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# Associations between Nurse Experience, Clinical Specialty Setting, and Level of Nursing Education with Adherence to Clinical Practice Guidelines for Inpatient Influenza and Pneumococcal Vaccination Administration

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Associations between Nurse Experience, Clinical Specialty Setting, and Level of Nursing  
Education with Adherence to Clinical Practice Guidelines for Inpatient Influenza and  
Pneumococcal Vaccination Administration

Presented to the Faculty of the School of Nursing

The George Washington University

In partial fulfillment of the requirements for the degree of

Doctor of Nursing Practice

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Spring 2018

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Abstract

**Background:** This research project examines associations between years of nursing practice and compliance with clinical practice guidelines for inpatient influenza/pneumococcal vaccination administration. Previous research demonstrates novice nurses are at higher risk for errors of omission and face challenges with critical thinking.

**Objectives:** 1) Identify associations between years of practice and compliance with clinical practice guidelines for inpatient influenza/pneumococcal vaccination administration and 2) to identify associations among independent variables including levels of education, and specialty setting.

**Methods:** A retrospective chart review was conducted to identify associations between years of practice and compliance with clinical practice guidelines for inpatient influenza/pneumococcal vaccination administration. Aggregate data were obtained from the quality improvement coordinator of a 37 bed inpatient community hospital. A **chi**-squared analysis was used to identify the relationship between variables.

**Results:** There were sixty-three Registered Nurses in this study with a compliance rate of 81.64%. We accepted the three null hypotheses. Nurse experience  $X^2(1, N=50) = 0.836$ ,  $p=0.361$ , specialty setting  $X^2(1, N=50) = 0.836$ ,  $p=0.361$ , level of education (ADN=35.30%, BSN and above = 44.40%  $X^2(1, N=44) = 0.863$ ,  $p=0.36$ . Proficient/Expert=47.10%), specialty setting (Med-Surg= 39.40%, ICU=52.90%), level of education (ADN=35.30%, >BSN = 44.40%).

**Conclusion:** This project will serve as a basis for future quality improvement projects to improve compliance with vaccination administration. A significant finding was compliance among these groups being < 50% (compliance was defined at >90%). Overall compliance with nurse experience 45.20% (Novice = 42.90%, Competent =45.50%, No statistically significant associations were found between compliance based on nurse experience, clinical specialty setting, and education level.

## **Background**

The American Association of Critical Care Nurses (AACN, 2018) sites a critical nursing shortage and anticipates over 1 million Registered Nurse vacancies by 2024 (p.20). AACN (2018) attributes an aging population and a mature nursing workforce as the main factor. Other contributing factors include insufficient nursing faculty and nursing school program capacity limitations (p.20). In 2008, the American Association of Colleges of Nursing estimated that nursing schools would need to graduate 30,000 nurses annually to accommodate the growing shortage (AACN, 2008). Hospitals have been forced to ramp up recruitment strategies to focus on an accelerated transition from new graduate to registered nurse (Ebright, 2004). Staffing and budgetary concerns have challenged hospitals to find ways to accelerate the development of critical thinking in new graduates while achieving quality and safety goals (Flanders, 2017).

Ebright (2004) identifies novice nurses at a higher risk for errors in an acute care environment due to factors such as an unpredictable workload, unclear expectations, and ability to make decisions. Staffing shortages, being overworked, and reliance on ancillary team members to assist in care delivery inhibit the development of nursing intuition (Ebright, 2004). A novice is defined by Benner as “no experience with situations in which they are asked to perform tasks” (1982, p.402). It is important to note that novices are not just new graduates, but also include nurses that are new to a specialty or a unit. In the time period after orientation, novices are at a high risk for making errors or being involved in sentinel events due to an increased focus on task completion, inability to re-prioritize quickly and lack of expert intuition (Benner, 1982). In the landmark report, *To Err is Human* published by the Institute of Medicine

(IOM) in 2000, estimates that more than 98,000 people die every year due to medical errors while in the hospital (IOM, 2000).

This facility orients their nurses one on one with a preceptor. The length of the orientation is customized to meet the needs of that individual. Typically, a medical-surgical nurse receives 3-6 weeks of orientation and an intensive care unit (ICU) nurse receives approximately 6 weeks. This allows new nurses an opportunity to ask questions, sharpen their nursing assessment and critical thinking skills. They become acquainted with the resources, are taught how to access expert clinicians, and to navigate policies and procedures. Once the orientation is complete, they practice independently as a novice nurse at the bedside. At this time there is not a nurse residency in place at this organization.

### **Problem Statement**

Literature supports the organization's perception that novice nurses are at a higher risk for errors, including errors of omission (Elbright, 2004). These nurses are not only new graduates but includes nurses with less than one year of experience in a current practice environment (Benner, 1982).

### **Purpose**

The purpose of this study is to examine correlations between compliance with clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration measures with nurse experience, clinical specialty setting, and level of nursing education. This project will determine if a practice change is indicated to support novice nurses through their transition to practice to increase compliance with clinical practice guidelines.

### **Specific Aims**

The aim of this study is three-fold: to determine if there is an association between the inpatient quality measures for immunization (IMM) specifically the inpatient quality measures for influenza and pneumococcal vaccination compliance and nurse years of experience, educational preparation, and clinical setting.

1. To identify associations between years of practice and compliance with clinical practice guidelines.
2. To further identify associations among independent variables including levels of education, and length of orientation.

### **Hypothesis**

1. If Nurses are classified as a novice with less than two years of experience then they will adhere to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration less than those with >2 years of nursing experience.
2. If nurses work in a specialty setting (ICU) then they will have greater adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration
3. If nurses hold a Bachelor's Degree in Nursing or above then they will have a greater adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration.

### **Research Questions**

1. Is there a correlation between years of practice experience and adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration?

2. Is there a correlation between nurses clinical practice settings (ICU versus Med-Surg) and adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration?
3. How does the level of nursing education effect adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration?

### **Significance**

Thompson (2010) reported every year 1 in 5 people in the United States contracts influenza. Annually, an estimated 226,000 people in the United States are hospitalized from complications related to influenza and between 3,000-49, 000 people die from influenza complications. In 2015 the National Vital Statistics reported that influenza and pneumonia combined were in the top ten leading cause of death in the US (Heron, 2017).

Due to the impact influenza and pneumonia have on our population, in 2006, the National Quality Forum (NQF) worked to create vaccination guidelines that applied to all patients. In 2007 the NQF partnered with the Centers for Medicare & Medicaid Services (CMS) to create the three IMM-1 guidelines for pneumonia immunization (IMM-1a– Overall rate, IMM-1b – Age 65 and Older, and IMM-1c – High Risk Populations (Age 6 through 64 years) and the IMM-2 for Influenza immunization (TJC, 2018).

This study addressed the associations between nurse experience, clinical specialty setting, and level of nursing education with adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration. It also offers recommendations on how to best support novice nurses as they transition from novice to expert to prevent errors of omission. Nurses are challenged to improve efficiency while achieving patient outcomes.

Novice nurses are traditionally deliberate with their pace and task-oriented, looking for guidance from policies and procedures on how to intervene or to guide prioritization (Benner, 1982). As patient acuity increases and length of stay decreases, novice nurses are often challenged to achieve efficiency and outcome metrics, which stratifies them at a higher risk for errors and omissions of care (Ebright, 2004).

### **Literature Review**

This literature review covers articles that will define nursing levels of proficiency, offer recommendations on effectively transitioning through those levels, and identify opportunities to improve adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration. The literature review was conducted using CINAHL, Medline and Ovid using the terms novice to expert, novice nurses, patient safety and novice nurses, and error prevention and novice nurses. To further refine the search the term mentor was added. The search results yielded a large number of studies that were published greater than 10 years ago. All articles over ten years were omitted except Benner's Novice to Expert (1982) and Andrews Mentorship in nursing: a literature review (1998) which both had significant process and outcomes to contribute to the project. The literature review begins with Benner's definitions of the five levels of nursing proficiency followed by Lynham's work around Benner's fifth stage of practice development to discuss the holistic application of a nursing intuition, reflection, and trust by the expert nurse. This was followed by literature reviews focusing on mentorship and the mentor/mentee relationship and variations in novice to expert's responses to work complexity. This literature review does not include opinion papers.

Lyneham (2009) builds on Benner's Novice to Expert by further examining the final expert level and methods to translate expert intuition into all levels of proficiency. This study presents the benefits of reflection through team debriefing and exploring the reactions of experienced nurses to patient events by soliciting reflection from the experienced nurse. This study discussed the unconscious connection between intuition and the importance of trust and reflection on the outcomes of the situation, discussing opportunities to improve.

Recommendations were set forth to "increase relevant practical experience and support of nursing schools" (Lyneham, p. 2483, 2009). Experience over time offers a nurse the ability to transition from novice to expert and move from "two-dimensional linear thinking into a fluid practice state of trusting their intuition" (Lyneham, p. 2484, 2009). This study discusses the benefits of transference of intuition from the expert nurse to the novice nurse. Expert nurses reflections offer novice nurses an opportunity to learn from the expert's experiences, ask questions and have an understanding of the critical thinking that led to that decision. This study discussed opportunities to improve future practice and will be discussed further in the recommendations from this project.

The second theme is mentorship and the mentor/mentee relationship. Andrews (1999) focuses on the selection and training of mentors and creating a consistent approach to their preparation. This mentorship extends beyond working one on one with the mentor and Andrews focuses on the importance of a relationship to sustain the benefit. This article is a review of earlier works. Based on previous findings sites specific mentor traits and key phases of the mentor and mentee relationship. Mentor characteristics included "approachability, effective interpersonal skills, adopting a positive teaching role, paying appropriate attention to learning,

providing supervisory support, and offering professional development opportunities."(Andrews, 1999, p. 204). This article discussed the connection between the mentor and mentee as well as personally connecting by matching novices with mentors that have similar backgrounds similar background or with a mentor that has recently completed the orientation process (Andrews, 1999, p.205). Currently, this organization does not subscribe to a formal nurse residency program which helps to foster these relationships. Recommendations from this article included fostering strong mentor, mentee relationships to improve communication, teamwork and vaccination administration.

The third theme is variations in novice to expert's responses to work complexity. A comparison of patient care units with high versus low levels of missed nursing care by Beatrice Kalisch, Kate Gosselin, Seung Hee Choi. This study consisted of focus groups conducted on five units with the most missing nursing care and five units with the least amount of missed nursing care. Identified themes to included, "staffing levels, communication, collective orientation, back up, monitoring, leadership, long tenure, unit size, trust and accountability" (Kalisch, p. 320, 2012). This study is relevant to the current project to discuss themes and recommendations for supporting novice nurses to prevent errors and improve patient safety. This study specifically looked at the error of omission or significant delay in nursing tasks. This is most prevalent in novice nurses due to rapidly changing priorities. Recommendations included improved communication, improving teamwork through huddles, and promoting trust amongst team members. The charge nurse was identified as a pivotal influence of the novice nurse and error prevention (Kalisch, 2012). The findings demonstrated that charge nurses that were approachable and having minimal or no patient assignments where are more accessible,

were most beneficial to supporting the novice nurse during the post orientation phase to prevent errors. Kalisch (2102) recommended consistent charge personnel and providing them with formal leadership training to best support them in their role. Trust has presented as a recurrent theme amongst all articles especially being able to trust that your team “has your back” and will complete delegated tasks in a timely manner.

This study is a quantitative study examined a sample size of twenty-three RNs on cardiac telemetry units at five hospitals. Burger (2010) cited four central themes that emerged from this study which included cognitive strategies, communication, integration of roles, and response to the work environment. The work in this study is relative to the current project as it examines the efficacy in which the novice, advanced beginner, competent and expert nurse prioritize and re-prioritize tasks throughout the day to administer safe patient care. There are many complexities to healthcare and patients’ needs and priorities are change rapidly and continually. How nurses respond to this change in priorities can greatly impact adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration. Burger (2010) sites interruptions, and hunting and gathering for needed supplies as two of the greatest disruptors of a novice nurse’s day. The workflow of the novice nurses could be described as liner or task oriented and they were often not able to recover from major patient challenges and interruptions. Competent and expert nurses were able to reprioritize more effectively and efficiently with minimal disruption to their day. Communication and delegation were two central themes that identified major practice gaps between the novice and expert nurses. Novice nurses typically communicate on a “need to know” basis and keep delegation to a minimum where the competent and expert nurses communicated on a constant basis with all disciplines and were able to

delegate with ease. Beginners were noted to be taking a more task-oriented approach, and were often not equipped with communication skills to address customer service concerns. In contrast, the expert nurse worked in a more holistic manner, taking into account the patient's preferences, spiritual, social, and health needs (Burger, 2010, p. 506). Burger noted disparities in preparation and the effective use of organizational aids. Expert nurses took more time to adequately prepare and organize their day, often coming in early to gather the necessary information and they were able to utilize organizational tools more effectively.

In conclusion, the literature reviewed demonstrated three common themes around supporting novice nurses to prevent errors. These themes included the progression from novice to expert, the mentor and mentee relationship, and the variations in novice to expert's responses to work complexity. All articles reviewed had a common thread stating the need for trust, teamwork, and communication and supporting resources. Each of the articles examined a different aspect of novice nurse and addressed how to best support them to improve adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration. This demonstrates the need to have right people in supporting roles as charge nurses and mentors that are approachable, positive, and supportive and are skilled in providing constructive feedback to promote professional development.

A subsequent review of the literature provided additional recommendations to promote successful relationships between the preceptor and the novice nurse and provide a proactive approach to preventing patient safety events. Forneris (2007) described three stages of the novice nurses' development as a critical thinker. The novice experienced initial anxiety, followed by a period of questioning before breaking through as a critical thinker. Froneris

(2007) conducted interviews with learner/preceptor dyads and recommended a method of reflective journaling referred to as contextual learning to expedite the development of critical and intentional thinking.

Harris (2014) conducted focus groups, which revealed inconsistencies in preceptor training, nursing practice and interpretation of policies. It was noted that preceptor guidance was typically based on practical knowledge and not founded in formal education. Preceptors often lacked the knowledge to proactively prevent errors and many organizations did not offer ongoing preceptor development program and they lacked standardized curriculums (Harris, 2014). An online education module was introduced to the preceptors and a paired t-Test demonstrated pre- and posttest scoring of the online modules and identified a subset of questions commonly missed by study participants. These questions were focused on medication errors and showed a pattern with practice guidelines, critical thinking and clinical practice. There was a 7.5 point increase in the scores after completion of the online module. Harris (2014) emphasizes the need to focus on preceptor development and education to recognize and prevent errors through standardized and on-going education (Harris, 2014).

Ebright's (2004) work was outside of the ten-year period, however, offered some valuable insight to factors that drive a novice nurse to become involved in errors. These included general themes such as the peer pressure felt when preparing for a shift change, pressure from time constraints, the stress of a first-time event, disruptions, losing sight of the big picture, and novices assisting other novices. Ebright (2004) cites how novices often struggled to understand how something such as a negatively trending abnormal lab value was an early sign of deterioration. Ebright (2004) noted that when a novice would ask an experienced colleague

about a lab value, the unsolicited conversation that ensued around what would cause that value to be abnormal, sign and symptom to look for and potential early interventions was more helpful than just the answer to the question. Ebright (2004) emphasized focusing on known gaps and having back up plans to ensure knowledge and resources are available to support novices nurse in safe practice.

### **Theoretical Framework**

Benner's Novice to Expert is a seminal work that provides the framework and theoretical foundation for this project. Nurses make the progression from novice to expert throughout their career. For some, this may happen multiple times if they change specialties or practice settings. Application of Benner's model and the findings of this project have widespread implications to improve patient outcomes and decrease novice involvement in sentinel events. Benner's work is relative to this project as it provides standardized definitions for the various levels of proficiency.

Benner (1982) classifies nurses according to skill and levels of proficiency. She identifies the five levels as novice, advanced beginner, competent, proficient, and expert (p. 402). There is no specified time someone stays in a level of proficiency, it is based on comprehension and application of nursing concepts and the ability to prioritize and reprioritize. As nurses' progress from novice to expert, Benner (1982) suggests effective transitions from task orientation to a holistic, patient centric approach. The following levels of proficiency and their definitions will be used throughout the entirety of this paper. Benner (1982) defines novices as those having "no experience with situations in which they are asked to perform tasks" (Benner, p.402, 1982). At this level, the beginner is task oriented and depends on rules to prioritize tasks.

When there is a change in patient condition or needs, or a need to reprioritize rapidly, this is often stressful and disruptive to the novice's day.

The next level is the advanced beginner who has “demonstrated marginally acceptable performance” and they have often coped with enough situations in order to recognize patterns and their meanings (Benner, 1982, p. 403).

The third level is the competent nurse who “begins to see his or her actions in terms of long-term goals or overall plan and begins to distinguish between relevant and irrelevant attributes” (Benner, 1982, p. 404). A nurse at this level of proficiency is able to better apply these concepts and learning experiences however they lack speed and flexibility of the proficient nurse (Benner, 1982, p.405).

The fourth level is proficient. Benner (1982) suggests this level can “discern situations as wholes rather than single pieces and uses past experiences rather than rules to guide their practice” (p.405). Benner (1982) recommends the use of case studies when teaching proficient performers to optimize their learning (p. 405).

In the final stage, Benner (1982) defines the expert practice as a more holistic approach rather than previous task orientation and uses intuition to rapidly assess and adjust treatment plans (p.405). These nurses are viewed as experts in their specialty and Benner expresses frustration in not being able to accurately capture and replicate the intuition piece of the expert's practice. Experts are able to make rapid changes in prioritization with little disruption to their day. Appendix A, Diagram 1 demonstrates the application of Benner's model with knowledge and experience transference across the Novice to Expert continuum. The arrow in the diagram below demonstrates the transitions nurses make through Benner's five levels from Novice to

Expert. The center is represented by foundational traits that are present in a successful culture that nurtures talent. The outer ring represents actions that permit transference of knowledge and experiences amongst the levels and aid the novice in the progression to expert. The novice Nurses learn through exploration, imitation and observation of competent, proficient and expert peers. Novices lack experiences that they can use as a foundation for their knowledge. Expert clinicians can provide valuable learning opportunities to all levels of nurses by providing constructive feedback, modeling expert skills, application of critical thinking principles and reflecting on situations at hand to offer hints or valuable hindsight for future situations. Benner's theoretical framework links to the project hypothesis, if nurses are classified as a novice with less than two years of experience then they will adhere to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration less than those with >2 years of nursing experience.

### **Variables**

This project examined the association of nurse experience, clinical specialty setting, and level of nursing education with adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration. These variables are also listed in Appendices C and D on patient outcomes and safety event severity. The independent variables selected were evidence based opportunities to improve discussed within the literature review. Years of experience and practice setting where the event occurred are the two dependent variables that were also examined. When applying Benner's theory of Novice to Expert, it is important to identify where the nurse is on the novice to expert continuum. For this piece of data, we collected human resources demographics data to include date of hire. We examined the impact

of these independent variables on the dependent variables including the type and severity of error that occurred.

## **Methods**

### **Design**

This study was a retrospective chart review using routine, chart audit data. The rationale for a quantitative, retrospective design is that the organization currently collects monthly chart data, which identifies opportunities for quality improvement. This study will provide useful insight for future quality improvement projects to determine ways to efficiently and effectively transfer knowledge and experiences from expert to novice nurses to prevent errors during their first year of practice. The study was non-experimental and examined associations with adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration. This was a retrospective study. Data were reviewed to examine the relationships between the independent variables, education, setting and experience on the dependent variable (adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration).

### **Sample**

All patients are screened upon inpatient hospital admission based on the IMM-2 Influenza Immunization Measure. These criteria include all hospitalized inpatients over the age of six months. Patients are screened for influenza status and are vaccinated prior to discharge if indicated (TJC, 2018). This metric measures the screening and administration of the vaccination and includes patients that are screened and found to have a documented contraindication, have

declined the vaccination, or have received the vaccination during the current influenza vaccination season (TJC, 2018). Exclusion criteria includes patients under the age of six months, and outpatients.

A convenience sample was used in this study to evaluate nursing staff. Inclusion criteria included all nurses working at Fort Washington Medical Center on Medical-Surgical and in Critical Care (ICU/CCU) Units. Exclusion criteria included emergency room nurses and nurses that resigned or were terminated before July 29, 2017. This study sample was limited to the period of July 29, 2017 to November 29, 2017. The current data collection process started at this organization in July with the changing of the quality data manager. The data were received in aggregate therefore it includes nurses that may be on orientation. All nurses employed including agency nurses were included in the data. However, data on educational levels was not consistently available on the agency nurses. Nurses are typically on-boarded at this organization beginning with general hospital orientation for one week. During this time, they complete computer training and nursing competency based orientation. The nurses also have a day scheduled to complete a scavenger hunt to become acquainted with the unit, equipment and resources. Orientation is based on the individual needs and specialty setting. Orientation to the Medical-Surgical unit is typically 3-6 weeks. This is based on their years of nursing experience. Additional time can be offered based on the individual needs. The ICU/CCU nurse typically orients one on one with a preceptor for 6 weeks based on previous experience. The preceptor, orientee and unit leadership meet to determine if attritional orient time and opportunities are needed for the orientee to be successful in their position. The organization attempts to provide consistency in the assignment of a primary preceptor, however this can have some variation

when accommodating scheduling requests or unplanned absences. Efforts are made with the schedule to minimize the numbers of preceptors. The average orientee has 1-2 preceptors. During competency-based orientation the orientee is introduced to the influenza and pneumonia vaccination expectations. Currently the organization does not participate in a nurse residency program but is seeking to incorporate this to their program.

A convenience sample was used in this study. Inclusion criteria included 63 nurses working at Fort Washington Medical Center on Medical-Surgical and in Critical Care (ICU/CCU) Units. Exclusion criteria included emergency room nurses and nurses that resigned or were terminated before July 29, 2017. This study sample was limited to the period of July 29, 2017 to November 29, 2017. Overall there were sixty-three nurses, forty-five were employed by the organization, thirteen were agency nurses and five resigned before or during the sample period. Of this group there were seventeen nurses with Associates Degrees, twenty-six Bachelor's Degree, one Master's prepared nurse, and one with no education specified. There was no educational data available on the thirteen agency nurses and the five that resigned. During this time period there were 1025 data points. Each representing an opportunity to administer influenza and pneumococcal vaccination per the IMM-2 vaccination administration guidelines.

### **Recruitment**

The study was retrospective examination of data, which was collected from retrospective chart audits, and is based on adherence to clinical practice guidelines. The data were de-identified and had no patient names linked to the database. Data were collected from all patient charts over the age of 6 months. These patients were screened for influenza status and are

vaccinated prior to discharge if indicated (TJC, 2018). This metric measures the screening and administration of the vaccination and includes patients that are screened and found to have a documented contraindication, have declined the vaccination, or have received the vaccination during the current influenza vaccination season (TJC, 2018).

### **Setting**

This organization is a 37 bed community hospital in Maryland offering a variety of comprehensive medical and surgical services. The hospital treats over 43, 000 patients through their emergency room, and performs over 2,000 surgeries annually. The organization has the Joint Commission Seal of Approval. They have a four bed Critical Care Unit and a thirty-three bed medical surgical unit. They employ over 400 members of the medical team that serve the community with compassion and skill (FWMC, 2017). At this organization in the Medical/Surgical unit the Charge Nurses occasionally takes a patient assignment ranging from one patient to a full load of six patients based on staffing needs and patient acuity. The Intensive Care Unit is a four bed critical care unit. The unit is typically staffed with two nurses, one is the charge nurse who takes a full patient assignment of 2 patients. The nurses can print a profile sheet from the computer to help them to manage their assignment but there is no standardized organizational tool in use.

### **Instrumentation/Measurements**

#### **Data Collection Procedure**

Data were collected by routine monthly retrospective chart audits completed by the organization for inpatient influenza and pneumococcal vaccination administration. This data is maintained by quality improvement coordinator for the organization in an excel spreadsheet.

The data collection tool in Appendix B served as a guide for data and examined and guided the collection of data by the organization from the human resources databases. The tool examined what type of error, lack of documentation, initiation of task but incomplete, or omission of task. Human Resources data included months of experience in practice environment where event occurred, level of education (associates, bachelors, masters, or doctoral and clinical specialty setting ICU/CCU or non-specialty (med-surg). The tool sought to examine resources, including charge nurse assignments and if there were organizational tools available (ie: kardex or report sheets).

### **Data Analysis**

Retrospective data were collected on the items listed in the data analysis table in the Appendix D. Chi squared tests were performed in SPSS to examine associations between nurse experience, clinical specialty setting, and level of nursing education with adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration. The specialty area was defined as Critical Care (Intensive Care/ Cardiac Care Unit). Based on an extensive literature search, resources available to the novice nurse played an important role. The primary resources novice nurses identified were a charge nurse without a patient assignment and use of an organizational tool similar to a Kardex or a report sheet for organization.

### **Data Collection**

The data collection process included a retrospective chart review. The data were collected from an electronic database using Fort Washington's data collection spread sheet with additional demographic data collected from Human Resources Databases using the guidance from the data collection tool in the Appendix B. Those that assisted in data collection were employees of Fort

Washington Medical Center and were trained by the investigator, one on one, on data abstraction to ensure the highest level of inter-rater reliability. The data were collected by a Registered Nurse and a member of the Quality, Risk and Safety Department. This was a retrospective review of chart audits for adherence to clinical practice guidelines, specifically the administration influenza and pneumococcal vaccinations eliminating concerns of subject attrition. Data were collected and stored electronically by staff of the Fort Washington Medical Center and provided in aggregate in a de-identified format. A password protected laptop was used for storage of de-identified data. Electronic data were stored in accordance with the organizational policy. The files were password protected and had limited user access. A GANTT chart (located in Appendix E) has been created to provide a timeline for the study.

### **Data Analysis Plan**

Data were collected via routine chart audits at the organization. The data were de-identified and received in aggregate. These chart audits specifically addressed adherence to clinical practice guidelines around influenza and pneumococcal administration guidelines. Inter-rater reliability was calculated using Cohen's online kappa calculator. A pilot test was performed to determine the feasibility of data abstraction, appropriateness of inclusion and exclusion criteria and data frequency and availability. The pilot test included a randomly selected 10% sample size.

The hypotheses of this project examined associations between nurse experience, clinical specialty setting, and level of nursing education with adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration. If nurses are classified as a novice with less than two years of experience then they will adhere to clinical practice guidelines

for inpatient influenza and pneumococcal vaccination administration less than those with >2 years of nursing experience. If nurses work in a specialty setting (ICU) then they will have greater adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration and if nurses hold a Bachelor's Degree in Nursing or above then they will have a greater adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration. Data analysis focused on the years of experience in their practice setting, the level of practice level on the Benner's Novice to Expert Continuum, setting and levels of nursing education.

### **Ethical Considerations**

Provisions were made to protect the privacy and confidentiality of all subjects. All data were de-identified. This study adhered to the health insurance portability and accountability act of 1996 (HIPPA). The GW Institutional Review Board (IRB) reviewed and approved this study, the organization did not have a specific IRB and honored the GW IRB review.

A breach in confidentiality was the primary risk associated with a retrospective chart review research. There was a plan in place to mitigate this risk by destroying identifiers at the earliest opportunity and ensuring no disclosures of information for other purposes. The benefits of this project will not directly impact the people involved; however, it will provide valuable information for prevention of future patient safety events and assist in the on-boarding of new nurses.

### **Results**

There were sixty-three Registered Nurses in this study with a compliance rate of 81.64%. There were forty-five nurses employed by the organization, 13 agency nurses and 5 resigned

during the data collection period. Descriptive statistics were used to demonstrate an overall compliance with this clinical practice guideline ( $M=81.64\%$ ,  $SD = 20.39$ ). The mean tenure for nurses at the organization was 7.2 years. The educational analysis of the nurses is as follows: 1 Masters of Science in Nursing (MSN), 26 Bachelors of Science in Nursing (BSN), and 17 with Associates Degrees in Nursing (ADN). To perform chi square testing, we categorized them into two groups ADNs and BSN and above due a sample size of less than 5 for MSNs. Complete data were not provided on agency or those that resigned.

To evaluate the first research question for study, we examined the level of nursing experience and adherence to clinical practice guidelines. The nurses were stratified into 3 categories based on Benner's Novice to Expert Theory. The Novice/Advanced Beginner category included Novices Nurses with less than one year of nursing experience and the Advanced Beginner Nurses had greater than 1 year but less than 2 years of nursing experience at FWMC. The Competent category included Nurses with greater than 2 years, but less than 5 years of nursing experience. The Proficient/Expert Category included Proficient Nurses with greater than 5 years of nursing experience and less than 10 years and included Expert Nurses with greater than 10 years of nursing experience at FWMC. These categories of nurses were evaluated as being compliant or non-complaint with clinical practice guidelines. Compliance was based on completed patient screening, documentation and administration when appropriate. Compliance was defined as being greater than 90% and non-compliant is defined as less than 90%. The number of Novice/Advanced Beginner Nurses ( $n=14$ ) was compared to the number of Competent Nurses ( $n=11$ ) and Proficient/Expert Nurses ( $n=17$ ). The data were analyzed using a

chi square test. The relationship between the variables was not significant and the null hypothesis was accepted,  $X^2(2, N=42) = 0.55$ ,  $p = 0.973$  (Appendix F, Table A).

To evaluate the second research question for this study, we performed a chi square test to evaluate the correlation between specialty practice setting and clinical practice guidelines. We analyzed the data provided on 50 nurses to determine if there was between the level of compliance to clinical practice guidelines between nurses working in a Medical-Surgical area ( $n=33$ ) and those nurses working in a critical care area (ICU/CCU) ( $n=17$ ). We studied 63 Registered Nurses in this study with an overall influenza/pneumonia vaccination compliance rate of 81.64%. We accepted the three null hypotheses because there were no statistically significant differences between the variables in adherence to clinical practice guidelines based on specialty setting,  $X^2(1, N=50) = 0.836$ ,  $p = 0.361$  (Appendix G, Table B).

To evaluate the third research question for study, we performed a chi square test to evaluate the difference between compliance with clinical practice guidelines and levels of nursing education. We sampled 44 Registered Nurses and evaluated whether there was a difference between the number of nurses with an Associate Degree in Nursing (ADN) ( $n=17$ ) and Nurses with a Bachelor Degree in Nursing (BSN) or above ( $n=27$ ). These categories of nurses were evaluated as being compliant or non-compliant with clinical practice guidelines with compliant defined as greater than 90% and non-compliant being less than 90%. Analysis demonstrated no statistically significant difference between the variables therefore the null hypothesis was accepted,  $X^2(1, N=44) = 0.863$ ,  $p = 0.361$  (Appendix H, Table C).

A significant finding was the rate of compliance among these groups being < 50% (compliance was defined at >90%). Overall compliance by nurse experience 45.20% (Novice =

42.90%, Competent =45.50%, No statistically significant differences were found between compliance based on nurse experience, clinical specialty setting, and education level.

## **Discussion**

### **Study Limitations**

This study had a number of limitations. Data were received in aggregate from the organization. The organization did provide data on the education level or the years of nursing experience on agency nurses. Data were limited due to the collection methods used at the organization. A new quality coordinator began more robust data collection and tracking starting in July 2017, prior to this time much of the data were collected and collated manually instead of using an electronic database or occurrence reporting system. This limited the amount of data collected. The sample size of nurses was small ( $n=63$ ) and was only representative of one organization which created limitations. There was only one Masters prepared nurse, so that nurse was grouped with nurses with a Bachelor's degree or higher. The small sample size also created limitations when examining levels of nursing experience. We needed to group the nurses as follows: Novice (< 1 Year in practice setting)/ Advanced Beginner (>1 Year < 2Years), Competent (2- 5Years in practice setting), Proficient (5-10 Years in Practice Setting)/Expert (>10Years in Practice setting).

### **Discussion of Results**

The purpose of the three research questions for this project was to identify associations between nurse experience, clinical specialty setting, and level of nursing education with adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration. This study rejected these null hypotheses. The relationship between the

variables was found to be insignificant. This project does not support the perception that novice nurses are less compliant with adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration. This study did have a notable finding. The overall compliance rate was 81.64% with only 12% of the overall nurses achieving compliance (>90%). The rate of compliance among these groups being < 50% (Overall compliance by nurse experience 45.20% (Novice = 42.90%, Competent =45.50%).

This study also demonstrates that non-compliance with clinical practice guidelines encompasses all levels of education, clinical practice setting and years of experience, including expert nurses. Colón-Emeric (2007) identified some common barriers to compliance among all levels of nurses including experts with clinical practice guidelines which included insufficient resources, communication, conflicting or overwhelming policies. Other contributing factors to non-compliance among expert levels nurses included competing priorities, burdensome documentation and reliance on nursing intuition from personal experience.

Maryland Health Care Quality Reports (2018), gives this organization an overall two star rating and a rating of average on influenza and pneumococcal metrics. This rating is based on a three point Likert scale offering ratings of above average, average and below average.

This study demonstrates the importance of providing education, reinforcement and accountability measures with all groups. Benner's Novice to Expert Theoretical framework is relevant because it focuses on supporting growth and development of nurses across the continuum by fostering communication, trust and teamwork. While we grouped these nurses into categories of Novice, Proficient and Expert, there are some instances where someone fails to progress on the novice to expert continuum.

### **Implications and Conclusion**

This project will serve as a basis for future quality improvement projects to improve future compliance with vaccination administration. As leaders we need to be proactive and engage staff in owning their clinical practice at all levels and helping them to see how the work that they do every day has an impact patient's health and safety. Leaders have an opportunity to frame policy recommendations in a way that helps bedside nurses to understand the importance of their work. In this case, placing emphasis on something as simple as administration of an influenza and pneumococcal vaccinations can save the lives of the 3,000 to 49,000 people annually that die from the flu/pneumonia.

Based on a review of literature, we will offer three recommendations to help with adherence to include promoting transference of intuition from the expert nurse to the novice nurse would be beneficial. Our first recommendation is giving expert nurses an opportunity to share their experiences and reflections on clinical situations and offer the novice nurse an opportunity to learn from the expert's experiences, ask questions and have an understanding of the critical thinking that led to that decision.

Second, establishing solid mentorship and the mentor/mentee relationship. Andrews (1999) focuses on the selection and training of mentors and creating a consistent approach to their preparation. This mentorship extends beyond working one on one. Andrews (1999) focuses on the importance of a trusting relationship to sustain the benefit of the mentor and mentee relationship to best support the novice nurse during and after orientation. Consideration for a formalized Nurse Residency program can help to provide the training to preceptors and facilitators and can provide a safe, non-punitive forum for residents to discuss lessons learned

and opportunities to improve. These programs can be instrumental in engaging seasoned nurses as mentors while helping novices learn to translate evidence into practice.

Third, surround novices with consistent, approachable resources that have had leadership training. This includes charge nurses that were approachable and having a reduction in patient assignment to improve accessibility (Kalisch, 2102). This also includes being mindful of unit skill mix. This is important to minimize novices relying on other novices for guidance (Ebright, 2004).

In conclusion, this paper focuses on the associations between nurse experience, clinical specialty setting, and level of nursing education with adherence to clinical practice guidelines for inpatient influenza and pneumococcal vaccination administration. The concepts and knowledge cited in this study could be applicable to other opportunities to continuously improve and to create a more consistent care delivery model at the bedside.

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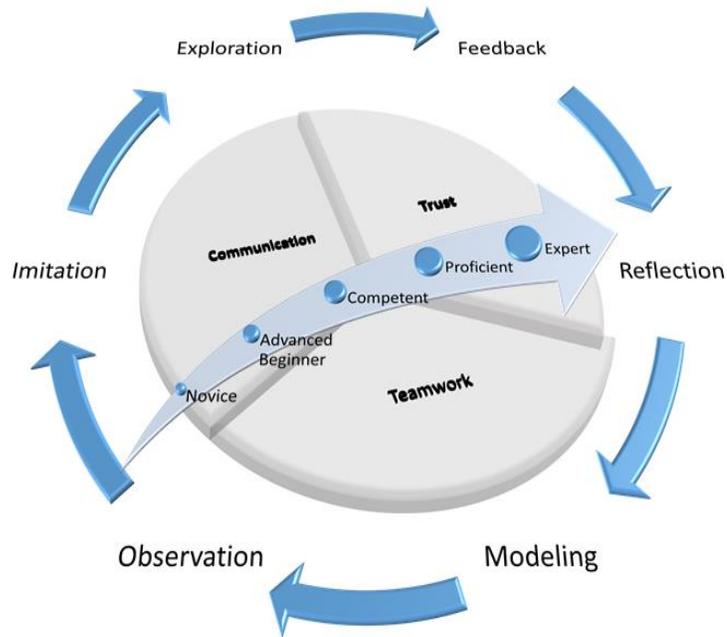
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**Appendix A**

**Diagram 1** - Benner's Model with Experience Transference across the Novice to Expert Continuum



### Appendix B - Data Collection Tool

Event # \_\_\_\_\_ Date & Time of Event: \_\_\_\_\_

Type:  Lack of Documentation  Initiation of Task but Incomplete  Omission of Task

Other: \_\_\_\_\_

Months of Experience in practice environment where event occurred? \_\_\_\_\_ months

Months of experience in current unit? \_\_\_\_\_ months

Level of Education:  Associates  Bachelors  Masters  Doctoral

Unit:  Specialty (ICU/CCU)  Non-Specialty (Med-Surg)

On the unit where the event occurred, did the Charge Nurse have a patient assignment?

No  Yes If Yes, how many patients does the charge nurse typically take? \_\_\_\_\_

On the unit where the event occurred, were organizational tools available (ie: Kardex or report sheets)?  Yes  No  Unknown

**Appendix C - Variable Table**

<b>Variable Table</b>			
Variable name	Variable Type	Theoretical/ Descriptive Definition	Operational Definition/ Specifications
Years of Experience in Practice Setting	Independent Demographic – Interval Count	Determine if RN was novice or new to practice environment	Years in Practice Setting 0 - >20.
Level of Nursing Experience	Independent Categorical	Stratified into Benner’s Theoretical Framework	Novice (< 1Year in practice setting)/ Advanced Beginner (>1 Year < 2Years)=1 Competent (2- 5Years in practice setting) =2 Proficient (5-10 Years in Practice Setting)/Expert (>10Years in Practice setting)=3
Specialty Practice Setting	Independent Categorical	Specialty or Non-Specialty Care Area	Non-Specialty Unit (Med-Surg) = 1 Specialty Unit (ICU/CCU) = 2

Nursing Education	Independent	Highest level of nursing	Associates Degree = 1
	Categorical	education	Bachelor's Degree or Above =2
Event outcome -	Dependent	Event outcome	Lack of Documentation =1,
Adherence to Clinical	Variable		Initiated by not completed =2
Practice Guidelines for	Categorical		Omission of Task=3
Inpatient Influenza and			Other =4 (To be defined)
Pneumococcal			
Vaccination			
Administration			

**Appendix D - Variable Table 2**

Variables	Adherence to Clinical Practice Guidelines		
	No	Yes	Analysis
Level of Practice	Frequency (%)	Frequency (%)	$\chi^2$
<ul style="list-style-type: none"> <li>Novice (&lt; 1Year in practice setting)/Advanced Beginner (&gt;1 Year but &lt; 2Years in practice setting)</li> </ul>	57.10%	42.90%	
<ul style="list-style-type: none"> <li>Competent (2- 5Years in practice setting)</li> </ul>	54.50%	45.50%	
<ul style="list-style-type: none"> <li>Proficient (5-10 Years in Practice Setting)/ Expert (&gt;10Years in Practice setting)</li> </ul>	52.90%	47.10%	
Specialty Practice Setting	Frequency (%)	Frequency (%)	$\chi^2$
<ul style="list-style-type: none"> <li>Medical – Surgical</li> </ul>	60.60%	39.40%	
<ul style="list-style-type: none"> <li>ICU/CCU – Critical Care</li> </ul>	47.10%	52.90%	
Highest Level of Nursing Education	Frequency (%)	Frequency (%)	$\chi^2$
<ul style="list-style-type: none"> <li>Associates Degree in Nursing</li> </ul>	64.70%	35.30%	
<ul style="list-style-type: none"> <li>Bachelor’s Degree and above</li> </ul>	55.60%	44.40%	

(Zhou, 2017, p. 2-3)



**Appendix F**

Table A

*Levels of Nursing Experience & Compliance with Clinical Practice Guidelines Crosstabulation*

Level of Nursing Experience		Compliance		
		Non-Compliant	Compliant	Total
Novice/Advanced Beginner	<i>n</i>	8	6	14
	% within Level	57.10%	42.90%	100.00%
Competent	<i>n</i>	6	5	11
	% within Level	54.50%	45.50%	100.00%
Proficient/Expert	<i>n</i>	9	8	17
	% within Level	52.90%	47.10%	100.00%
Total	<i>n</i>	23	19	42
	% within Level	54.80%	45.20%	100.00%

**Appendix G**

Table B

*Compliance with Clinical Practice Guidelines based on Specialty Setting*

Specialty Setting		Compliance		
		Non-Compliant	Compliant	Total
Med-Surg	<i>n</i>	20	13	33
	%	60.60%	39.40%	100.00%
ICU/CCU	<i>n</i>	8	9	17
	%	47.10%	52.90%	100.00%
Total	<i>n</i>	28	22	50
	%	56.00%	44.00%	100.00%

**Appendix H**

Table C

*Levels of Education and Compliance with Clinical Practice Guidelines  
 Crosstabulation*

Level of Education		Compliance		
		Non-Compliant	Compliant	Total
ADN	<i>n</i>	11	6	17
	% within Level	64.70%	35.30%	100.00%
BSN & Above	<i>n</i>	15	12	27
	% within Level	55.60%	44.40%	100.00%
Total	<i>n</i>	26	18	44
	% within Level	59.10%	40.90%	100.00%