2019

Reducing Door-to-Provider Times by Using Nurse Practitioners in Triage

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This is to certify that the doctoral study by

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Walden University
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Abstract

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MS, Loma Linda University, 2015

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Project Submitted in Partial Fulfillment

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Abstract

Increased patient wait times it the emergency department (ED) have been linked to poor patient outcomes and adverse health care events. The purpose of this quality improvement project was to determine if placing a nurse practitioner (NP) in the triage area would reduce door-to-provider times and improve patient throughput within the ED. The primary question for this quality improvement project was whether the use of NPs in the triage area would improve patient throughput and decrease wait times in the ED. A secondary question identified was if implementing an NP in the triage area would decrease patient length of stay in the ED. Rogers's diffusion of innovations model was used as a theoretical framework for the project. To evaluate the improvement in patient throughput in the ED, data were gathered for 12 months prior to and 12 months after the placement of an NP in the triage area. Data collection included door-to-provider times and door-to-discharge times. Analysis of the data using independent t tests showed no statistically significant reduction in door-to-provider times ($p = .278$) or overall lengths of stay in the ED ($p = .235$). There was an overall reduction in door-to-provider times of 11% and a 5% reduction in door-to-discharge times during the intervention. The implications of this project for social change include evidence that NPs are beneficial to the ED when used in the triage area. Based on the findings of this quality improvement project, it is recommended that an NP be placed in the triage area to decrease door-to-provider and door-to-discharge times, and to continue to improve the culture of the ED team to promote the use of NPs within the ED.

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Dedication

This project is dedicated to Dr. Marsha Serafin, for her continued support in my educational endeavors. And to my twin boys, for bringing joy to my life and making me laugh everyday. Last but not least, my parents. You are my heroes.

Acknowledgments

I would like to acknowledge all my mentors and preceptors who have helped me reach this achievement. Thank you to James Watson, my preceptor, for sharing your knowledge and wisdom. To Kimberly Hancock and Dana Lovorn for your endless support and being my strongest mentors. Thank you to Dr. Joanne (Jody) Minnick for acting as my project chair and answering my countless questions. To my DNP project committee members, Dr. Casey Cole and Dr. Donna Bailey.

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Section 1: Nature of the Project

Introduction

Since the implementation of the Affordable Care Act in 2012, overcrowding in U.S. emergency departments (EDs) has become worse (Boerner, 2016). Due to the increased number of patients seeking treatment, many patients suffer prolonged wait times. To cope with these increasingly dangerous conditions, some facilities are implementing a provider in triage (PIT) program to expedite patient care. The concept of PIT involves placing a provider in the triage area to perform preliminary patient assessments and initiate testing and interventions prior to patients being evaluated by their definitive provider (Bahena & Andereoni, 2013).

In November of 2016, one large urban hospital implemented a PIT program, which used a nurse practitioner (NP) in the triage area to help reduce patient wait times. Prior to this program, this facility did not use NPs in the ED. The first NPs were hired specifically for the PIT program with the hope of reducing patient wait times, reducing door-to-provider times, and improving patient throughput within the department. This change in practice was met with great resistance by the ED physicians, who believed that NPs had no place in the busy, high-acuity department. Demonstrating the effectiveness of the PIT program and tracking patient throughput showed that NPs played a vital role in the treatment team and effectively improved the quality and efficiency of patient care. By showing their value within the PIT role, the NPs hoped to change the culture of the department to welcome advanced practice nurses as a valuable part of the provider team.

Problem Statement

My purpose in this quality improvement project was to evaluate the improvements made to the ED by using an NP in the triage area. In the United States, there were 129.8 million ED visits in 2010, showing a significant increase from 119 million visits in 2006 (Pierce & Gormey, 2016). According to the American College of Emergency Physicians (2017), ED visits in the United States increased by 10 million visits per year since 2014. Due to the overcrowding and influx of patients, wait times increased significantly. Factors contributing to overcrowding in the ED include an aging population, limited access to medical care, and increasing use of the ED for nonemergency care (Pierce & Gormey, 2016). Overcrowding in the ED has been associated with delays in care, increased patient mortality, and poor patient outcomes (Chang et al., 2018).

The selected site for this project is a large academic urban hospital. The 53-bed ED treats more than 100,000 patients each year. The hospital is designated for both cardiac and interventional neurology. Average patient wait times range from 3 to 8 hours, depending on the time of day and season. My goal in the PIT program was to reduce patient wait times and expedite evaluation by a provider. This project is significant for nursing practice because it aims to demonstrate the value of using advanced practices nurses in the ED.

Purpose

The primary question for this quality improvement project was: Will the utilization of NPs in the PIT area improve patient throughput and decrease wait times in

the ED? The secondary was: Does implementing an NP in the triage area decrease patient length of stay in the ED? With increasing patient wait times in the ED due to overcrowding, it is imperative to improve efficiency of the triage process.

Reducing door-to-provider times has the potential to improve patient care and increase safety in the department. When patients are evaluated quickly, necessary lab work and imaging studies can be ordered and performed from the lobby. Patients with high acuity illnesses, such as chest pain or stroke, can be immediately evaluated by the NP and moved to the high acuity area in the back. Electrocardiograms are performed within minutes of arrival and stroke patients go immediately to computed tomography (CT) scan for imaging. Patients with sepsis or other time-sensitive illnesses also receive the necessary treatment shortly after arrival. Without the PIT provider in place, these patients may wait for several hours in the lobby without any treatment or life-saving interventions.

During the PIT program, the project site placed an NP in the triage area for 12 months; however, the NP was then removed and assigned to another treatment area. This practice change and role reassignment created a gap in practice. The gap in practice that I addressed in this project is the appropriate use of NPs in the PIT area to reduce patient wait times and improve outcomes for patients in the ED.

Nature of the Doctoral Project

The CDC (2017) reported that EDs across the nation treated 136.7 million patients in 2015. Studies have shown that placing a provider in the PIT area can significantly improve patient throughput times (Imperato et al., 2012; Pierce & Gormey,

2016). In this retrospective case study, I evaluated door-to-provider times both before and after implementation of an NP in the triage area. My purpose in this study was to evaluate improvement in patient throughput in the ED by using an NP in the triage area. The gap in practice addressed that I addressed in this project was the use of advanced practice nurses in all areas of nursing including the ED. The selected site for this project was a large academic urban hospital. This 53-bed ED treats more than 100,000 patients each year. The hospital is designated for both cardiac and interventional neurology. Average patient wait times range from 3 to 8 hours, depending on the time of day and season. Throughput data for the department was collected from the electronic medical record for 2015-2016 (prior to PIT program) and 2016-2017 (during PIT program implementation). The data were organized into "without" and "with" PIT provider. Analyzing this data will help to determine whether placing an NP in the triage area significantly reduced patient wait times and improved patient throughput within the department.

Significance

As a primarily donor funded hospital, this facility had many stakeholders who are affected by this practice problem. The local community is diverse and composed primarily of older patients and patients of Hispanic descent. Both of these populations bring health challenges and multiple comorbidities, which may put them at risk of poor health outcomes if they are left to wait for many hours in the lobby. The board of directors and administration for the hospital are also negatively affected by poor patient outcomes and sentinel events that occur in the lobby while waiting for a room assignment in the department. They answer to regulatory bodies in the event of a patient death or

injury. Ultimately, the hospital is responsible for the outcome of every patient that registers in the department. The ED physicians are stakeholders in the department as well. The physicians group is a for-profit group that participates in quarterly profit sharing. Patients who leave the department without being seen due to prolonged wait times have the potential to negatively impact their productivity earnings. The PIT NP, who only performs preliminary screenings on patients, will not deduct from their patient revenue for patients seen. The nursing staff and NPs are also stakeholders because they desire to expand the role of advanced practice nurses within the department.

There were several implications for social change related to this project. First, demonstrating that NPs can be a useful, safe, and efficient part of the ED team helped to change the culture of the department to be more inclusive and welcoming for advanced practice nurses. Information gathered during the course of this project can be used in other departments within the hospital that currently do not use NPs. Also, by reducing patient wait times in the ED we can potentially improve patient outcomes by expediting patient care and ensuring that patients receive the proper treatment in a timely manner.

Summary

Overcrowding in the ED with prolonged wait times has become an overwhelming problem in the acute care setting. To cope with these increasingly dangerous conditions, some facilities are implementing a PIT program to expedite patient care. My purpose in this quality improvement project was to evaluate the improvement in patient throughput by utilizing an NP in the triage area to perform an initial medical screening exam on all patients during the triage process. The goal was to demonstrate that the PIT program can

reduce door-to-provider times and patient length of stay while showing that NPs are a valuable addition to the emergency team.

Section 2: Background and Context

Overcrowding in the ED can lead to prolonged patient wait times and poor patient outcomes. My purpose in this quality improvement project was to evaluate the improvement in patient throughput in the ED by using an NP in the triage area. The practice-focused questions were: Will the utilization of NPs in the PIT area improve patient throughput and decrease wait times in the ED; and: Does implementing an NP in the triage area decrease patient length of stay in the ED? My goal in this study was to demonstrate that NPs can decrease door-to-provider times in the ED and decrease length of stay within the department. The following section discusses the background and context of the project including applicable nursing models, relevance to nursing practice, role of the DNP student, and local context for the project.

Concepts, Models, and Theories

The purpose of triage in the ED is to prioritize incoming patients and identify those patients that must be seen immediately (Pierce & Gormey, 2016). Patients in the ED are categorized by acuity level based on the ESI acuity system. The ESI acuity system is the most widely used ED triage acuity system in the United States (Mistry et al., 2018). Developed by Wuerz and Eitel (2000), the Emergency Severity Index, is a 5-level triage scale that uses an algorithm (see Appendix A) to evaluate each emergency room patient based on severity of illness and resource needs.

ESI Acuity 1. Level 1 patients are critically ill and require immediate lifesaving interventions (Chonde et al., 2013). This includes cardiopulmonary resuscitation (CPR).

ESI Acuity 2. Level 2 patients require urgent but not immediate lifesaving interventions (Chonde et al., 2013). They require many health care resources during the course of their treatment. A health care resource is defined as a procedure, test, or medication administration (Chonde et al., 2013). Level 2 patients include patients with chest pain, stroke symptoms, or sepsis. A stable patient with a pain level of 7 or greater should be upgraded to a level 2 acuity (Mistry et al., 2018).

ESI Acuity 3. A Level 3 patient is acutely ill but not in immediate danger of poor health outcomes. Level 3 patients also require multiple health care resources. Most patients with abdominal pain are triaged as a Level 3 because they require laboratory testing, imaging studies, IV fluids, and multiple doses of medication.

ESI Acuity 4. Level 4 acuity patients are generally healthy and require only one healthcare resource (Chonde et al., 2013). An example would be a patient with an ankle injury who requires an x-ray.

ESI Acuity 5. A triage acuity level 5 patient requires no direct health care resource (Chonde et al., 2013). This includes patients presenting for a medication refill or to have their TB test read by a nurse. This would also include a pediatric patient with an earache who needs only a physical exam and a prescription for antibiotics.

Diffusion of Innovations Model

The framework that I chose to implement was Everett Rogers' diffusion of innovations model. According to Rogers's model, innovation refers to any new technology, ideas, practice, philosophy, or social system (Mohammadi et al., 2018). His model suggests that new ideas or practices can be infused through the culture of the

social system. His theory also suggests that change is adopted as a process, starting with those members of the social system that accept change more easily. In this case, the new practice is implementing an NP in triage in the ED. This model was applicable to the project because the new practice change followed a trickle-down effect. Initially when the NP group arrived in the ED, only the new and younger physicians were welcoming to the idea of the PIT program. The majority of the physicians were resistant to the new practice change and eventually accepted the change, coinciding with Rogers's belief that change is an adopted process that occurs over time. Rogers's model relies greatly on peer-to-peer interaction to propel a new change or practice, which ties closely with the patient care team in the ED (Rogers, 1995).

According to Rogers's model, there are five categories of adopters in the diffusion process: Innovators, early adopters, early majority, late majority, and laggards (Rogers, 1995).

Innovators. Innovators are the first individuals to adopt a new practice change. They tend to be younger and favor science and innovation (Rogers, 1995).

Early adopters and early majority. These individuals follow closely behind innovators, also tend to be younger and more technologically savvy than their older counter parts (Rogers, 1995). Many early adopters and early majority hold leadership roles and share their opinion with peers.

Late majority. This group is more skeptical of change and only accepts a new practice or idea after the majority of other members have already accepted the change (Rogers, 1995).

Laggards. The last group to adopt change. They tend to be older, more resistant to change, and value tradition (Rogers, 1995). Because the emergency physicians group was resistant to the practice change, most physicians fell into the late majority or laggard category. Only the newer and younger physicians in the group accepted the NPs early in the PIT program.

Rogers described five phases of innovation adoption: Knowledge, persuasion, decision, implementation, and confirmation (Rogers, 1995).

Knowledge. Occurs when an individual is exposed to a new idea or innovation. In the persuasion phase, the individual or adopter becomes interested in the innovation based on its perceived attributes (advantages, disadvantages, ease or complexity of use (Mohammad et al., 2018).

Decision. This phase requires the individual to make a choice whether to adopt or reject the change (Rogers, 1995).

Implementation. Implies that the individual chose to adopt the change and incorporate the new practice (Rogers, 1995).

Confirmation. The continued acceptance and use of the innovation in practice (Rogers, 1995).

Relevance to Nursing Practice

As EDs become more overcrowded and wait times increase, patients are at an increased risk of poor health outcomes. Current research at the time of the study suggested a decrease in door-to-provider time and decreased length of stay in the ED associated with early patient evaluation by a PIT (Imperato et al., 2012; Pierce &

Gormey, 2016). Pierce & Gormey (2016) demonstrated a 47% decrease in door-to-provider times and 16% reduction in overall length of stay. Nestler et al. (2013) showed a significant reduction in mean length of stay of 41 minutes after placing a midlevel provider in the PIT area. A study by Weston et al. (2017) showed a decrease in median length of stay and also a decrease in patients who left without being seen after placing a provider in the triage area. Their study also showed an increase in patient satisfaction scores associated with the PIT program (Weston et al., 2017). Cheng et al. (2013) reported a similar study in which they placed a resident physician in the PIT area for patient screening exams. Their study also showed a significant reduction in patient wait times and overall length of stay. French et al. (2014) showed no significant reduction in door-to-provider times, however showed deceased overall length of stay.

To improve front end operations and decrease wait times, many EDs have triage protocols in place that allow the triage nurse to place preliminary orders based on presentation and chief complaint. For example, if a patient presents complaining of chest pain, the triage nurse is authorized to order an EKG, chest x-ray, and cardiac enzyme laboratory studies to expedite patient care. These protocols do not include invasive imaging, such as MRI or CT scan. They also include only a limited number of medications, such as antipyretics and anti-emetics. The physician or practitioner must order pain medications and antibiotics. The triage nurses also practice on limited education and training. NPs are better prepared to evaluate and treat patients in the clinical setting.

Prior to the implementation of the PIT program in 2016, this facility had never employed NPs in the ED. The physicians group strongly opposed the presence of NPs in the department, insisting that the quality of care would decline by bringing "midlevel providers" into the department. The stigma that follows NPs, or "midlevel providers," is that their care is subpar to that of a physician. Studies have shown that tests and interventions ordered by NPs in the PIT setting are not significantly different than those ordered by physicians, demonstrating that NPs can give the same quality of care as physicians in the PIT area (Begaz et al., 2017). Literature has also indicated that placing a provider in the PIT area can reduce door-to-provider times and improve patient throughput in the department (Victoria et al., 2017). The goal of this study was to not only demonstrate that NPs can decrease door-to-provider times in the ED, but also that they can improve the quality and efficiency of patient care and improve patient outcomes as valuable members of the emergency team.

Local Background and Context

The site for this quality improvement project was a large urban tertiary care hospital in the Southern United States. With a current population of 2.5 million citizens and an average yearly growth rate of 4.5%, the setting for this QI project is the 4th most populated county in the state (US Census Bureau, 2017). Due to recent population growth and an increase in year-round residents in the area, the three local EDs have noted a significant increase in patient wait times. The site for this project was an acute care hospital with 476 inpatient beds and 53 ED beds. The ED is a designated stroke and STEMI center, meaning that all local patients requiring interventional cardiology or

neurology are diverted to this facility. Trauma patients are designated to another facility. The hospital was also designed as a MAGNET facility in 2015 by the American Nurses Credentialing Center, who encourages the use of advanced practice nurses in all disciplines. Prior to MAGNET certification, NPs were not given privileges in the hospital.

Before the implementation of the PIT program, patients at this facility checked in with registration and then waited in the lobby to be triaged. The triage nurse then evaluated the patient and placed any appropriate orders that are considered part of the triage protocol. Level 4 and level 5 patients were directed to the urgent care area to await treatment by a physician's assistant (PA). Higher acuity patients were placed back in the lobby to await a room in the main ED. After implementation of the NP in triage, the flow of patients in the triage area changed significantly. After triage, patients were placed in one of three treatment rooms near the front door. The NP evaluates the patient and ordered any appropriate testing. EKGs and breathing treatments were also completed in these rooms. Pain medications were administered and urine samples were collected. Patients were then placed back in the lobby to await phlebotomy, radiology, or room assignment. Critical patients were taken back to rooms immediately.

Role of DNP Student

I have held several positions at this facility throughout my nursing career. I started as a nurse in the ED in 2011. At that time, the department did not employ NPs or physician's assistants (PAs). Only physicians were allowed to treat patients. In 2013, the urgent care area opened and was staffed by PAs only. The medical director at that time

felt that PAs were better prepared for the pace and acuity of patients seen in the ED. At that time I was in school to become an NP and completing my clinical hours in the department with one of the ED physicians. I watched the interaction between the physicians and the PAs and saw the resentment they received from the doctors. After finishing my NP program I accepted a position at another local ED. In November of 2016 the medical director called and asked me and three of my colleagues to come back to our old department as NPs, promising that we would be welcomed with open arms to help decompress the department. He was wrong.

Our group of 4 NPs was met with resistance from both the physicians group and the PAs. Perhaps they saw us as competition or perhaps they viewed us as incompetent providers. For months we were shunned every day at work. Some ignored us completely, refusing to allow us to present cases or ask questions about patient care. Other simply told us "we don't want you here." It took six months to change their culture. After working in the department through the busy season (November- June), some of the group began to see our value and the contributions we made to the department. They saw firsthand the reduction in wait times, improvement in lengths of stay, and increase in patient satisfaction scores after placing an NP in triage. Over the last 2 years, we have surpassed their expectations and carved out a critical role for ourselves in the department. My goal in completing this project was to present my results to the physician's group to show the extent of our value and the improvement we bring to the department as advanced practice nurses.

Because I am a member of the NP team involved in this study, my views on this topic may be biased. I strive daily to show that we improve the department through our hard work and dedication. For this reason, I worked diligently to ensure that the data presented is true and not biased based on my personal feelings regarding the ED.

Summary

Overcrowding in the ED leads to increased patient wait times and places a strain on healthcare resources. These conditions have the potential to negatively impact patient outcomes, especially in critically ill patients. Current research shows that implementing a PIT program utilizing an NP has the potential to decrease patient wait times and expedite patient care, decreasing the detrimental effects of overcrowding in the ED. In the sections to follow, I will discuss the collection and analysis of data and project design.

Section 3: Collection and Analysis of Evidence

Overcrowding in the ED can lead to prolonged patient wait times and poor patient outcomes (Chang et al., 2018). Due to recent population growth and limited health care resources in the community, the ED wait times at this facility have increased significantly during the last several years. My purpose in this quality improvement project was to determine whether implementing a PIT program with an NP in triage can help improve patient throughout and decrease wait times in the ED. I gathered data from the electronic medical record and used to compare door-to-provider times and door-to-discharge times for patients 12 months prior to the PIT program and 12 months after implementation. The data were analyzed to determine whether the PIT program improved patient throughput within the department. Because many of the ED physicians were resistant to the PIT program and the addition of NPs to the department, Rogers's diffusion of innovations model was used to promote culture change within the department (Rogers, 1995).

Practice-Focused Question

Since the implementation of the Affordable Care Act in 2012, EDs in the United States have suffered from overcrowding and prolonged patient wait times (Boerner, 2016). EDs are struggling to adapt to these challenges by improving front-end operations. The purpose of this study was to evaluate improvements in patient throughput in the ED by utilizing an NP in the triage area. The practice-focused questions for this study were: Will the utilization of NPs in the PIT area improve patient throughput and decrease wait times in the ED?, and Does implementing an NP in the triage area decrease overall patient length of stay in the ED? Data were compared from 12 months before and 12

months after the implementation of the PIT program to determine whether placing an NP in the triage area to perform initial medical screening exams would improve patient throughput and reduce wait times.

Sources of Evidence

To evaluate the improvement in patient throughput in the ED, data were gathered from the electronic medical record for 12 months prior to and 12 months after use of an NP in triage. The data included door-to-provider times and door-to-discharge (or admit) times. The data from before the PIT program was compared with data from after the PIT program to assess for an improvement in mean door-to-provider times and door-to-discharge times. The facility's electronic medical record, Epic (2018) allowed for the collection of such data from department records. The data were anonymous and did not contain any identifying patient information. A member of the ED informatics team pulled the data and deidentified any information that contained sensitive patient information. All data provided to me were anonymous and contained no identifying patient information. This data only included patient volumes, wait times, ESI acuity levels, and discharge times. Door-to-provider and door-to-discharge times from before and after the initiation of the PIT program were compared to determine whether placing an NP in triage indeed reduced patient wait times and improved throughput within the department.

Archival and Operational Data

Data pertaining to patient volume, acuity, and wait times is routinely collected by the administration for purposes of staffing and budget. The ED informatics team audits and maintains the electronic medical record data. This department generates daily reports

which are reviewed by the ED director, charge nurses, house supervisor, and staffing administration. This helps to determine staffing needs within the department. Monthly, quarterly, and yearly reports are generated and reviewed by hospital administration and board of directors for budgeting purposes. These reports can easily be accessed from the electronic record and show patient volume, acuity, and wait times for each day or a monthly average. Monthly were collected and analyzed for the 12 months prior to and 12 months after implementation of the PIT program.

To gain access to departmental data, I obtained permission from the ED director and ED medical director, who both consented to my participation in this project. I also presented my project proposal to the Nursing Research Council for the site, who gave their consent and IRB approval for data collection. The data collected are relevant to the practice problem because it demonstrated the severity of overcrowding and increased patient wait times within the department, as well as improvements in these times after implementing the PIT program.

Analysis and Synthesis

All data for the project were deidentified to protect patient confidentiality. There were no patient names, birthdates, or medical record numbers collected. Patient that were assigned an ESI acuity Level 1 were be removed from the data as outliers, because they are immediately placed in an ED bed and bypass the triage process. Level 4 and Level 5 patients were also be removed as outliers because they are immediately designated to the urgent care area and treated by another midlevel provider. These patients did not receive

a medical screening exam from the NP in triage, only a triage assessment by the ED triage nurse. Only acuity Level 2 and Level 3 patients were included in the study.

Data was analyzed using IBM SPSS Version 25 software to compare mean times for door-to-provider and door-to-discharge with and without the presence of an NP. An independent I test was used, with $p < .05$ considered to be statistically significant. I hypothesize that there will be a negative correlation between the PIT program and patient wait times. The Walden University Manual for Quality Improvement Evaluation Projects (Walden University, 2017) was used to ensure compliance with academic guidelines as outlined by Walden University. Institutional Review Board (IRB) approval was obtained from Walden University as well as the project site. All data was stored on a password protected flash drive and locked in the ED manager's office to protect patient information.

Summary

Prolonged patient wait times in the ED can negatively impact patient health outcomes and place increased stress on department resources. Limited healthcare resources and increasing population demands in the local community have placed a strain on the ED. Large population increases in the area without increasing healthcare facilities have cause a significant rise in patient wait times in the ED. The purpose of this study was to determine whether utilizing an NP in the triage area could reduce door-to-provider times and improve patient throughput. The practice-focused questions for this study were, "Will the utilization of NPs in the PIT area improve patient throughput and decrease wait times in the ED?" And, "Does implementing an NP in the triage area decrease overall

patient length of stay in the ED?" Comparing average wait times before and after initialization of the PIT program demonstrated the effectiveness of the program in reducing wait times and lengths of stay.

Section 4: Findings and Recommendations

Introduction

According to the American College of Emergency Physicians (2017), ED visits in the United States have increased exponentially during the last decade. Overcrowding in the ED can lead to increased patient wait times and poor patient health outcomes (Chang et al., 2018). My purpose in this quality improvement project was to determine whether placing an NP in the triage area could reduce door-to-provider times and improve patient throughput in the ED. The primary question for this project was: Will the use of NPs in the PIT area improve patient throughput and decrease wait times in the ED? The secondary was: Does implementing an NP in the triage area decrease patient length of stay in the ED?

The site for this retrospective QI project used an NP in the triage area for 12 months in 2016-2017, then removed the PIT provider and assigned them to another area, leaving the triage area staffed by registered nurses alone. This practice change and role reassignment created a gap in practice. Published journals at the time of the study reported that placing a provider in the PIT area would reduce patient wait times, improve patient safety, and increase patient satisfaction (Chang et al., 2018; Boerner, 2016). My purpose in this study was to evaluate improvements in patient throughput in the ED by using an NP in the PIT area. Following IRB approval from both Walden University and the project site, I collected data from the electronic medical record from November 2016 to November 17. This was completed with the assistance of the informatics team for the ED and under the direct supervision of the ED director. SPSS (2018) software was used

to comparing door-to-provider times and door-to-discharge times for patients 12 months prior to the PIT program and 12 months after the PIT program.

Findings and Implications

During the PIT program timeline (November 2016 to October 2017), a total of 59,025 ESI acuity Level 2 and Level 3 patients were seen in the ED. Only ESI acuity level 2 and 3 patients were considered for the study. Levels 1, 4, and 5 patients were removed as outliers because these patients bypassed the PIT evaluation and were assigned to other areas of the department without being evaluated by the NP. Analysis of the data shows no statistically significant reduction in door-to-provider time ($p = .278$) and no significant reduction in overall length of stay ($p = .235$) with the use of an NP in the PIT area.

Although statistical analysis of the data using independent *t* tests shows no statistically significant reduction in door-to-provider times or door-to-discharge times, an overall reduction in both of these times is evident during most months of the PIT program (see Table 1 and Table 2). There was an 11% average decease in door-to-provider time during the PIT program. The mean door-to-discharge time decreased by 5% during the intervention. Some months during peak vacation season showed even more significant improvements. For example, the month of February showed a 33% reduction in door-to-provider times and an 18% reduction in lengths of stay during the PIT program. Also important to note is that patient volumes increased by 4% during the project timeline. For example, the month of May demonstrated a 10% increase in patient volume but no

reduction in door-to-provider time. Had the overall number of patients remained the same, a more significant reduction in these times may have been evident.

Table 1

Average Door-to-Provider Times Before and During PIT Program (November 2015 to October 2017)

Date	Time without NP (min)	Volume	Date	Time with NP (min)	Volume
Nov 2015	69.5	4,653	Nov 2016	63	5,295
Dec 2015	81	4,989	Dec 2016	80	5,304
Jan 2016	99	5,153	Jan 2017	98.5	5,411
Feb 2016	136.5	5,323	Feb 2017	92.5	4,905
Mar 2016	114	5,432	Mar 2017	108	5,615
Apr 2016	90	4,885	Apr 2017	89	5,150
May 2016	76.5	4,557	May 2017	63.5	4,985
Jun 2016	80.5	4,398	Jun 2017	73.5	4,546
Jul 2016	87.5	4,338	Jul 2017	82	4,433
Aug 2016	70.5	4,363	Aug 2017	62	4,327
Sep 2016	75	4,251	Sep 2017	67	4,473
Oct 2016	74	4,494	Oct 2017	59.5	4,581

Note. PIT, provider in triage; NP, nurse practitioner.

Table 2

Average Door-to-Discharge Times Before and During PIT Program (November 2015 to October 2017)

Date	Time without NP (min)	Volume	Date	Time with NP (min)	Volume
Nov 2015	298.5	4,653	Nov 2016	288	5,295
Dec 2015	315.5	4,989	Dec 2016	307	5,304
Jan 2016	364	5,153	Jan 2017	341	5,411
Feb 2016	411	5,323	Feb 2017	336.5	4,905
Mar 2016	373.5	5,432	Mar 2017	350	5,615
Apr 2016	320	4,885	Apr 2017	339	5,150
May 2016	335	4,557	May 2017	327.5	4,985
Jun 2016	322.5	4,398	Jun 2017	336.5	4,546
Jul 2016	322.5	4,338	Jul 2017	334	4,433
Aug 2016	305.5	4,363	Aug 2017	287	4,327
Sep 2016	312	4,251	Sep 2017	287.5	4,473
Oct 2016	307	4,494	Oct 2017	287	4,581

Note. PIT, provider in triage; NP, nurse practitioner.

Prior to the study, there were no NPs in the ED and very few advanced practice nurses in the hospital as a whole. The implications for social change for the project included the opportunity to demonstrate to the facility and the physician's group that NPs are beneficial to the department when used in the PIT area. Although the data analysis showed no statistically significant improvement in patient throughput, looking at the data it is clear to see that during the PIT program there was an increased volume of patients seen with door-to-provider and door-to-discharge times that either remained constant or slightly improved (see Figure 1). Seeing a larger patient population in the same or less amount of time suggests that NPs are indeed beneficial to the department and help to expedite patient throughput.

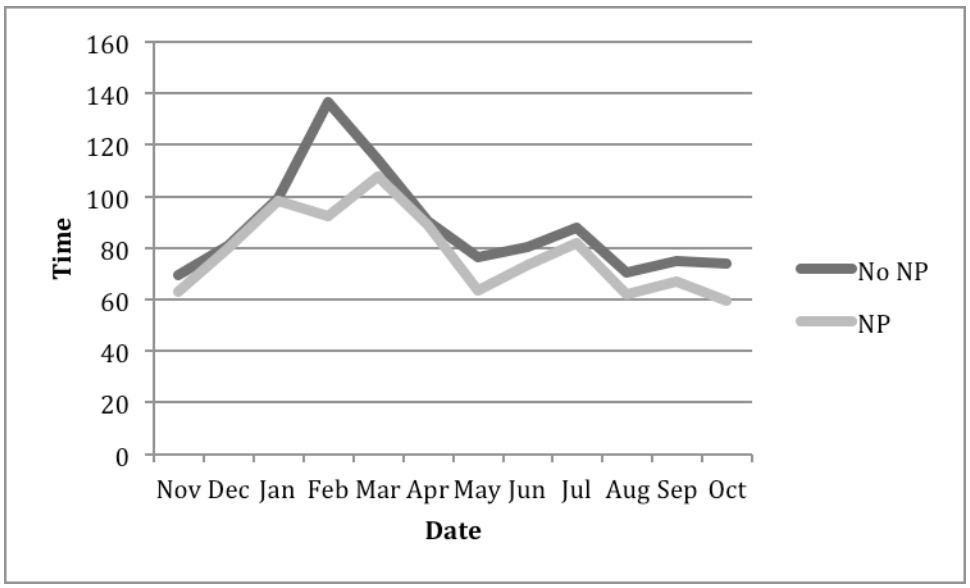

Figure 1. Average door-to-provider times before and during PIT program.

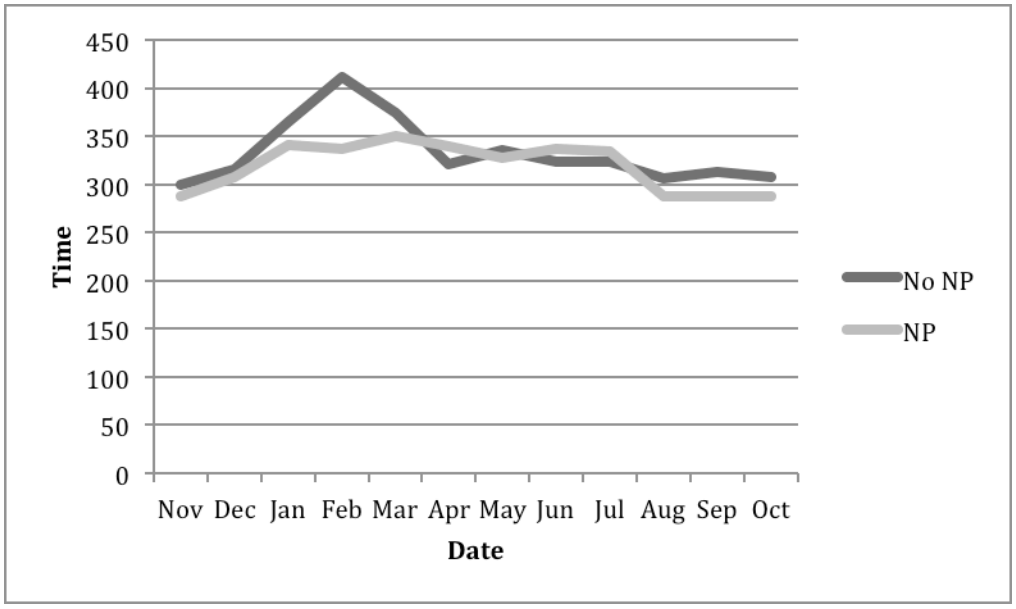

Figure 2. Average door-to-discharge times before and during PIT program.

Recommendations

Current literature recommends the utilization of a provider in the triage area, whether it is a physician, resident physician, or NP (Chang et al., 2018). For 12 months, the PIT program used an NP in the triage area to evaluate patients quickly upon arrival and initiate the appropriate testing and treatment based on illness. The PIT program was then terminated and the NP role was moved to another area of the department, leaving only the triage RN to evaluate patients upon arrival. This reassignment created a gap-in-practice that was addressed in this project. Based on the findings of this quality improvement project, it is recommended that an NP be placed back in the triage area to decrease door-to-provider and door-to-discharge times. Although comparing overall average wait times showed no statistically significant reduction in door-to-provider and door-to-discharge times, careful analysis of the data reveals an increased number of patients were seen in the department with marginally reduced wait times which indicates that the program was indeed effective.

Contribution of the Doctoral Project Team

Although there was no formal DNP project team, several individuals were involved in the collection and analysis of data. The informatics liaison for the ED assisted with data retrieval and organization. The ED director was also instrumental in clarifying and organizing data after it was gathered. A masters prepared statistician was consulted during data analysis. The Nursing Research Council for the project site also assisted in the design and implementation of the project.

Strengths and Limitations of Project

There were several significant limitations to the study, largely related to the retrospective design and data collection. First, during the project timeline the facility did not have continuous NP coverage in the PIT area. There was no NP present from 3 AM until 9 AM. There was, however, at least partial coverage seven days per week during the 12-month study period. This gap in coverage, in addition to the design of the ED which funnels ambulances toward a separate back entrance, made it impossible to differentiate which patients were seen by NP and which patients were placed straight into a bed and bypassed the PIT process. Future studies of this nature should specify which patients arrived during the NP hours rather than a daily or monthly time average. The short duration of the PIT program and limited sample size also restricts the availability of data and limited the results. It would be helpful for future studies to have a larger window of time with more patients seen in the PIT area to determine whether a significant reduction in time is feasible.

Because the study design provided insignificant results due to the increased patient volumes, plans for future research include a further analysis of door-to-provider times and door-to-discharge times. I propose a breakdown of individual patient charts to examine these times rather than comparing overall monthly average times. This will allow for correction of the inequality of patient volumes and give a more clear representation of the improvements made by the PIT program. This will also eliminate outliers that could of caused the numbers to vary or be extended due to issue in the process. Examples include: high volumes/understaffing, breaks for staff, and prolonged

triage or a patient that went to the wrong area from incorrect triage. I have proposed these recommendations to the Nursing Research Council for the project site.

Section 5: Dissemination Plan

For this practicum site facility, the most appropriate dissemination plan would be presentation to the Nursing Research Council (NRC) at their monthly meeting. The NRC includes many of the nursing administrators, including the CNO and all department directors, as well as members of the Magnet council and new graduate nurses. The NRC would provide a diverse forum of peers to evaluate the project. Due to the minimal available research on PIT practitioners and ED throughput strategies, peer reviewed journals and nursing publications are also an appropriate avenue for dissemination. My goal in completing this project was to present the results to the ED physician's group at their quarterly meeting to demonstrate the value of the NPs in the department and the potential we represent for improved patient care. This presentation has been approved by the ED medical director and will occur during their next meeting.

Analysis of Self

During my practicum experience in the DNP program, I had the opportunity to grow and develop my leadership skills and explore my role as a scholar. As an NP and advanced practice nurse, my role has always included acting as a leader and example for my nursing peers. During the course of this project, I worked as part of an interdisciplinary team of nurses, administrators, educators, and providers to gather data and evaluate ways to provide better care for our patients. My role as a project manager gave me the ability to examine some of the pitfalls and shortcomings of our department and ways to improve our efficiency and organization. Upon completion of the project, I was disheartened by my results and had hoped to show a more significant improvement

in patient throughput with the PIT program. The results have left me anxious to expand on my project and gather more data. Through my project, it is my hope that I can provide valuable insight for the ED team and expand the practice of NPs in our facility the fullest extend of our scope.

Summary

The use of evidence-based practice in nursing requires the conscious application of knowledge gained from research, clinical experience, and patient values (Horntvedt et al., 2018). The ED is a crowded, fast paced, and often chaotic environment, which leaves the potential for poor patient health outcomes. In November of 2015, this project site placed an NP in the triage area to help reduce patient wait times. The NP was later removed from the triage area and the PIT program was terminated. The gap in practice created by the role reassignment left patients at risk of poor health outcomes due to prolonged wait times and overcrowded conditions in the ED. The purpose of this QI project was to determine whether placing an NP in the triage area would reduce door-to-provider times and door-to-discharge times in the ED. Although no statistically significant difference was found when comparing average monthly wait times, close analysis of the data collected indicated that NPs are indeed successful in improving patient throughput in the ED.

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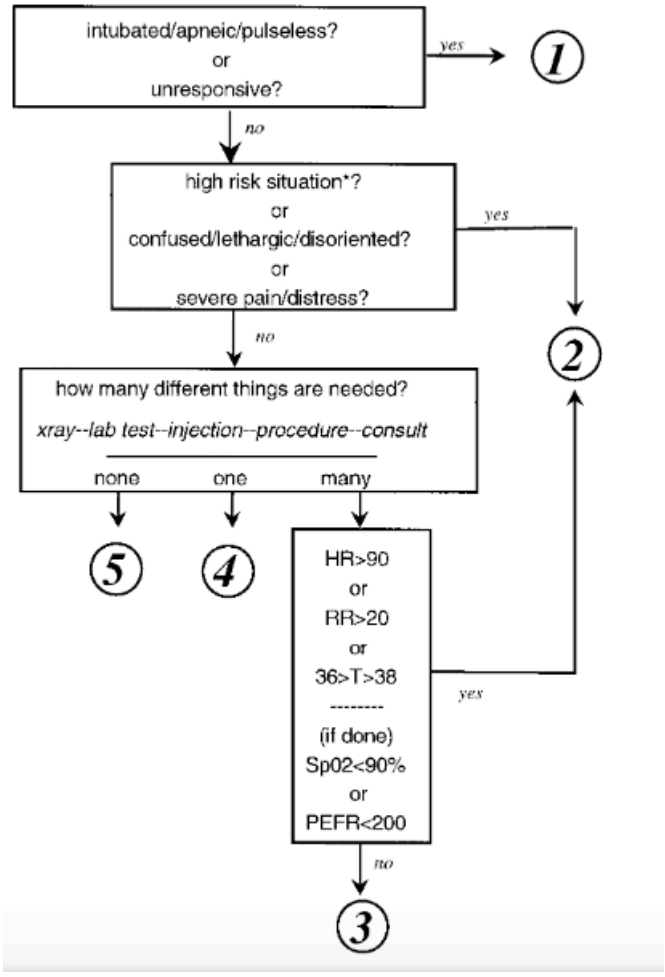
Appendix A: ESI Triage Algorithm



Appendix B: Written Permission for ESI Algorithm

Stacey Roseen 1:28 PM

Re: Reprint permission

To: mandersonnp@gmail.com

AEM Editor in Chief, Jeffrey Kline, MD, on behalf of SAEM, gives permission to your request to reprint Fig 1 (ESI algorithm) from p.237 of the article, Reliability and Validity of a New Five-level Triage Instrument, with the understanding that this figure will only be reprinted in your dissertation for your DNP at Walden University and that it will be cited as such: Wuerz, R. C., Milne, L. W., Eitel, D. R., Travers, D., & Gilboy, N. (2000). Reliability and validity of a new five-level triage instrument. Academic Emergency Medicine: Official Journal Of The Society For Academic Emergency Medicine, 7(3), 236–242.

Thank you.

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