Are certain strategies being utilized to support improved vital sign monitoring? And, are these strategies preventing adverse events? Strategies identified to monitor vital signs included manual and automatic bedside, portable, and patient worn equipment. The researchers found continuous monitoring enhanced earlier identification of deterioration ($p < 0.001$), while intermittent monitoring resulted in an increase of adverse events reporting ($p = 0.001$). The researchers were unable to determine whether frequency of monitoring (continuous or intermittent) significantly impacted the patients' outcome or length of stay. Factors such as underlying cause for hospital admission, pre-existing conditions, and the level of care were not considered indicators that impacted outcomes. The researchers indicated a need for further research on optimal frequency of vital sign documentation for hospitalized patients.

Post-Operative Vital Sign Collection

Zeitz and McCutcheon (2002) developed a research project exploring the type, frequency, and variability of vital sign monitoring and the factors involved in the development of policies guiding vital sign monitoring in hospitals in the state of South

Australia. The goals of the study were to (a) determine whether the practice of observing post-operative vital signs is based on hospital policies, (b) identify those policies and the persons or entities who contributed to the development of the policies guiding nursing practice, and (c) examine whether policies are consistent among various hospitals. The researchers used a survey method to obtain data from 47 hospitals. They found 36 hospitals had policies that guided a routine practice of vital sign monitoring in the first 24 hours after surgery. These included a fixed frequency of observations. The other 11 hospitals either did not describe vital sign observation for the full 24 hours or allowed for medical officers or nurses to determine the frequency of vital sign observation at their own discretion. In the hospitals where formal policies were in place, the researchers found policies and procedures are nurse-driven and nurse-endorsed, but much input is based on clinical and individual experience rather than evidence-based data. The authors suggested the process of vital sign observation and documentation is a widespread practice driven largely by institutional policy and not by individual patient needs. They concluded continued research should be directed toward changing the practice of post-operative monitoring from tradition-based to evidence-based.

Post-operative implies the time-frame following a surgical procedure requiring an anesthetic, starting in the PACU until discharge to an inpatient unit or home. The purpose of frequent vital sign collection during this post-operative period is to rapidly identify any physiological change in condition. Timing of these intervals are typically determined by a standardized formula developed by individual institutions rather than based on patient need. Guidelines of care and practice for the post-operative patient has been issued by ASA and adapted by ASPAN. These guidelines state vital signs must be obtained and

documented in the post-operative care area no less than every 15 minutes. Change of physiological status, medication administration, and clinical bedside nursing observation are examples of a need to increase frequency (Allen et al., 2014).

Burchill et al. (2015) conducted a study to explore bedside nurse attitudes and practices of post-operative vital sign collection. Modern anesthesia and current technology have allowed for better post-surgical outcomes, including fewer side effects from antiquated medication administration. These significant changes to the practice of anesthesia improve patient satisfaction by providing faster recovery times. This influence has increased the need for post-operative nurses to modify their practices. The researchers developed a cross-sectional descriptive study to examine the relationship between frequency of vital sign documentation and nurse attitude toward the documentation practice. A survey was issued, and data was collected from 143 registered nurses in a large urban Magnet hospital. The first question addressed post-operative vital sign collection regimen. The researchers found nurses practiced vital sign collection as part of a standardized pattern. Further questions were used to identify the vital signs nurses classified as monitoring priorities and the factors nurses considered when interpreting vital sign data. The majority (96%), replied that an abnormal vital sign would prompt a repeat measurement. All participants reported clinical judgement would drive a reassessment of clinical status if the patient had other concerning physiologic indicators, regardless of vital sign range. The authors concluded the practice of post-operative vital sign collection is a matter of habit and ritual, and nurses have not adjusted their practice to current anesthesia techniques. Continuing the practice of non-evidence-based vital sign

collection can lead to false confidence in data rather than patient status (Burchill et al., 2015).

Evidence-Based Practice

The importance of evidence-based nursing practice has evolved and normalized in recent years. Developing programs to assist with practice change has occasionally been met with resistance from nurses who have practiced for many years. The nurses who resist often rely on prior experiences or assumption rather than evidence or patient need. Ritual can lead to a negative interpretation of action — an unthoughtful act — yet can also express a positive action, such as following an algorithm.

Rituals, both positive and negative, were explored by Philpin (2002) who wrote a critical commentary of the reasons bedside nurses practice the way they do. Philpin defined ritual as a phenomenon consisting of tasks to be completed. Utilizing a ritualistic pattern of workflow was found to ease anxiety but was not always consistent with the rationale for completing a task. Performance of tasks and attention to detail support optimal nursing care and documentation. The author argued perceived lack of decision-making or control leads to the use of ritualistic behavior to manage the stress of ambiguity and unpredictability. The author identified positive and negative outcomes associated with a structured practiced workflow. An example of a positive patient outcome is an abnormal finding (e.g., incidental finding on an X-ray) that occurs while following a generalized plan. In contrast, a lack of intellectual reasoning about the need to assess the potential for an incidental finding may have a negative impact on the patient. Philpin expressed understanding of customary actions in nursing care, and possible deficits of nursing knowledge regarding follow-through in light of adverse events. The

author concluded evidence-based practice in nursing, resolves apprehension when undertaking an assignment or assessing a difficult or unknown situation, thus offering an opportunity for optimal patient care.

Researchers at St. Luke's Episcopal Hospital, in Houston, Texas, developed a model for dissemination of evidence-based care and practice (Anderson, Mokracek, & Lindy, 2009; Appendix A). The model represents a process for (a) identifying a potential issue or area for clinical improvement, (b) understanding the reason(s) the issue must be addressed, and (c) designing, testing, and implementing change. The basis for change implementation must come from literature that reveals evidence of best practices and long-term benefits associated with the practice change. Ongoing evaluation and the clinical context for the change are as important as the identification of the areas for improvement. The researchers discussed the process of developing a best practice council for nursing and the implementation of pilot programs to test the change prior to policy integration. By focusing on change of practice in four areas, the researchers implemented the St. Luke's model and noted benefits for using the model. These benefits included decreased rates of central line catheter infection, decreased hospital falls and pressure ulcers, and increased positive hand-off communication. Researchers reported the newly formed best practice council acknowledged the structure of the model and provided a uniform track for problem solving and timeline for change (Anderson et al., 2009). Evidence-based practice remains the gold standard for patient care. By initiating and implementing this model universally, future evidence-based practice changes within the hospital can be guided and supported effectively.

Vital Sign Collection in the PACU

Current ASA standards state vital sign documentation of a PACU patient should occur every 15 minutes, at minimum, but can be adjusted to meet patient-specific needs (ASA, n.d.). An example of need that would necessitate adjustment is caring for a patient currently on a lifesaving medication or with an airway support. These patients would require closer monitoring due to the higher risk of adverse effect and mortality, however while the monitoring may be continuous, the documentation may not be.

Population specific policies are used to define procedures and practices involving the care of a patient in the first 24 hours following a surgery that required an inhaled or intravenous anesthetic. Zeitz (2003) examined whether the practices and procedures performed by nurses were evidence-based, informed by current policy, or routine. One private and one public hospital, with different post-operative care policies, were selected as study sites. At both hospitals, nurse patient interaction occurred 3.5 times per hour for the first four hours, then decreased to 2.1 in the 13- to 24-hour time frame (Zeitz, 2003). Twenty-two percent of that time was spent taking and recording vital signs. Vital sign and physical status assessment parallel traditional design, once every hour times 4, once every 3 hours times 4, then one every four hours times 4 while in the hospital. These patterns were revealed as part of hospital culture not hospital guidelines. Additional results showed vital sign collection was not the sole reason for nurse-patient interaction. Assessment of intravenous fluids and comfort level prompted interaction but were also part of a routine rather than a patient-based need. The detection of actual and potential post-operative complications was incidental to an assessment, suggesting the practice of traditional observation is not evidence-based.

Zeitz and McCutcheon (2005) discovered evidence-based policy is not commonly reflected in nursing documentation of patient care, which suggests a lack of evidence in policy development, nursing practice, or both. To understand barriers to changing nursing practice, the researchers performed a literature review using evidence-based practice, standards, and clinical judgement as keywords. The search produced 39 articles. Novice nurses use traditional practice to develop a system for assessment of patient needs and concerns as they expand their clinical judgment. The researchers argued the standard can ultimately devolve into ritual rather than patient-based care or assessment. They further suggested routine practice does not activate explicit knowledge about the purpose of performing a task and can lead to inefficiency. Reluctance to deviate from comfortable clinical practices and skepticism about the need for change were identified as primary barriers to change. Institutions create policy protocols based on existing practice literature and evidence, with an allowance for clinical judgement to drive documentation frequency; Yet the researchers found nurses prefer to document according to traditional patterns rather than patient-based needs. Behaviors are often ingrained and can be challenging to change, especially in the continually evolving world of nursing. Rituals create predictability and are often performed to reduce anxiety about missing a step. Many nurses resist changes in practice, to avoid the possibility of missing steps. Zeitz and McCutcheon suggested implementing changes in small steps and empowering nurses to decide the rate of speed for practice change. The authors also suggested evaluation of and feedback about the changes would guide policy development and produce positive patient outcomes.

Collins et al. (2013) sought to understand why nursing documentation is vital to a patient's outcome by exploring documentation frequency and mortality rates. The researchers showed physicians depend on nursing flowsheets and documentation of normal or abnormal physiological status in the EHR). Specifically, comments and notations are helpful when entered as part of the timeline of change in status. These changes may prompt a higher frequency of documentation and the accompanying notes reveal a cause or reaction to a treatment. In the case of an adverse finding or event, a nurse can mobilize a rapid response team to assist with identification and prevention of worsening patient conditions. The authors noted nursing action is typically related to personal experience, knowledge, and intuition, yet documentation may not always support what is observed by the bedside nurse. The mismatch can lead to potential interruption of intervention and an increase of poor outcomes. The researchers conducted a retrospective chart review of 15,000 acute care non-cardiac arrest patients, and 145 acute care cardiac arrest patients, utilizing the Age Adjusted Carlson Comorbidity Index (AACC) to compare and stratify patient populations. Examination of EHR documentation over a 48-hour length of stay showed significant negative outcomes among patients with a low to moderate comorbidity index (Collins et al.,2013). Recording of optional comments and frequency of documentation were statistically associated with the patient's physiological status and deterioration. The authors could not positively determine whether nursing documentation was prompted by ritual or evidence, thus highlighting the need for patient-based care and event documentation.

Protocols for Vital Sign Collection in PACU

Newport Hospital's (2016a) PACU policy # 103 *Admission to and Ongoing Care of the Patient in the Post-Anesthesia Care Unit*, outlines standards for delivering the highest level of care for the post-operative patient. Documentation must include assessment of physiologic systems, surgical wound and drains, intravenous patency, and ongoing vital sign recording at a minimum of every 15 minutes. Documented vital signs consist of the cardiac rate and rhythm, blood pressure, oxygen saturation, respiratory rate, temperature, pain level and level of consciousness. Additional factors such as skin color and tone and intake and output volumes should also be recorded in the electronic health record (EHR). Notification of abnormal vital signs or emergent care must be reported to the anesthesiologist who is responsible for providing medical care to the patient while in the PACU.

Another Newport Hospital (2016b) policy, PACU #143 *Discharge Criteria*, states vital signs must be stable for the 30 minutes preceding discharge before a patient can be discharged to home following inhaled or intravenous anesthesia. Specifically, heart rate, systolic blood pressure, respiratory rate, oxygen level, and temperature must be within 20% of baseline. The policy also dictates patients must: be awake with an appropriate level of consciousness, maintain liquids, urinate (dependent on procedure), and have a physician order for discharge, before leaving the department with a responsible adult.

Both policies are: written in accordance with current ASA policies and the 2015 ASPAN standards and recommendations, approved by the director of peri-operative services and the chief nursing officer, and have been revised within the last 12 months. The ASA is the highest governing body to oversee and support practices related to patient

care involving anesthesia. Standard 1-2 by the Standards and Practice Parameters Committee of the ASA, states policies regarding medical care in the PACU must be reviewed and approved by the anesthesia department head (Anesthesiology, 2013). The ASA task force on post-anesthetic care relies on evidence-based research to provide recommendations and develop practice guidelines. Topics researched include medication administration, physiological management, and discharge protocol. Recommendations are created based on meta-analysis and expert opinion.

Theoretical Framework

Behaviors and interactions are typically derived from a person's framework of beliefs and attitudes. A person's beliefs and attitude shape their interpretation of the environment or situation, in turn, the interpretation leads to a reaction driven by past their experiences or intentions. Ajzen studied individual behaviors and developed a framework called the theory of planned behavior (Ajzen & Fishbein, 1975; Figure 1). To date, psychology research using this theory has repeatedly demonstrated a person can be conditioned to complete tasks based on their personal beliefs or attitudes. While multiple influences and internal factors can cause a person to act in certain manner, tasks can become repetitive. Rooted in theories of learning, expectancy, balance, and attribution, the theory of planned behavior posits an assumed action with a predictable outcome will likely be repeated when the same steps are taken in a planned fashion. When new variables arise during an action, the person must decide to alter their behavior or continue as they planned. This theory best reflects the need for more evidence-based data to support policies for determining the frequency of vital sign collection in the PACU. Bedside nurses must be allowed to evaluate the need for vital sign assessment based on the needs of their individual patient rather than pre-determined frequency. Specific nursing research utilizing this theory was not found by this researcher.

Learned behavior can shape progress and outcomes, this theory proves the need for greater insight of policy and protocol in the healthcare environment. Nurses need the ability to perform their duties with the most current evidence-based data and protocols need to be shaped by that data. The literature reviewed revealed a need for more research into the effects of repetitive action and learned behavior, specifically within healthcare.

Figure 1. The theory of planned behavior.

Method

Purpose

The purpose of this study was to assess whether documentation of vital sign collection during the post-operative recovery room stay was collected based on evidence-based department policy or nursing custom.

Design

The design of the study was a retrospective chart review.

Sample

The sample included 50 charts from patients who underwent any surgical procedure requiring planned general anesthesia and were discharged home the same day. Charts from all male and female patients, 18 years and older, classified as ASA physical status category I or II (Appendix B) between January and May of 2017 were eligible for inclusion. The exclusion criteria consisted of patients who (a) were younger than 18 years old, (b) underwent unplanned general anesthesia, (c) developed post-surgical complications that required an inpatient admission, and/or (d) were outside of the $\pm 20\%$ of baseline vital sign on admission to the PACU. An admission was defined as an observation or hospital stay longer than 23 hours.

Site

The study site was the PACU at Newport Hospital, a Lifespan affiliate, 129-bed general medical and surgical hospital with current Magnet designation. In 2016, 4,503 outpatient surgeries were performed at this facility.

Procedure

Approval for the study was obtained from the Surgical Services Department manager and the Chief Nursing Officer at Newport Hospital (Appendix C). Approval was obtained from the Institutional Review Boards (IRB) of Lifespan Healthcare System (Appendix D) and Rhode Island College (RIC). With assistance from the Newport Hospital medical records department, the researcher reviewed medical records, retrospectively, from January 1st, 2017 to May 31st, 2017. The records were electronically filtered according to the specified sample population. Fifty charts were randomly selected and analyzed from the first randomized 100 records that met the inclusion criteria. Health Insurance Portability and Accountability Act (HIPAA) guidelines were maintained, and all data used in the study were free of patient identifiers. The information collected included the documented event times, starting with admission from the operating room and ending with discharge from PACU (Appendix E). Data regarding delays were noted and recorded on the data collection chart. Examples of delays included uncontrolled pain, nausea, and vomiting, and adverse events, such as cardiac or respiratory status changes. The data was collected manually, on paper, and stored in a locked area within the medical records department. Upon conclusion of the study, the paper documents collected for data were disposed of in the confidential material bin in the medical records department.

Measurement

Frequency of vital sign collection was recorded and categorized in 5-minute intervals on an Excel spreadsheet (Appendix E). An additional column was added to note circumstances requiring increased vital sign collection, such as sleep apnea, nausea, pain,

and bleeding. The number of vital signs documented and the interval of time between each documentation was measured. Specific vital sign values were not recorded.

Organizational/Systems Factors

The organizational factors that supported this study was the current Magnet facility designation. Magnet designation is awarded to hospitals that value and support nurse-driven research. No limiting forces occurred.

Ethical Concerns

There were no ethical concerns identified. The medical records reviewed were from patients who had been discharged. All federal, state, and institutional rules pertaining to patient confidentiality were followed. The charts reviewed were free of bias toward gender, ethnicity, and race. The data used in the study was securely destroyed after completion of the study.

Data Analysis

Data was measured utilizing Microsoft Excel. Patients were represented in rows. The frequency of documented vital signs in 5-minute increments, per patient, were stored in the columns. Collection of the frequency was then tallied by adding the number of times a vital sign was documented in each column. An additional column was used to annotate circumstances for delay of discharge. The collected data was analyzed and visually expressed using pie charts and bar charts.

Results

The total population of surgical records from January 1, 2017 through May 31, 2017 was 1,862. Of these, 734 records met the inclusion criteria for the study. The records were randomized and 50 were randomly selected create the sample. Thus, the sample represented 6.8% of the total number of qualifying records (Figure 2).

This retrospective review showed hospital policy on frequency of vital sign documentation was not followed in 18% of the 50 reviewed records ($n=9$; Figure 3). Specifically, charts meeting the inclusion criteria were expected to adhere strictly to the hospital policy regarding vital sign documentation at a minimum of 15-minute intervals. The nine non-compliant records revealed documentation of vital signs occurred at greater than 15-minute intervals for those patients. In two records (4%) the final vital signs were documented at the 15-minute point indicating an expectation for another vital sign to be documented at the 30-minute point, based on the policy minimum length of stay in the PACU. The data also showed vital sign documentation was most frequent within the first 15 minutes of the PACU stay, as illustrated in Figure 4. Since the expected prevalence of policy adherence was 100% of reviewed records, statistical analysis of the results was not possible or relevant.

Figure 2. Random selection process for qualifying records.

Figure 3. Adherence vs nonadherence to EBP policy for vital sign monitoring in PACU

Figure 4. Frequency of vital sign documentation per time interval.

Summary and Conclusions

This retrospective chart review indicates bedside nurses documenting vital signs in the post-anesthesia care unit did not follow policy in multiple cases. There is a number of possible explanations for this including misinterpretation or lack of awareness of policy, technology factors, human factors, or a combination of these. The monitors in the PACU bays were programmed to obtain vital signs in a default pattern once the patient was admitted from the operating room. Documentation of vital signs in the electronic medical record (EMR) followed the frequency of blood pressure measurements displayed on the monitor and were recorded by the bedside nurse. The nurse was permitted to adjust the frequency of blood pressure measurement as clinically indicated with a minimum frequency of every 15 minutes per policy.

The results showed a variety of patterns of blood pressure measurements were employed by the PACU nurses and included every five minutes, every 10 minutes, every 15 minutes, as well as other variations. The most frequent pattern of vital sign measurement was the default pattern: every five minutes for three measurements then every 10 minutes. While each of the previously mentioned patterns of vital sign measurement meets the hospital policy, the prevalence of non-compliance with the policy demonstrates the frequency of vital sign measurement or documentation was determined by the nurse in some cases. It is possible the nurse either independently determined when to obtain vital signs, the nurse documented the correctly measured vital signs at the incorrect time in the EMR, or the times on the monitors did not match the times on the EMR. Since the monitor and the EMR in this PACU were independent, it was impossible to determine which scenario occurred.

The frequency of vital sign measurement and documentation determines the data entry burden for the nurse. More frequent measurements increase the nurse's burden and may distract him or her from patient care activities. As integration of the EMR with patient monitoring devices spread to the PACU the need for the nurse to manually enter vital signs into the EMR will eventually disappear. The benefit of this will be that the frequency of vital sign measurement (specifically the blood pressure) can be set to as often as every one to two minutes if desired without burdening a nurse with more frequent data entry. This will allow the nurse to spend his or her valuable time attending to the patient and performing patient-centered activities. The nurse will have to choose a blood pressure measurement frequency that balances the clinical needs of the patient with the discomfort to the patient. As the patient remains or becomes more stable, the frequency can be lengthened appropriately. The risk of employing integrated patient monitor and EMR systems is that care providers may lose an important stimulus to remain engaged with the patient at the bedside. Appropriately programmed and calibrated alarm systems are one important mechanism for keeping providers appropriately attentive, however, it cannot be understated that the most important monitor employed in the PACU is a vigilant nurse.

Recommendations and Implications for Advanced Nursing Practice

This study revealed a pattern of vital sign collection that suggests bedside nurses followed a planned behavior and did not adjust to the patient's status. The theory of planned behavior can be useful in some cases, such as during a head to toe physical exam, or while performing other tasks in a systematic manner. The importance of adjusting to unpredictable outcomes is paramount for the bedside PACU nurse and all providers to achieve an optimal patient outcome. Advance Practice Nurses need to have an awareness of their own behaviors and promote evidence-based education.

Care of patients in the PACU should always be patient driven. Monitoring of vital signs is a critical element for guiding care in this environment. Policies are important in creating a framework for providers to follow and to maintain consistency of care from patient to patient and among providers. Unfortunately, policies do not always fit well with ever-evolving technology. Policies can also create a situation where they are followed as a matter of routine rather than as a guide to individualized patient care.

The advanced practice nurse should have a role in policy development to insure policies remain focused on patient-driven care and are supported by current technology. Advanced practice nurses should also serve as a clinical resource to the nursing care team by offering support of physical and data-driven clinical decision-making. By maintaining current knowledge of evidence-based advances in nursing and medical science, the advanced practice nurse can provide optimal patient outcomes.

Post-surgical care of a patient relies on complete assessment of the patient. It is during this time that vital sign monitoring is most important to identifying a potential decline of status. Based on this research, it is recommended that future nursing policies

allow the bedside nurse freedom to adjust assessments according to the patient's vital signs. Implementing such policies may improve nursing vigilance and decrease the burden of unnecessary data entry into the EMR. With additional research the APRN can explore implications of current policies and potential sources of delays of discharge from the PACU. Delays could possibly impact the cost and necessity of care.

References

- Allen, J., Russel, S., Baker, S., Donoghue, J., Godden, B., Hoefner, R., ... Lopez, J. (2014). *Perianesthesia nursing standards, practice recommendations and interpretive statements*. Cherry Hill, NJ: American Society of Perianesthesia Nurses.
- Ajzen, I., & Fishbein, M. (1975). *Belief, attitude, intention, and behavior. An introduction to theory and research*. Philippines: Addison-Wesley Publishing Co.
- American Society of Anesthesiologists. (n.d.).
<https://www.asahq.org/resources/clinicalinformation/asa-physical-status-classification-system>
- Anderson, J., Mokracek, M., & Lindy, C. (2009). A nursing quality program driven by evidence-based practice. *Nursing Clinics of North America*, 83–91.
<http://dx.doi.org/10.1016/j.cnur.2008.10.012>
- Burchill, C., Anderson, B., & O'Connor, P. (2015). Exploration of nurse practices and attitudes related to postoperative vital signs. *MedSurg Nursing*, 24(4), 249–255.
- Cardona-Morrell, M., Prgomet, M., Turner, R. M., Nicholson, K., Hillman, K. (2016). Effectiveness of continuous or intermittent vital signs monitoring in preventing adverse events on general wards: A systematic review and meta-analysis. *International Journal of Clinical Practice*, 70(10), 806–824.
<http://dx.doi.org/10.1111/ijcp.12846>

- Collins, S., Cato, K., Albers, D., Scott, K., Stetson, P., Bakken, S., & Vawdrey, D. (2013). Relationship between nursing documentation and patient's mortality. *American Journal of Critical Care*, 22(4), 306–312.
<http://dx.doi.org/10.4037/ajcc2013426>
- Haret, D., Kneeland, M., Ho, E., Block, F., & Helfman, S. (2012). 2012 Operating room design manual. Retrieved from asahq.org/resources/resources-from-asa-committees/operating-room-design-manual
- McGhee, T., Weaver, P., Solo, S., & Hobbs, M. (2016). Vital sign reassessment frequency recommendation. *Nursing Management*, 11–12.
<http://dx.doi.org/10.1097/01.NUMA.0000491132.98848.22>
- Miller, R., Eriksson, L., Wiener-Kronish, J., & Young, W. (2010). *Miller's Anesthesia* (7th ed.). Philadelphia, PA: Churchill Livingstone Elsevier.
- Newport Hospital. (2016). Admission to and ongoing care of the patient in the post anesthesia care unit [Policy and procedure manual]. Retrieved from remote.lifespan.org/policies/Newport/Perioperative%20services/PACU/danaInfo=intra.lifespan.org+PACU_103_admission-to-and-ongoing.pdf
- Newport Hospital. (2016). Discharge Criteria [Policy and procedure manual]. Retrieved from remote.lifespan.org/policies/Newport/Perioperative%20services/PACU/DanaInfo=intra.lifespan.org+PACU_143_discharge-criteria-07.16.pdf
- Philpin, S. (2002). Rituals and nursing: A critical commentary. *Journal of Advanced Nursing*, 38(2).

- Schulman, C., & Staul, L. (2010). Standards for frequency of measurement and documentation of vital signs and physical assessments. *Critical Care Nurse*, 30(3), 74–76.
- Tysinger, E. (2015). How vital are vital signs? A systematic review of vital sign compliance and accuracy in nursing. *Journal of Science and Medicine*, 1(1), 68–75.
- Zeitz, K. (2003). Nursing observations during the first 24 hours after a surgical procedure: What do we do? *Journal of Clinical Nursing*, 14, 334–343.
- Zeitz, K., & McCutcheon, H. (2002). Policies that drive the nursing practice of postoperative observations. *International Journal of Nursing Studies*, 39, 831–839.
- Zeitz, K., & McCutcheon, H. (2005). Tradition, rituals, and standards in a realm of evidence-based nursing care. *Contemporary Nurse*, 18(3), 300–308.
- Zeitz, K., & McCutcheon, H. (2006). Observations and vital signs: Ritual or vital for the monitoring of post-operative patients? *Applied Nursing Research*.
<https://doi.org/10.1016/j.apnr.2005.09.005>

Appendix A: St. Luke's Evidence-Based Practice Model

Appendix B: ASA Physical Status Classifications

ASA PS Classification	Definition	Examples, including, but not limited to:
ASA I	A normal healthy patient	Healthy, non-smoking, no or minimal alcohol use
ASA II	A patient with mild systemic disease	Mild diseases only without substantive functional limitations. Examples include (but not limited to): current smoker, social alcohol drinker, pregnancy, obesity ($30 < \text{BMI} < 40$), well-controlled DM/HTN, mild lung disease
ASA III	A patient with severe systemic disease	Substantive functional limitations; One or more moderate to severe diseases. Examples include (but not limited to): poorly controlled DM or HTN, COPD, morbid obesity ($\text{BMI} \geq 40$), active hepatitis, alcohol dependence or abuse, implanted pacemaker, moderate reduction of ejection fraction, ESRD undergoing regularly scheduled dialysis, premature infant PCA < 60 weeks, history (>3 months) of MI, CVA, TIA, or CAD/stents.
ASA IV	A patient with severe systemic disease that is a constant threat to life	Examples include (but not limited to): recent (<3 months) MI, CVA, TIA, or CAD/stents, ongoing cardiac ischemia or severe valve dysfunction, severe reduction of ejection fraction, sepsis, DIC, ARD or ESRD not undergoing regularly scheduled dialysis
ASA V	A moribund patient who is not expected to survive without the operation	Examples include (but not limited to): ruptured abdominal/thoracic aneurysm, massive trauma, intracranial bleed with mass effect, ischemic bowel in the face of significant cardiac pathology or multiple organ/system dysfunction
ASA VI	A declared brain-dead patient whose organs are being removed for donor purposes	
<p>*The addition of "E" denotes Emergency surgery: (An emergency is defined as existing when delay in treatment of the patient would lead to a significant increase in the threat to life or body part)</p>		

Appendix C: Newport Hospital Letter of Support

Newport Hospital
A Lifespan Partner

11 Friendship Street
Newport, RI 02840-2299
Tel 401 846-6400

October 20, 2017

To Whom it May Concern:

This is a letter of support for Jennifer Thran and the research to be done regarding vital sign documentation in the Post Anesthesia Care Unit. As she conducts her retrospective chart review, I understand she may find useful information to shape the nursing practice in the post-surgical environment. As the CNO of Newport Hospital, I look forward to her results and presentation. Please contact me with any questions or concerns of her project.

Sincerely,

Orla Brandos, DNP, MBA, MSN, RN, CPHQ, NEA-BC
Vice President, Patient Care Services
& Chief Nursing Officer
Newport Hospital
11 Friendship Street
Newport, RI 02824
Office: (401) 845-1530
Fax: (401) 845-1088

OB/CM

Appendix D: Lifespan IRB Approval

Research Protection Office
Office of Research Administration
CORO West, Suite 1.300
One Hoppin Street
Providence, RI 02903
Tel 401 444-6246, Fax 401 444-7960

E. P. Bradley Hospital
Rhode Island Hospital
The Miriam Hospital
Newport Hospital
Gateway Healthcare

DATE: March 26, 2018

TO: Kathleen Bergeron, MS, APRN, CNS-BC, CEN

FROM: Janice Muratori, MSN, FNP-BC
Director, Research Protection Office

SUBJECT: **HUMAN SUBJECTS PROTECTION of New Project AS PER EXPEDITED REVIEW**
FWA-Rhode Island Hospital (RIH) 00001230, The Miriam Hospital (TMH) 00003538
IRB Registration #: RIH IRB 1 - 00000396, RIH IRB 2 - 00004624, TMH IRB - 00000482

CMTT/PROJ: 219517 45CFR 46.110(5)

TITLE: [1175821-1 and 1175821-3] Documentation of Vital Signs During the Post Anesthesia Phase of Care

Your research project was reviewed and approved on March 5, 2018. Requested IRB revisions were received and accepted on March 21, 2018. This research has been approved as meeting the expedited criteria for the protection of humans per 45 CFR 46.110(5) by the Lifespan - The Miriam Hospital IRB. This institution is in compliance with the ICH GCP as they correspond to the FDA/DHHS regulations. This review and approval are applicable for Newport Hospital.

The following items are approved in this submission:

- Application Form - Bergeron Application Chart ReviewPart II Filled.pdf (UPDATED: 01/18/2018)
- CV/Resume - Resume KB 2017.docx (UPDATED: 12/27/2017)
- Data Collection - Data collection with variables (UPDATED: 01/11/2018)
- HIPAA Consent/Authorization - HIPAAPrepToResearch1-18-18.pdf (UPDATED: 01/18/2018)
- HIPAA Waiver - Bergeron HIPAA Waiver Of Authorization (3).pdf (UPDATED: 03/19/2018)
- Lifespan - Research Application Part 1- Human Subject Studies - Lifespan - Research Application Part 1- Human Subject Studies (UPDATED: 03/21/2018)
- Proposal - proposal date clean.docx (UPDATED: 03/21/2018)
- Proposal - proposal date change.docx (UPDATED: 03/21/2018)

This notification CONSTITUTES AUTHORITY FOR ACTIVATION of this application.

Appendix E: Vital Sign Collection Spreadsheet

[illegible]