Implementing a Triage Protocol in the Urgent Care

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Abstract

The increasing number of patients visiting the emergency room has caused overcrowding and overwhelmingly long wait times in the emergency room, resulting in increased patient volume in the urgent setting. The increase in patient volume has caused an increase in patient wait times as well as delayed evaluations by the healthcare providers in the urgent care setting. This quality improvement project aimed to decrease the timeframe of door to provider by implementing a Triage Algorithm Protocol (TAP) project, which included training for nursing and ancillary staff in the TAP, patient throughput, and standardized protocols. This was demonstrated by utilizing evidence-based clinical research and theoretical methods to develop a Triage Algorithm Protocol that will best fit the urgent care setting. The TAP was shown to have a positive impact in the urgent care setting by reducing door to provider time in correlation with nurses' prioritization and delegation skills.

Implementing a Triage Protocol in the Urgent Care

The increasing number of patients visiting the emergency room has caused overcrowding and overwhelmingly long wait times. A 2018 study by O'Keeffe, Mason, Jacques, and Nicholl found that approximately 15 percent of patients seen in the emergency room had non-urgent complaints. The use of emergency rooms for non-urgent complaints has opened business opportunities for urgent care centers to see the lower acuity patients in hopes of decompressing the emergency room. Due to the inconvenient office hours of physicians and the two to three weeks wait times for appointments, the patient population is utilizing urgent care for immediate medical complaints (Harding, Taylor, & Leggat, 2011; Munjal et al., 2015).

Over time, urgent care patient volume has increased from as low as 20 patients per day to more than 100 patients per day (Memmel, & Spalsbury, 2017). The host site is an urgent care that sees between 70 and 100 patients per day. Patients are seen by the providers on a first-come, first-served basis. Currently, there are no triage protocols to prioritize patients who come in to be seen with more serious complaints, such as abdominal pain, chest pain, or shortness of breath. Another issue the current practice fails to address is the patient acuity levels, which can range from low to high in this urgent care. Many patients come in to the urgent care setting to receive emergent care due to increased wait times in the emergency rooms (Memmel, & Spalsbury, 2017). The urgent care's current system of first-come, first-served does not address the higher emergent level of care, which then leads to increased adverse events and poor patient outcomes. A first-come, first-served system can delay door to provider time for patients with higher acuity levels; therefore, a TAP is necessary to determine a patient's acuity level and decrease door to provider time. This urgent care needs a TAP to help identify patients who need to be seen by a provider sooner to avoid adverse events

According to the Canadian Medical Protective Association [CMPA] (2007), there are liability consequences for healthcare corporations that have experienced patient adverse events while waiting to see providers. Healthcare corporations face financial loss when patient adverse events occur (CMPA, 2007). Similarly, in the United States, the Office of Inspector General (OIG) of the U.S. Department of Health and Human Services and American Health Lawyers Association (AHLA) (2007) reports "all levels of a health care organization, from the direct caregiver to the governing body of an institutional provider, could face liability for failing to meet the quality of care obligations" (p. 16). All adverse events are reported to Joint Commission. According to the Office of Inspector General (OIG) of the U.S. Department of Health and Human Services (2007), failure to address quality and patient safety issues could result in potential enforcement action penalties and fine. The Department of Human and Health Services also regulate patient safety. These organizations can fine healthcare clinics for adverse events. Further, the employers will be required to develop an organized plan to avoid recurrent events (CMPA, 2007). The best approach to avoiding these unpredictable adverse events is to prevent them from happening. This urgent care needs a triage algorithm protocol (TAP) to reduce door to provider time, improve patient outcomes, and reduce the risk of adverse events.

Background

Triage algorithm protocol is an official procedure or system of rules that guides the healthcare staff to determine which patient is next to be evaluate by the healthcare provider based on the vital signs and chief complaints, which plays a significant role in the determination of the patients' acuity levels (Christ et al., 2010). Patients with abnormal vital signs will be evaluated sooner rather than later. Abnormal vital signs result in a higher risk for hospital admission, poor healthcare outcomes, and death (Mehmood et al., 2015; Nguyen et al., 2017).

Decreasing door to provider time for patients with abnormal vital signs and emergent chief complaints will help to improve patients' healthcare outcomes by initiating early appropriate interventions.

TAPs were originally created to manage patient volume and prioritize the order to which patients should be seen by the emergency department providers. Due to the long wait times in the emergency departments, the public has turned to urgent care clinics for not only routine complaints that can be handled in a primary care clinic, but they come to the urgent care with emergent life-threatening medical conditions, which requires immediate attention (Memmel, & Spalsbury, 2017). Consequently, outpatient urgent care clinics started to utilize TAPs to help them identify patients who needed to be seen by the provider sooner rather than later. The clinics that utilized TAPs found that it was effective for patient flow and prioritizing which patients needed a sooner appointment (Layton, Tovar, Wiggins, Rayens & Salt, 2016; McEvoy, Wiles, Berhardsson, & Grimmer, 2017; Riska, Akin, Williams, Rouse, & Murnane, 2017).

As patient volume increased in emergency departments and wait times became longer, with more critically ill patients, the Agency for Healthcare Research and Quality (AHRQ) developed the Emergency Severity Index (ESI) to "prioritize incoming patients and to identify those who cannot wait to be seen" by a provider (Gilboy, Tanabe, Travers, & Rosenau, 2012, p. 1). Triage systems have been shown to facilitate and improve patient flow and decrease door to provider time for patients with higher acuity level at many different outpatient healthcare settings (Layton, Tovar, Wiggins, Rayens, & Salt, 2016). A triage system will help to identify the level of care needed and reduce wait time and length of stay (Hammad et. al., 2017; Harding, Taylor, & Leggat, 2011).

Significance

The significance of establishing a TAP is to reduce risk for patient adverse events (Harding, Taylor, & Leggat, 2011; Layton, Tovar, Wiggins, Ravens, & Salt, 2016). Patients with more urgent complaints should not have to wait long to be seen by a provider due to the increased risk for adverse events (CMPA, 2007). Literature has shown that long wait times to see a provider can be detrimental to patients with higher acuity complaints and abnormal vital signs (CMPA, 2007; Hart, Woodruff, & Joy, 2016; Mehmood et al., 2015; Nguyen et al., 2017). The most effective way to avoid these unforeseen events is to prevent them from happening in the first place by establishing a TAP.

The National Quality Forum (NQF) focuses on patient safety, timely, beneficial, patient-centered, equitable, and efficient care to reduce adverse events, whereas the Agency for Healthcare Research and Quality (AHRQ) and the Centers for Medicare and Medicaid Services ties these qualities to the billing codes, such as International Classification of Diseases (ICD) and Current Procedural Terminology (CPT) codes as a tool to help them classify, record, monitor, review, and reimburse the medical care provided by healthcare providers and healthcare clinics (Kizer, & Stegun, 2007). Furthermore, the Center for Medicare and Medicaid Services (CMS) have developed quality initiatives for the urgent care setting to improve patient outcomes and increase consumer satisfaction. The initiatives, reducing door to provider time in the urgent care and appropriate triage, has been tied with CMS reimbursement payment for the urgent care (Center for Medicare & Medicaid Services [CMS], 2014, p. 5). Differentials in payment reimbursement is based on the [clinic's] ability to "establish a reasonable, clinically-based method to distinguish emergency from non-emergency visits" (CMS, 2014, p. 6). The CMS system is unique in that it will provide payments based on the "most appropriate care delivered

in the most appropriate settings" (CMS, 2014, p. 7). Therefore, patients that require higher level of care, such as the emergency department will be a loss to urgent care due to lower payments regardless of providing more interventions and resources to stabilize the patient for transfer, and vice versa. Establishing a TAP to prioritize emergent from non-emergent visits will help to reduce costs for urgent care, and still improve patient healthcare outcomes.

This DNP project lead has received permission to implement an evidenced-based TAP to manage the patient volume in the urgent care setting, to determine the acuity level of these patients, and facilitate the patient flow accordingly to improve patient door to provider time; thus reducing patient adverse events.

Problem Statement

The current system utilized in the urgent care is a first-come, first-served system, which does not allow for prioritization of when a patient should be seen by a healthcare provider. Therefore, if a patient presents with a more urgent complaint, that individual will not have a higher priority to see the healthcare provider. This type of system is not effective if the patient has a high acuity chief complaint, such as chest pain, shortness of breath, or abdominal pain, or if they have abnormal vital signs.

The best intervention is to prevent any risk of patient adverse event and improve patient health outcomes by decreasing door to provider time using a TAP. Current research has shown that a triage system can improve healthcare outcomes, and is not only effective for emergency departments, but also is beneficial in improving patient flow and evaluating patient acuity levels in an outpatient urgent care setting (Gilboy, Tanabe, Travers, & Rosenau, 2012; Harding, Taylor, & Leggat, 2011; Layton, Tovar, Wiggins, Rayens, & Salt, 2016; Storm-Versloot, Vermeulen, van Lammeren, Luitse, & Goslings, 2014).

Purpose Statement

The aim of this DNP project is to implement an evidenced-based TAP in an urgent care setting in order to reduce door to provider wait times and improve evaluation and prioritization of patients based on the acuity of their health condition. Accurate and efficient triaging has been shown to "minimize wait times and optimize quality of care" (Reinhardt, 2017, p. 329).

Project Question and Objectives

In the general patient population, how will establishing an evidence-based TAP in an urgent care setting help to improve patient door to provider time to reduce risk for adverse events within four weeks of implementation? The following are the objectives for implementing an effective TAP within the timeframe of the DNP Project:

1. Implement an evidence-based TAP for the urgent care setting
2. Educate all staff on the new TAP
3. Implement and evaluate staff's knowledge and skills regarding the use of the TAP by a score of 90% or above on post-intervention case scenarios
4. Reduce overall door to provider wait time by 30%
5. Reduce door to provider wait time for patients with higher acuity complaints and/or abnormal vital signs by 50%
6. Reduce patient adverse events by 50%

Review Coverage and Justification

A literature search was performed to determine the importance of utilizing a TAP in an urgent care setting. The search engines used for the search included PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Google, UpToDate, and some intranet search. After hours of carefully researching, reviewing, analyzing, and re-evaluating the articles,

a total of 22 articles were found pertinent to this project. Six of these articles were related to abnormal vitals and the statistics for complications related to abnormal vitals. The rest of the articles were about length of stay, wait times, and the outcomes after implementing triage. Four of the articles addressed patient satisfaction. Nine were on triage in emergency departments and seven articles discussed triage and patient satisfaction in outpatient clinics, and three articles included adverse effects and risk for mortality. There were four articles specifically related to triage in urgent care. The key search terms used were “triage”, “triage in outpatient setting”, “triage in urgent care”, and “abnormal vitals”. Search limitations were English language, peer reviews, and date limitations from 2007 to 2018, to capture recent studies. The academic librarian also assisted with an intranet search, but it returned no results. A review of articles related to national quality improvement was also conducted in governmental affiliations such as the Center for Medical and Medicaid Services, National Quality Forum, and United States Department of Health and Human Services. Key terms used were “triage”, “triage protocol”, “triage protocol in outpatient clinic”, “triage protocol in urgent care”, and “abnormal vital signs”.

Inclusions and Exclusions

The literatures were reviewed for inclusions and exclusion criteria. The inclusions for the literatures had to discuss implementing TAPs in outpatient care settings, TAPs in emergency settings that addressed less emergent complaints, and TAPs that addressed abnormal vital signs, including TAPs in outpatient clinic settings in other countries, such as Canada, China, India, and Australia were acceptable. Excluded was literature that primarily focused on emergency settings only and emergency settings that did not include less emergent patient complaints, or patients with no documented vitals or incomplete vital signs. Abstracts alone were not included in the literature review. The themes that were extracted from the literature were: impact of triage,

reducing door to provider times, risk for hospital admissions, patient throughout, perceived barriers to implementation such as lack of staff, cost of the changes, lack of communications, level of education and skills, and adverse events, or near adverse events.

Review Synthesis

Many research works have been done to address the long patient door to provider wait times in the emergency department and outpatient patient care clinic, by using a triage system to better prioritize patients in seeing providers based on their acuity levels. The history of triage was trace back to France in the early 1800s when the original triage system was based on sorting surgical patients out in the battlefield (Robertson-Steel, 2006). Many centuries later, the early 1900's was when triage emerged into the hospital setting, specifically the emergency room, to assist in prioritizing patients based on their acuity level (2006). Recently, over the past ten years, triage is starting to be commonly use in outpatient setting as a strategy to reduce patient wait times for surgical procedures, or visits with specialties such as neurologist, orthopedics, rheumatologist, and other specialties (2006). Majority of the articles reviewed for this project has seen positive changes that occur with a triage system. Each triage system is different because it was developed to best fit into its own settings. A few articles took place in the hospital emergency department, but these articles would have to include their patient population with less emergent cases as well. The literature reviews primarily addressed in this paper will be on the outpatient clinic setting as the project is focus in an urgent care setting, which is also considered as outpatient clinic setting.

Impact of the Problem

Triage is a process that involves a brief explanation of the chief complaint and a complete set of vital signs, which is crucial in the determination of patient acuity level. Triage systems

have been implemented in many different healthcare settings in response to the need for quality improvement (McEvoy Wiles, Berhardsson, & Grimmer, 2017). Some urgent cares have an established system for patient prioritization and evaluation, whereas other clinics may not have that ability due to staff shortages, lack of provider experience, limited financial resources, lack of protocols or guidelines, or poor communication among the healthcare staff (Gardner et al., 2018; Lowth, 2015; Memmel, & Spalsbury, 2017). Whatever the reasons may be, the most significant concerns are patient prioritization based on chief complaints, patient presentation, and vital signs (Lowth, 2015; Reinhardt, 2017). Whether these issues are taken into consideration or not in the urgent care is often unknown; however, it is clear that the current prevailing system is a first-come, first-served protocol that is neither efficient nor effective in reducing door to provider time and preventing adverse events.

Reducing Door to Provider Times

Literatures have shown that some form of triage system in the outpatient setting has contributed to a decrease in patient wait times and improved door to provider time (Harding, Taylor, & Leggat, 2011). A spinal clinic used a comprehensive systematic approach and found a reduction in patient wait times to see the neurosurgeons and orthopedic surgeons after they established a triage screening by using professional skilled and experienced staff to conduct the triage (McEvoy, Wiles, Berhardsson, & Grimmer, 2017). In another study, a different method was used, the retrospective chart review method, but with a similar triage approach using skilled and experienced staff to conduct a triage screening on patients with benign paroxysmal positional vertigo (BPPV) and also found similar results, a reduction in wait times to see the neurologist (Riska, et al., 2017). A different approach was used in an outpatient surgery center, an ideal lean mapping triage system to prioritize patients based on the acuity of the surgery. In

this study, they also found a reduction in wait times for patients to have their surgeries (Valsangkar, Eppstein, Lawson, & Taylor, 2017). This study had the highest rating reliability and validity, given that it was repeated three times for approximately eight months for three consecutive years with the same results. In contrast, one retrospective review study by Harding, Taylor, and Leggat (2011) found that there were two cases out of the total of seven that revealed the triage system did not improve patient wait times. Overall, establishing a triage system to help prioritize patient acuity is crucial in reducing patient adverse events (Gardner et al., 2018). Literatures have shown that abnormal vital signs in triage is an indicator for risk of deterioration, hospital admissions, and death (Hart, Woodruff, & Joy, 2016; Mehmood et al., 2015; Nguyen et al., 2017).

Risk for Hospital Admissions

A TAP includes evaluation of the chief complaint and vital signs, which are the most important aspects of a triage process (Gilboy, Tanabe, Travers, & Rosenau, 2012). Good triage skills require "good assessments, communications, and risk management, and good clinical skills" to ensure that patients with the "greatest clinical needs are seen in a timely fashion" (Lowth, 2015. p. 46). Advanced age patients seen in an urgent care setting with abnormal vitals, such as borderline low blood pressure with systolic of 100-110 mmHg and high heart rates above 100, were found to have a higher risk for rapid deterioration, hospitalizations, and death (Hart, Woodruff, & Joy, 2016). Patients with abnormal vitals, in general, have a higher risk for hospital admission and death (Mehmood et al., 2015; Nguyen et al., 2017). In one study, the Manchester Triage system was used, and researchers found that "waiting time was better distributed over urgency levels" (Storm-Versloot, Vermeulen, van Lammeren, Luitse, & Goslings, 2014, p. 13). Another study found that "admission rates for patients with abnormal

vitals were two to four times higher among patients compared with patients who had normal vital signs" (Mehmood et al., 2015, par. 4). Furthermore, patients with abnormal vital signs prior to discharge have been shown to be at a higher risk for mortality and hospital readmissions within 30 days (Nguyen et al., 2017). Evidence has shown that triage in outpatient clinic settings has decreased door to provider wait times by prioritizing patient chief complaints, acuity levels, stability, and vital signs (Gardner et al., 2018; Hammad et al., 2017; McEvoy, Wiles, Berhardsson, & Grimmer, 2017; Reinhardt, 2017; Riska, et al., 2017; Slusar, Couban, & Shivakumar, 2017; Tucker, Clark, & Abraham, 2013).

Patient Throughput

Throughput is identified as the length of stay during the entire visit. Patient throughput can be delayed by multiple factors such as communication between patients and providers, and among providers and the staff (Gardner et al., 2018). Additional issues that can delay patient throughput are inefficiencies and workflow and delays in completing orders (Valsangkar, Eppstein, Lawson, & Taylor, 2017). Avoiding miscommunication about patient care among the providers and the nurses will increase quality care for the patients, and have been demonstrated through the process of using appropriate triage methods as an accurate way to prioritize the acuity level of patients' chief complaints and improve patient flow (Lowth, 2015). Disorganized patient throughput and flow in the department leads to patient overload in the clinic, contributing to long wait times (Zhu, Heng, & Teow, 2012). Simple tasks and miscommunications can lengthen the patient throughput time (2012). A study by Harding, Taylor, and Leggat (2011) used a systematic review approach to conduct a triage system combining triage and treatment approach at the beginning of triage to speed up the completion of simple interventions to improve patient flow in less emergent patients in the emergency department. This study found

there was an improvement in patient flow. Approximately over 20% of the patients were discharged in triage immediately after completion of the interventions and there was a reduction of approximately three hours in wait time to see providers (2011). During this project, the nurse and the provider were together in the room with the patient and the patient plan of care was directly and clearly communicated to the patient and the nurse, along with the interventions and discharge plans.

Barriers to Implementation

There are many barriers that can be discouraging in implementing changes. Grossman and Valiga (2009) stated barriers is the primary reason why most management try to avoid implementing changes. However, people with strong leaderships skills will not allow barriers to stop them from making improvements in achieving ones' goal (2009). The barriers focused for this project based on the articles were: staffing and communications, cost of the changes, and levels of education and training.

Staffing and communication. Implementing change requires preparation and motivation from the administration level down to the staff level. Some of the barriers to implementing changes is lack of staff, increase in costs, and lack of communication (Grossman, & Valiga, 2009; Lowth, 2015). In 2009, one of the Joint Commission's National Patient Safety Goals was to improve communications among care providers. According to Grossman and Valiga (2009), improvement in efficiency will improve healthcare outcomes and reduce costs. On many occasions, triage becomes inefficient due to poor resources and lack of staff to fill in the required positions and complete the task to make the system flow, and this can vary on a day-to-day basis (Harding, Taylor, & Leggat, 2011). One study found that the triage-to-provider time correlated with the number of nurses available during that shift, the time of day, and the number

of patients waiting (Reinhardt, 2017). Teamwork, even at the most basic level of skills, knowledge, and behaviors is found to have a higher chance of saving lives and improving patient outcomes if they communicated effectively (Curtis, 2014).

Cost of the changes. Implementing changes may sometimes involve financial investment. An example is increase in staff to complete the additional task, increase in hours for staff training, meetings, and education, and sometimes buying new equipment, tools, or other supplies needed to make the changes flow smoothly (Grossman, & Valiga, 2009). Surprisingly, the majority of articles used and reviewed for this project did not mention about any loss of finance to implement changes, with the exception of two articles by McEvoy, Wiles, Bernhardsson, and Grimmer (2015) and Riska et al. (2017) who mentioned no change in cost. In contrast, the study by Zhu, Heng, and Teow (2012) showed a reduction in staff overtime by 36%, which was a significant positive gain compared to the initial overtime percentage of 55%.

Levels of education and training. At any clinic or hospital, the staff members have different levels of education, training, and come from different backgrounds. In the clinical setting, there are staff who are medical assistants with six months of training and a certificate, then there are nurses with two or four years of nursing school with a state license after passing an intense state board (Harding, Taylor, & Leggatt, 2011; Lowth, 2015). These are two very different skills, knowledge base, and experiences. Staff with higher levels of training may be able to triage more effectively, which decreases a delay in the patient flow system (Harding, Taylor, & Leggatt, 2011). A study by Weber et al., (as cited in Reinhardt, 2017), found that "experience and knowledge levels of triages vary based on triage experiences" (p. 330). Some staff members lack the knowledge of policies, policies, protocols and procedures, patient assessment, understanding what is normal or abnormal, and the process for addressing higher

acuity levels (Lowth, 2015). In some occasions, other staff may be very new to the healthcare profession and do not know what process to follow is a patient presents with an acute complaint, or they may be uncomfortable caring for the higher acuity level patients (2015) given their lack of experience. Thus, it is important to evaluate staff education levels when preparing to implement changes (Gross, & Valiga, 2009).

Adverse Events and Near Adverse Events

The Office of Inspector General (OIG) of the U.S. Department of Health and Human Services and American Health Lawyers Association (AHLA) (2007) regulates patient safety and enforces penalties and fines for healthcare providers and healthcare businesses that have adverse events. The government requires near adverse events to be reported to the Joint Commission, which is the regulatory and monitoring body for sentinel events in the healthcare industry. The Center for Medical and Medicaid (CMS) is the center for financial reimbursement in healthcare and ties quality healthcare to reimbursements. Adverse events and near adverse events will result in loss of profit (Kizer, & Stegun, 2007). Reinhardt (2017) did an evaluation in a busy emergency department and found that the sentinel events that occurred at the facility were related to wait times while waiting to be triaged and delayed bed assignment, and most commonly occurred during high patient volumes. The best clinical practice is to avoid adverse or near adverse events. Urgent cares are not mandated by the state to be accredited by the Joint Commission; however, being accredited by the Joint Commission shows proof that the clinic follows the gold standard for safety and quality, which "enhances the appeal of an Urgent Care Center to payors and employers" (National Urgent Care Center Accreditation, n.d., par. 3). Joint Commission accreditation is also a quality initiative for urgent care in reimbursement from some major health insurances, not including Center for Medical and Medicaid (Joint Commission,

2009; Kizer, & Stegun, 2007). Furthermore, some health insurances require accreditation or certification before contracting with the clinics as a way to remain in-network (Urgent Care Association of America, 2018).

Addressing the Problem with Current Evidence

The Joint Commission reported that a best practice for healthcare clinics is to establish guidelines for expectations and measurements of patient outcomes (Shamji, Baier, Gravenstain, & Gardner, 2014). Many outpatient clinics have improved patient flow and decreased door to provider time by using a TAP to prioritize patients based on their complaints and vital signs (Gardner et al., 2018; Hammad et al., 2017; McEvoy, Wiles, Berhardsson, & Grimmer, 2017; Reinhardt, 2017; Riska et al., 2017; Slusar, Couban, & Shivakumar, 2017; Tucker, Clark, & Abraham, 2013). As patient volume increases in the urgent care setting, prioritizing patients to reduce risk for adverse events becomes a concern. Further evaluation of the current urgent care triage process and correlation with literature show that the following factors contribute to the efficacy of the triage process: a) use of a TAP; b) patient throughput; c) perceived barriers such as lack of staff, increase in costs, and lack of communications; d) adverse events or near adverse events; and e) levels of education and training.

Current Management

The current practice for outpatient clinics varies from clinic to clinic. Some clinics with patient volume overload strive to improve quality healthcare and initiate plans to prioritize their appointments based on a TAP they developed (Layton, Tovar, Wiggines, Rayens, & Salt, 2016; McEvoy, Wiles,Berhardsson, & Grimmer, 2017). Currently, a first-come, first-served system is used in the urgent care clinic that is the focus of this project. This system does not allow for prioritizing patients based on their chief complaints or vital signs and leads to concerns of patient

safety and risk for adverse events and is highly discouraged (Claudio, 2010; Marshall, Ogah, Lawson, Gibson, & Burge, 2017). In addition, there are currently no guidelines or protocols to address how patients are being evaluated on initial arrival, the department flow, and how to transfer patients to higher level of care if necessary. A first-come, first-served system will not be able to detect a deteriorating patient early enough to prevent adverse events.

Current Recommendations

With the rise of patient volume and increasingly long patient wait times in urgent care, including outpatient clinics, the current recommendation to improve quality healthcare outcomes and reduce patient adverse events is to establish a TAP that will best fit the services the clinic provides (Lowth, 2015). A TAP can be used in a variety of settings and not just in emergency departments. TAPs will help to prioritize patients based on acuity levels and chief complaints. There is a moderate level of evidence that exists to support establishing triage in outpatient and other healthcare settings to decrease door to provider time and improve patient flow in the clinic setting (Harding, Taylor, & Leggat, 2011; Reinhardt, 2017).

Issues Under Investigation

Although the triage system has been in use for many years, its effectiveness remains under continuous research for quality improvement. TAPs are established in many hospital settings, but it is still a new practice in outpatient settings; therefore, further research is necessary to systematically evaluate the relevance, and efficacy of outpatient triage processes (Gardner et al., 2018; Valsangkar, Eppstein, Lawson, & Taylor, 2017). Current investigation is focused on determining which triage process is proven to be more accurate in identifying patient acuity level and in improving patient door to provider time and patient flow (Moll, 2010). A study conducted by Christ, Grossman, Winter, Bingisser, and Platz (2010) compared the four different triage

systems: the Australian Triage Scale (ATS), the Canadian Triage and Acuity Scale (CTAS), the Manchester Triage System (MTS), and the Emergency Severity Index (ESI). In this study, they found the ESI triage system was the highest in validity and reliability. Other literature revealed that triage systems are developed by experts based on experiences and decisions by cases and are typically not validated (Crist et al., 2010).

Issues Not Yet Addressed

Current gaps in regards to TAP in the outpatient setting include: the efficiency and lack of data to prove that outpatient triage would benefit patients by reducing their time to see a provider (Cooper, & Green, 2013). There are significant gaps specifically related to urgent care due to lack of study data that is available.

Controversies

The Office of Inspector General (OIG) of the U.S. Department of Health and Human Services recommendation is to improve patient safety and healthcare outcomes and reduce costs. However, reimbursement has a cap and is based on patient complaint and the healthcare setting where the patients were seen (Center for Medical & Medicaid Services, 2014). Therefore, outpatient clinics such as urgent care will not be reimbursed for higher level interventions (2014). From a business aspect, this becomes a financial loss, which discourages urgent care clinics from making quality improvements when money is involved (Shamji, Baier, Gravenstein, & Gardner, 2014). The controversial issue stems from appropriate reimbursement. Outpatient clinics such as urgent care clinics should be appropriately reimbursed based on patient acuity levels and levels of interventions provided. However, clinics will only be reimbursed based on the appropriate care in the appropriate setting, which means that neither patients with a low acuity level seen in emergency, nor patients with a high acuity level see in urgent care, will

produce a high reimbursement (2014). Therefore, this TAP will include the transfer process to higher level of care such as the emergency department.

Significance and Implications for Nursing

Formation and development of a strong skilled and experienced staff can contribute to an effective triage system (Reinhardt, 2017). An efficient triage system can improve patient-to-provider time, improve patient flow, and provide an alternative option for outpatient clinical settings where high patient volumes and patient acuity needs to be taken into consideration for the benefit and safety of the patients to achieve quality healthcare outcome (Gardner et al, 2018; Harding, Taylor, & Leggat, 2011). This project is significant to the nursing profession because nurses can contribute to performance improvement that can increase quality of care; therefore, to achieve these contribution means implementing a systematic change that will identify the deficiencies, evaluate the problems, and develop a solution to resolve these problems. Improvement in quality healthcare requires continuous monitoring and changes to put patient safety first; concurrently, reducing healthcare cost and improving quality healthcare.

Conceptual Framework

The conceptual framework used to underpin this proposal and future DNP project is the Donabedian model. In the Donabedian model, the "conceptual framework focuses on three main categories: structure, process, and outcome" (as cited in Moran, Burson, & Conrad, 2014 p. 133). The project structure includes the setting where the project will be implemented and the people who will be implementing the project. The process consists of what the project will be doing and how the project will be delivered. The outcome will focus on what will be measured, reviewed, or assessed (See Appendix A for an overview of the diagram) (Moran, Burson, & Conrad, 2014).

Conceptual Model Identification and Historical Development

The Donabedian model was developed in 1966 by Avedis Donabedian, a physician and health service researcher at the University of Michigan (U.S. National Library of Medicine, 1998). Avedis created the Donabedian model after he started to work for the School of Public Health, where his focus was primarily on public health, teaching, and research. During those years, he realized there was no scale to measure the quality of medical care in the community; therefore, through his passion for research, he created the Donabedian model (Moore, Lavoie, Bourgeois, & Lapointe, 2015). His intent for the model was to assess quality healthcare and to guide improvements in structure that would lead to improvement in the clinical process, thus improving patient outcomes (2015).

This model is relevant to the nursing profession because nurses play significant roles throughout all three categories of the Donabedian model in providing quality care. Professional nursing practice involves specialized skills that are developed through years of educations and experiences. The nursing profession meets all three categories of the Donabedian model. Nurses, patients, and the ancillary staff are the structure, and the patient care they provide is the process. The outcome is the result of the quality nursing care they provide to the patients. The single most important recipe in the Donabedian model that Avedis mentioned is compassion, or simply caring (as cited by Rupp, 2018). Nurses are well reputable for these qualities that are not acknowledged by people in the other professions (American Hospital Association, 2018).

Applicability of Theory to Current Practice

Many organizations use the Donabedian model to measure quality improvement in a variety of settings. However, in a hospital setting quality improvement is used to demonstrate the positive outcomes to increase incentives for CMS reimbursement (Dimick, 2010). In the

Donabedian model, the organization is viewed as a whole or as one structure, and the process includes all of the work, tasks, or procedures involved in producing the outcomes. According to the Donabedian model, "quality measures should be developed with a sort of flow, keeping in mind the three prongs of the quality model" (2010, p. 36). To make this model work, there must be consistent flow with strong leadership, teamwork, communication, and organization. Dimick (2010) stated, "good organizational structure leads to improved processes, which lead to better patient outcomes" (p. 36).

Current practices using the Donabedian model is the Agency for Healthcare Research and Quality (AHRQ). AHRQ utilizes the Donabedian model when they implement quality measures in various healthcare settings. AHRQ views the system as a whole, even at a corporate level (Dimick, 2010). Although reporting quality measures is not mandated, it is an incentive to reimbursement and accreditation, and is also tied to reimbursement levels (2010). The Donabedian model is the closest method that meets the quality measurement used to evaluate care. Majority of the measures fall into the three categories of the Donabedian model: structure, process, and outcome. With electronic records, CMS ensures appropriate diagnosis are being made and appropriate treatment modalities are ordered. The last category is outcome, which measures the result of the entire process. Once again, healthcare information technology can extract these results easily for quality measurement.

The Donabedian model is applicable to the themes specifically focused on the urgent care, where the project will be conducted. The themes are: impact of triage, reducing door to provider time, risk for hospital admissions, patient throughput, staffing and miscommunication, adverse or near adverse events, and levels of education and skills.

Discussion of Major Tenets of the Theory

The Donabedian theory will best fit this project because it is "focused on the relationship between providers and patients and identified the setting of care or the structure of the organization and includes the processes that support the delivery of quality care" (Bemker, & Schreiner, 2016). In this theory, the major tenets are the three main categories: structure, process, outcome.

Structure

The first category is structure, which includes all the factors that affect the content in which the health care is being delivered. Basically, the structure is referring to the organization's available resources, which are utilized to run the clinic (Dimick, 2015). Examples of structure include the setting, the staff, the staff level of training and education, and the equipment and tools involved in the project (Moore, Lavoie, Bourgeois, and Lapointe, 2015).

Process

The second category is process, which is described as the actions or activities that complete the project (Moore, Lavoie, Bourgeois, & Lapointe, 2015). In the healthcare realm, it is usually referred to as the actual interventions, diagnostic tests, procedures, prevention care, treatment, and patient education. Each step in the Donabedian model is as equally important as the others; however, this step requires the most action and work because it involves ensuring timeliness and accuracy that relies on each person's ability to do their job appropriately (Dimick, 2015).

Outcome

The last category is the outcome, which is the end goal of the project (Moran, Burson, & Conrad, 2014). The outcome is "the consequences of a patient's interaction with the healthcare

system or the desired result" (Dimick, 2015, p. 35). In this case, the outcome would be the improvement in patient door to provider time by increasing the knowledge and skills of the staff with education, training, and leadership guidance.

Applications of Theory to Doctor of Nursing Practice Project

The Donabedian model can be applied to the Doctor of Nursing Practice project because the model is flexible and can be adapted to the type of setting, people, and situations involved in the project. This model can be applied to the current practice due to its focus on quality and its flexibility. Currently, there are no models or theories in place to guide practice at the urgent care. The Donabedian model is simple and well-suited for assessing and modifying structures and processes in small clinics like the urgent care setting where there is a diverse patient and staff population. The Donabedian model will be used to correlate all the connected factors to the implementation of the quality improvement project.

Structure

The structure classification in the project will include the clinic setting, the staff, and the space available to perform the triage process. The most important element for success will be ensuring there are sufficient resources to perform the next step (Dimick, 2015). The themes within the focus of structure are: facility and environment, technology and tools, and staff and patients.

Facility and environment. The facility and environment provide the space needed to perform patient care and associated activities. The urgent care has seven exam rooms and one trauma or procedure room. There is no room for triage. Currently, the patients are triaged in the exam room once they are called back into the room. The goal is to create a separate room specifically for triage.

Technology and tools. The technology and tools available can shape the efficiency of the system (Grossman, & Valiga, 2009). The urgent care has two vital sign machines and seven computers (used for charting). There are currently no communication tools between the providers and the nurses, but the administrators have recently approved the use of white boards. Therefore, the provider and nurses will use the white boards to communicate task completion. Each exam room will have a white board, which will list the interventions and plan of care so the patients will not get confused about what is expected next, and the nurses will know what task they have to complete.

Staff and the patients. There are two teams in the urgent care with alternating schedules. Each team consists of five medical assistants, one licensed vocational nurse, one registered nurse, one radiology technician, and two healthcare providers. One department manager runs the administrative duties, oversees all the medical assistants and nurses, one assistant director who oversees all the healthcare providers, and three physician partners who own the urgent care. The urgent care is open seven days a week, including holidays and weekends. Appropriate staffing to complete each task is crucial in this category. The patients who come to urgent care are diverse, and their ages can vary from newborn to adult to geriatric. Their medical complaints can vary from low acuity to high acuity.

Process

The process will include developing the TAP, educating and training staff to understand the proper use of the TAP, conducting triage, completing the interventions, notifying the healthcare providers immediately for higher acuity chief complaints and/or abnormal vital signs. At the process level, training and educating the staff to understand the triage process and utilize the TAP correctly is crucial. Time, quality education and valuable resources should be provided

and readily available for the staff (Grossman, & Valiga, 2009). The primary goal of conducting a TAP is to reduce door to provider time, decrease patient throughput time, transfer appropriate patients to a higher level of care facility as necessary to reduce risk for hospital admission, and improve healthcare outcomes. In the implementation of the protocol, it will be developed with consideration for structure, process, and outcomes.

Outcomes

The outcomes will be as follows:

1. Implement an evidence-based TAP for the urgent care setting.
2. Educate all staff on the new TAP.
3. Implement and evaluate staff's knowledge and skills regarding the use of the TAP by a score of 90% or above on post-intervention case scenarios.
4. Reduce overall door to provider wait time by 30%.
5. Reduce door to provider wait time for patients with higher acuity complaints and/or abnormal vital signs by 50%.
6. Reduce patient adverse events by 50%.

The outcomes will be measured using appropriate statistical testing to provide the scientific underpinning of this project. The outcomes include improved door to provider time, early identification and reduce wait time for patients with high acuity complaints, reduced adverse events or near events, and improve staff knowledge and skills to triage appropriately. Final data collection, statistical analysis, surveys, and comparison of results will be utilized to determine the success of the project.

Description of the Project Design

The aim of this DNP project is to implement an evidenced-based TAP in an urgent care setting in order to reduce door to provider wait times and improve evaluation and prioritization of patients based on

the acuity of their health condition. Accurate and efficient triaging has been shown to "minimize wait times and optimize quality of care" (Reinhardt, 2017, p. 329). This project design is utilizing a Quality Improvement (QI) approach by applying evidence-based methods to improve clinical and healthcare system outcomes. Triage accuracy and consistency is important to the establishment of an efficient TAP within urgent care or other healthcare settings (Hammad, Peng, Anikeeva, Arbon, Du, & Li, 2017). Staff training to understand the proper use of the TAP will be necessary. The quality improvement project will help to improve the current timeframes in the urgent care by: a) implementing an evidence-based TAP for the urgent care setting, b) educating all staff on the new TAP, c) implementing and evaluating staff's knowledge and skills regarding the use of the TAP by a score of 90% or above on post-intervention case scenarios, d) reducing overall door to provider wait time by 30%, e) reducing door to provider wait time for patients with higher acuity complaints and/or abnormal vital signs by 50%, and f) reducing patient adverse events by 50%. Overall, the primary goal is to utilized a TAP to reduce door to provider time for patients with higher acuity.

A project variable will be the different levels of education and training with the healthcare staff as there may be interpretation issues using the TAP. The data analysis method that will be used to examine this project variable is the pre and post exam questions. The pre-exam score before the training will help to determine how much time and education is needed to train the staff as a group. A data codebook will be utilized to maintain privacy of each staff.

The objectives will be measured using the Statistical Package for Social Science (SPSS) application. Statistical data will be retrieved from Practice Velocity (PV) database and then, those numbers will be inserted into the SPSS application to generate the report. Two different tests will be used to calculate the two samples. Wilcoxon Signed Rank test will be used to analyze the sample assessment of the staff's knowledge, and the Mann-Whitney U test will be used to analyze the door to provider times.

Population of Interest

The population of interest in this DNP project will include all healthcare professionals employed by the urgent care clinic, such as the physicians, advanced practitioners, nurses, medical assistants, radiology technicians, and registration clerks. The inclusions are all healthcare professionals who have completed their orientation and have direct patient contact. The exclusions are students in training at the clinic, and staff who have no direct patient contact such as the accounting department. In the entire office, there are a total of ten nurse practitioners and physician assistants, two physicians, four nurses, twelve medical assistants, six registration clerks, and four radiology technicians. The radiology technicians and registration clerks are not included in the implementation of the TAP since it is out of their scope of practice. The range of education varies from new graduates with no experience to more than fifteen years of experience in the healthcare field.

Setting

The setting is a community urgent care clinic serving the San Joaquin County patient population. This area has a population of approximately 700,000 throughout 90 cities, including approximately 300,000 in the Stockton area alone. The ethnicity census for year 2010 are as follows: 47% white, 12.5% African American, 22.9% Asian, and 32.2% Hispanic (Census, 2017). The United States Census Bureau (2017) reported an average median household income is $55, 045. Approximately 18% of the population have a Bachelor Degree or higher (Census, 2017). More than 10% of the residents are unemployed and more than 14% are classified as in poverty (Census, 2017). Overall, the residents of this area suffer from poor health due to lack of education and low rate of employment.

The urgent care in this community has seven exam rooms and one trauma room. The daily census for patient visits varies from as low as 60 patients per day to as much as over 100 patients per day. There is also another urgent care approximately 20 miles away. The complaints that come into the urgent care can vary from low acuity such as ingrown toenails, extremity injuries, allergy complaints, cough and cold symptoms, to high acuity such as chest pain, shortness of breath, abdominal pain, dizziness, and syncope. The urgent care has approximately 10-12 healthcare staff working on a daily basis. There are always two healthcare providers on duty each day. Sometimes the medical director will come into see patients as well. There are no financial gains or obligation involved. Prior to the implementation of this project, permission has been received from the project site administrator. (See Appendix B).

Stakeholders

The stakeholders are owners of the urgent care clinic, the medical director, administration, all the healthcare staff that work at the clinic, and all the patients that met the inclusion criteria and are present at urgent care to be evaluated. Stakeholders are interested in cost-effective projects that will save money, time, and provide efficient, safe healthcare management for patients, in addition to increasing patient volume and patient satisfaction. Update meetings will be held once every month with the administration team and then separately with the rest of the healthcare professionals. A weekly progress meeting be will conducted with the medical director of the clinic. Monthly staff meetings will also include update progress of the project. It is very important to develop a strong rapport and good communication with all the stakeholders as they play a significant role into the implementation and trial of this project (Butchibabu, Sparano-Huiban, Sonenberg, & Shah, 2016; Hall, & Roussel, 2017).

Recruitment Methods

This is a quality improvement project that will examine the urgent care metrics related to the door to provider times. This project is a systems wide practice change; that is supported by administration, therefore; the participation is mandatory. The participants are the staff, which is a convenience sample since they are already employed within the urgent care. During the timeframe of project implementation. The participants are expected to successfully complete all the education required and implement the new protocol. Any staff that does not meet this expectation will receive further training. Participation is a condition of employment.

Patient charts will also be recruited during the time of project implementation. Only charts that meet the inclusions will be utilize in this project. Chart review will be the four weeks before the implementation of the project and the four weeks during project implementation. Inclusions are the charts of all patients age 18 and over that have been seen in the urgent care four weeks prior and during the implementation phase. Exclusions are the charts of patients under age 18 and those patients that were seen in the urgent care two months and longer before implementation and those patients seen after implementation, including patients that have left against medical advice during the implementation phase.

Tools/Instrumentation

The main focus of this project is reducing door to provider to ensure that patients are seen in a timely manner. Tools and instrumentations that will be utilized in the evaluation of this project will include a computer system application that keeps track of the registration time, triage time, and provider-in time, a TAP containing a flow chart with low acuity and high acuity complaints based on the body systems, an educational presentation about use of the TAP, and a pre and post exam for the TAP training.

Computer System Application

The computer system application utilized to gather the data is Practice Velocity (PV). This is the computer system application that will take in the time the moment the patient is registered into the system. The time is started when the patient is registered into the computer by the clerk. The patient is then taken into a room where a set of vital signs is taken and asked for the chief complaint. If the vitals are abnormal or the chief complaints is high acuity, then the patient is roomed immediately and a provider will be notified immediately. If the vitals are normal and the chief complaint is low acuity then the patient can be sent back out to the lobby; however, if there is an exam room available then the patient will be escorted to a room for the provider to see. The timer stops when the provider goes into the room to evaluate the patient. This stop time is hand written in to the chart by the provider, which will later be manually entered into PV. The timeframe is measured in a 12-hour increment at the end of the day. The PV application can be set up to generate the report by the end of the day to extract the data. The computer system application PV will generate a report with the door to provider time by tracking down the start and stop times and generating the precise average numbers for the urgent care. The PV report will extract the door to provider times for the pre-implementation and post-implementation, then these numbers will be entered into SPSS to generate a final report.

Triage Algorithm Protocol

Using the Emergency Severity Index (ESI) developed by AHRQ, a TAP was developed. A TAP (See Appendix C) is a flowchart that helps healthcare staff to follow the process. The TAP contains a list of low and high acuity chief complaints based on the body systems with the abnormal vital signs. Abnormal vital sign parameters were set based on ESI by AHRQ (Gilboy, Tanabe, Travers, & Rosenau, 2012). The TAP will be a simple flowchart that all healthcare

professionals can easily follow to ensure the patient is being directed to the correct area to be evaluated by the healthcare providers in a timely manner.

Educational Presentation

There will be a brief educational presentation course that will teach the healthcare professionals how to utilize the TAP. It will be a PowerPoint slide presentation and will last approximately 30 minutes. This PowerPoint session will be presented during the mandatory meeting, which will be held 30 minutes before opening of the clinic. There will be a question and answer session. Example scenarios will be discussed after the educational presentation. The PowerPoint slide will cover how to understand and utilize the TAP. (See Appendix D)

Pre and Post Examination

There will also be a pre and post exam for the triage protocol. (See Appendix E). A pre and post exam for the TAP training will be a written test using a content validity index (CVI) tool to determine the relevance of the test questions to the project. The pre and post exam questions will be the same questions. The answers will not be discussed at all as all participants and their results are to remain confidential. A data codebook will be used to maintain confidentiality. The exam questions were written with a focus on the TAP. The exam questions will evaluate and analyze the staff's ability to apply concepts learned (Bristol, & Brett, 2015). There will be a total of 15 multiple-choice questions. Passing this exam requires at least a 90% or above. Rationales of the answers will also be provided if any staff wants to review their answers after taking the post exam. Providing rationale for every test question including references adds to the reliability and validity of the test (2015). Staff that do not have a passing score will receive a one-on-one training, then re-take the exam until they pass.

Content Validity Index

A CVI tool is used to determine the reliability and validity of the test as this is a new measuring scale (Polit, & Beck, 2006). Expert ratings of the CVI tool were utilized to determine its content relevance of the instrument (2006). The CVI procedure consists of having experts rate items on a four-point scale of relevance (2006). Each expert will have a rating form and give a rating. For each item, the item is computed as the number of experts giving a rating of three or four, divided by the number of experts (2006). The pre and post questions were created and evaluated, and determined to be valid by expert raters for inter-rater reliability. The expert panel were consist of doctorate-prepared expert nurses. The content validity index is calculated using the following formula:

CVR = [(E-(N/2)) / (N/2)] with E representing the number of judges who rated the item as **Moderately Relevant or Highly Relevant** and N being the total number of judges.

The mean total of all of the means of the questions will determine if the items are **moderately** or **highly relevant** based on the score. The CVI for the entire scale is one. The mean total varies from negative one to one. This means the closer the score is to a one, the more highly relevant the questions are applicable to the algorithm. The preferable score is to be as close as possible to one. The higher the score, the more highly relevant the questions are to the topic, meaning the test is valid and reliable (Polit, & Beck, 2006). (See Appendix F). There are three ways to calculate the CVI (2006). According to Polit and Beck (2006), first method averages the proportion of items rated relevant across experts. Second method averages the CVI by summing all the numbers and dividing by the number of items. The last method is to "count the total number of X's in the table – the number of items rated relevant by all experts combined then divide by the total number of ratings" (2006, p. 493). The results for all three methods will

always be exactly the same (2006). For this project, all three methods were calculated and all three results were 0.97, which means the validity of content is highly reliable.

Data Collection Procedures

The staff pre and post exam will be graded manually, then the results will be entered into the application called SPSS for calculation and generation of the final results. Both the pre and post exam will be given the same day. The pre-exam will be given before the education and training, then the post exam will be given after completion of the education and training. The results of both the pre and post exam will be extracted and then inputted into the SPSS application to determine the difference and comparison of the two scores. This result will determine the evaluation and efficacy of the education and training provided to the staff. This final result will determine the project outcome of evaluating the staff's knowledge and skills. A data codebook will be used to maintain confidentiality. A codebook maintains confidentiality by using numbers and letters to identify each staff. The staff will put their names on the exam, but during entry into the system theirs names will not be used, instead letters and numbers will be assigned to each staff and input into the data codebook. Afterwards, the exams with the staffs' name on it will be destroy into the confidential shredder bin to protect their privacy.

As for the door to provider time, the time averages will be abstracted from the PV system daily and at the end of the week. The data will be evaluated at the beginning of week one through end of week two since this project will be launched for two weeks. This information will be obtained by gathering the urgent care metrics for door to provider timeframe for each patient that is registered into the clinic. The numbers extracted for door to provider will be a four-week period before the implementation of the project, and then again during the four-week period during the implementation of the project. The data collected four weeks prior to

implementing the project and the four weeks during the implementation of the project will be compared in terms of the times for door to provider. These numbers will be inputted and stored into SPSS to later generate the final report. Final data for the project implementation will be collect during the last week to compile, organize, generate, and finalize the report. This final result will determine if there is a reduction in overall door to provider time.

To determine if there is a reduction in door to provider wait time for patients with higher acuity complaints and/or abnormal vital signs, will require a chart review. A chart review process will be completed for the four weeks before the implementation and during the four weeks of implementation for comparison. This process will occur pre-implementation immediately after the staff have been educated and it will also occur once the project ends. A chart audit tool will be utilized to extract the charts with the exact information necessary for the review. The chart audit tool will also include acuity level which will help to extract the charts for patients with higher acuity level. (See Appendix G). To maintain confidentiality, patients and providers initials will be used initially then reassigned to numbers and letters. Once these numbers are assigned and the data have been collected, the original chart audit tool sheet will be destroyed in the confidentiality shredder container. Information to extract that relates to this chart audit will include: patient initial, date of visit, time checked in, age, chief complaint, vital signs, time patient in the room, time seen by provider, interventions, outcome, disposition, and time of disposition. Only patients with abnormal vital signs and a high acuity complaint is included in this audit. Those with normal vital signs and low acuity complaints will be excluded from the chart audit. It will take approximately three to five days to review and gather the appropriate charts and input these data into SPSS to generate the final result. The final results will determine if there is a reduction in door to provider wait times for patients with higher

acuity and/or abnormal vital signs. Confidentiality will be maintained using a data codebook which is consist of letters and numbers assigned to each patient and the providers.

To determine the reduction for adverse events will also require a chart review. The same chart audit tool for the other sample will be utilized. (See Appendix G). The charts that will be pulled to evaluate for reduction in adverse events will be the charts belonging to patients that were transferred to a higher level of care by ambulance. These charts will be reviewed focusing on the check in time, door to provider time, and ambulance arrival time. A four-week period chart audit before implementation and a four-week period chart audit during implementation will also be reviewed to compare these times as well. The shorter the time for registration to ambulance arrival, the better the results. Once again, confidentiality will be maintained using a data codebook which is consist of letters and numbers assigned to each patient.

The above techniques is based on the assumption that an average of 50 to 60 patients will be seen daily both pre and post TAP implementation. Appropriate statistical testing will be utilized when analyzing the data. The consultation by a statistician provides reassurance that the statistical tests are appropriate for the objectives being measured.

Intervention/Project Timeline

The anticipated project timeline will be approximately eight weeks. During the last week, initiation of data collection, organizing, and compiling will also take place to generate, and conclude the final report. The door to provider timeframes in the urgent care clinic will be gathered four weeks before implementation of the project, then again four weeks during the implementation of the project, to evaluate and compare the timeframes pre and post the TAP.

The project timeline will be eight weeks. After the seventh week, the remaining week will be utilized to collect, compile, analyze, and prepare the report for dissemination to the instructors and colleagues. The project timeline will be as follows:

Week/Date	Activity
Week 1 November 6-11, 2018	• Chart audit initiated to collect pre-implementation data • Generate report from PV to collect pre-implementation data • Remind all participants of educational session date and time via email
Week 2 November 12-18, 2018	• Pre-examination administered to participants • Education session performed • Post-examination administered • Finalize pre-implementation data from chart audit and PV report
Week 3 November 19-25, 2018	• Re-train any participants that did not pass the exam • Participants to re-take exams if they did not pass initially, if everyone passes exam on first try, then prepare for implementation of the project.

	• Rearrange set up at the clinic in preparation for TAP • 1 day of Mock Trial for TAP implementation, date set for 11/21/2018 (before Thanksgiving)
Week 4 November 26, 2018 – December 2, 2018	• Collect, compile, and store Pre and Post Exam results into SPSS to generate a final report • Initiate TAP, first day 11/26/2018
Week 5 December 3-8, 2018	• Continue TAP • Monitor to ensure compliance with TAP and provide support • Data collected from PV daily and store into SPSS
Week 6 December 9-15, 2018	• Continue TAP • Monitor to ensure compliance with TAP and provide support • Continue to collect data from PV daily and store into SPSS
Week 7 December 16-22, 2018	• Continue to collect all data from PV and generate report in SPSS

	• Last week of TAP, last day of TAP 12/22/2018
Week 8 December 23-29, 2018	• Collect and analyze all data and report it in submitted assignments
Week 9 December 30, 2018 – January 05, 2019	• Prepare for dissemination to the stakeholders via presentation, handouts
Week 10 January 06-12, 2019	• Meet with stakeholders to disseminate project
Week 12 January 20-26, 2019	• Prepare to disseminate to course instructors and student colleagues
Week 14 February 03-09, 2019	• Disseminate project to the course instructors and student colleagues

Ethics and Human Subjects Protection

This is a quality improvement project. An institutional review board (IRB) determination form per TUN policy will be submitted; however, this project is likely to fall under the category of TUN quality improvement project which indicates an IRB review is not necessary. Completion of the CITI modules, which is an education program in protecting the human subjects from harm and keeping personal information confidential, has provided more knowledge about how to avoid patient identifiers or markers during the data collection process. The only data that will be extracted is related to the door to provider timeframes, the pre and post exam from the TAP training, measuring the time of transfers to a higher level of care, and

measuring of reduction in adverse events. All privacy and confidentiality of participant data are strictly maintained utilizing random letters and numbers to identify each participant. There are no risks to the participants, as well as no compensation to the participants. There is no IRB at the project site that will need to review this project prior to implementation.

Plans for Analysis/Evaluation

There will be four samples to measure in this project. The first sample is measuring the staffs, which includes the medical assistants, licensed vocational nurses, registered nurses, nurse practitioner, and physicians' assistants' knowledge and skills in the use of a TAP before and after triage protocol education in the form of a test. A Wilcoxon Signed Rank test will be the appropriate statistical test to use for the sample assessment of the staff's knowledge and skills. This will determine the outcomes for pre and post training of staff because it is designed for use with repeated measures; for example, when the participants are measured on two occasions, or under two different conditions (Pallant, 2016). The Wilcoxon Signed Rank test converts scores to ranks and compares them at Time 1 and Time 2 (Pallant, 2016). These scores will be gathered all at once during the mandatory monthly meeting. Once all the staff have been trained and the pre and post exams have been completed, then all the results will be inputted into SPSS to compile and generate the final report.

The second sample is for overall door to provider time. An independent sample T-test is the best approach since the test can check for a difference between two independent groups (Pallant, 2016). The T-test can compare median scores as it converts the scores on the continuous variable to rank across the two groups. Since patient flow is a variable because it can vary from a large amount to a small amount, in this case, as the scores are being converted to ranks, the actual distribution of the scores does not matter (Pallant, 2016). This data will be

gathered for four weeks during the implementation of the project, at the end of each week, then a report will be generated from PV. The numbers extracted from PV will be enter into SPSS to compile and generate the final report.

The third sample is to collect door to provider time for patients with higher acuity complaints and abnormal vitals. This sample will also need an independent sample T-test so it can check for the difference between two independent groups. Similarly, to the previous sample, the data will be gathered for four weeks during the implementation and at the end of each week to generate the report from PV.

The last sample is measuring the reduction in patient adverse events. This sample will also require an independent sample T-test. Data will be collected before and after the project implementation to generate a report. These data will be collected at the end of the project implementation and then compared to the pre-implementation data to generate the final report.

Significant/Implications for Nursing

The significance of the improvement in timeframes for door to provider will encourage and empower nurse leaders to continue to find new evidence-based strategies to improve accurate triaging to provide efficient quality patient care in the urgent care setting. The TAP will help the staff understand the importance of reducing door to provider times to improve quality care. By decreasing door to provider times, the urgent care clinic reduces mortality, improves efficiency and ensures no adverse events will occur (Christ et al., 2010). This quality improvement project will demonstrate to the clinic that there is room for improvement despite their resistance and struggles to new changes (Hall, & Roussell, 2017). It places the urgent care in compliance on a regulatory perspective with the reduce door to provider time initiative.

To the nursing profession, this project will demonstrate the benefits of having a structured approach to reduce triage time in any healthcare setting. The nurses will have a greater understanding of utilizing a structured triage protocol to improve wait time. They will be able to systematically prioritize rooming patients based on acuity level rather than on first-come, first-serve. This project will also teach the nurses that improvement is possible when there is teamwork and collaboration with one common goal (Grossman, & Valiga, 2009). From this experience, it is perceived that nursing leadership can improve quality patient care by translating current evidence into practice and contributing the body of knowledge with projects like this.

Analysis of Results

The evaluation of outcomes for this DNP project required statistical analyses with SPSS software to compare before and after results. Through this data analysis, the four objectives of this project will be addressed.

Pre and Post Exam

The Wilcoxon Signed Rank Test was used to calculate the pre and post exam data. Refer to Figure 1 and Figure 2 to see the pre and post scores. The pre-exam scores showed the results varied from 60% to 100%. The post-exam scores were above a 90%, which met the objective to score a 90% or higher on the post TAP exam.

Figure 1

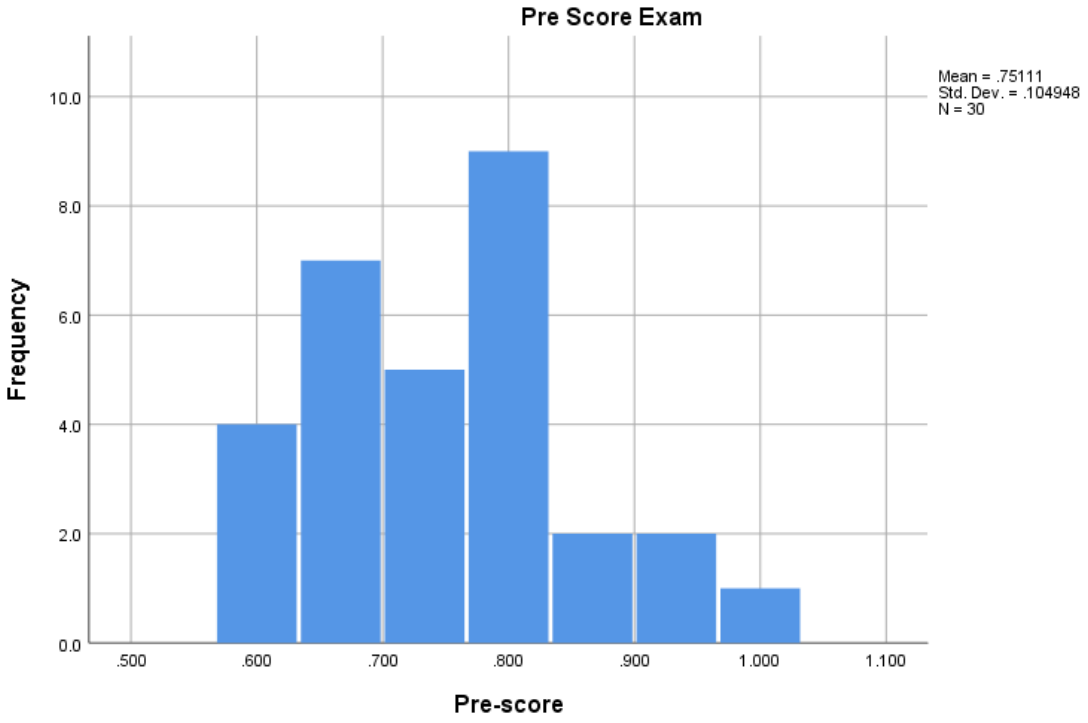
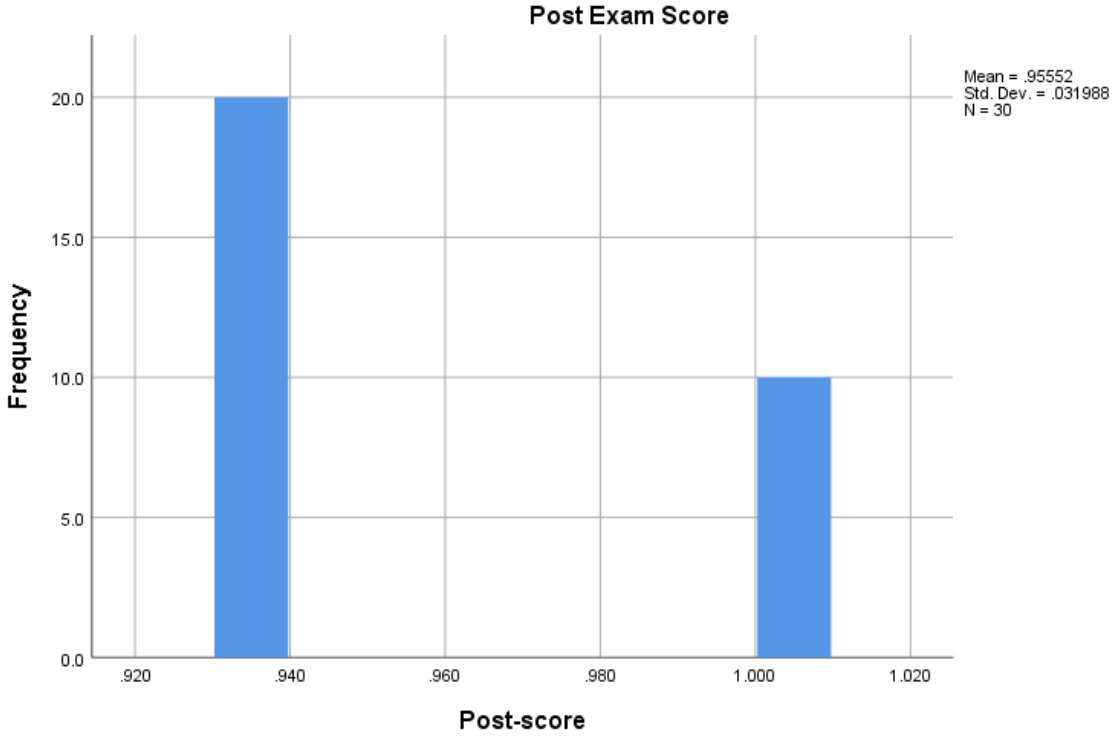


Figure 2

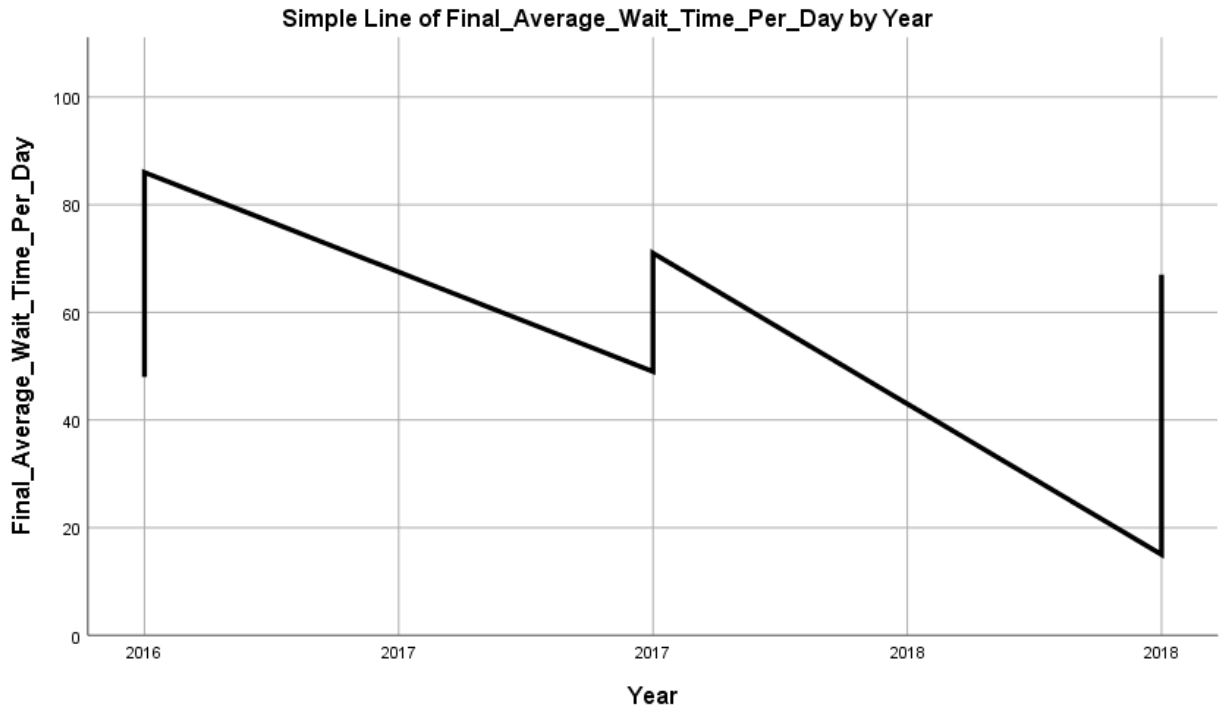


In table 1 (See Appendix H), the z-value and the associated significance levels presented in the test statistics are the most important values. If the significance level is equal to or less than .05 then it is concluded the difference between the two scores is statistically significant. In this sample, the significance value is .000 (which means it's less than .0005); therefore, we can conclude the two sets of scores are significantly different (Pallant, 2016). This means the urgent care staff has improved their knowledge skills assessments for triage. The staff understood how to utilize the triage algorithm correctly after the education and training.

Door to Provider Time

An independent sample t-test was used to determine the overall door to provider time. The overall average time a patient waited to be seen in minutes per day in 2017 was 60 minutes. (See Table 2, in Appendix H). For the year 2018, the average minutes a patient waited before project implementation was 53 minutes and after the project implementation, it was 26 minutes. This outcome was actually cut almost in half by 50%. This result validated the effectiveness of the TAP project in reducing overall door to provider time. This met and exceeded the objective to reduce overall door to provider wait time by 30%. (See Figure 3).

Figure 3



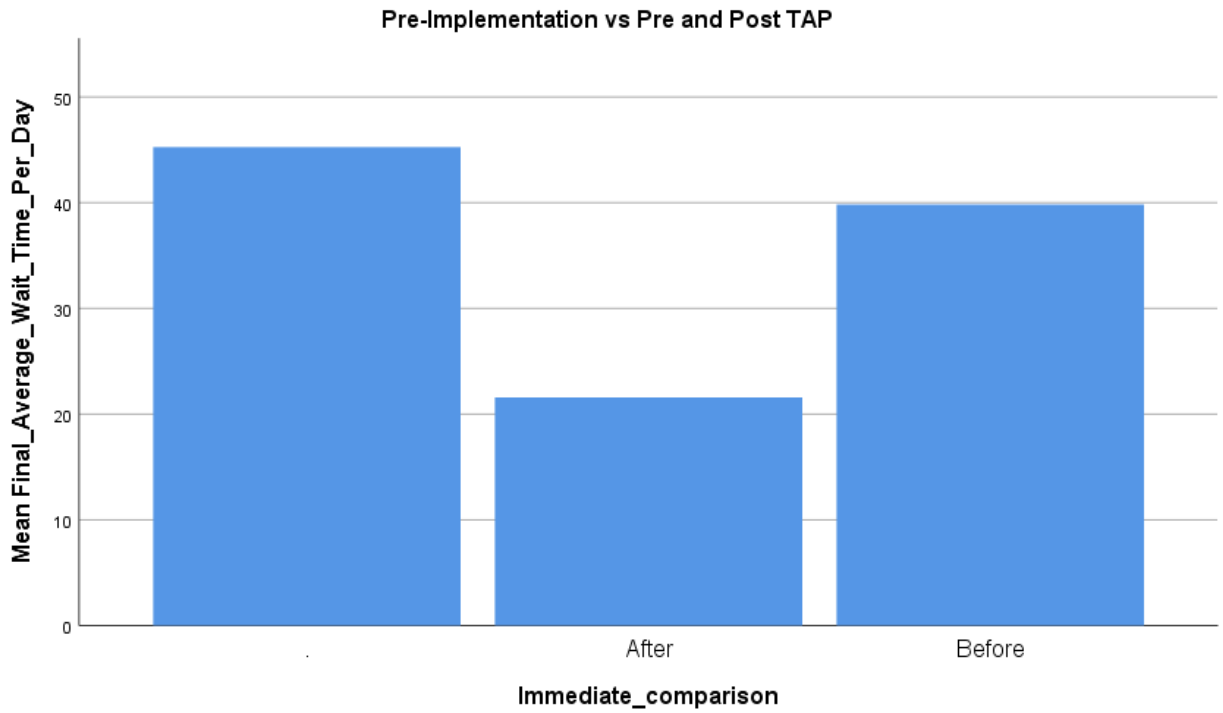
In Table 3, (See Appendix I) comparing the years 2016 through 2018 showed that in year 2016 the average door to provider time was 61 minutes, in year 2017 it was 59 minutes; in the year 2018, before project implementation it was 52 minutes. After the project implementation, the door to provider time was reduced to 26 minutes. Once again, the goal of reducing overall door to provider wait time by more than 30% has been achieved.

Door to Provider Time High Acuity

An independent sample T-test with the Levene's test was used to determine door to provider time for patients with high acuity. (See Appendix I and J). The Levene's test was also used in combination with the T-test to determine the significance of the findings. Based on the statistics, the significance value for Levene's test is less than .05; therefore, there was a violation of assumption, so the information in the second line of the t-test table was used, which is refer to as the "equal variance not assumed". The significance (2-tailed) value under "equal variance not

assumed" is less than .05, which means there is a significant difference in the mean scores (Pallant, 2016). Although there is a significant difference in the mean score based on the t-test, the goal was to reduce door to provider time by 50% for higher acuity. This goal was not met when comparing this year to last year. The goal for reducing door to provider time in high acuity patients only reached 40% reduction when compared to the rates in 2017. This outcome obviously does not meet the objective of the project which was 50%. (See Figure 4).

Figure 4



Tables 6 and 7 (See Appendix J and K) are another example to compare average wait time per year. Table 6 compared all three years from 2016 through 2018. Table 7 compared the current year 2018; before project implementation time was 39.82 minutes and after project implementation time was 21.57. It is clear the goal to reduce door to provider wait time for

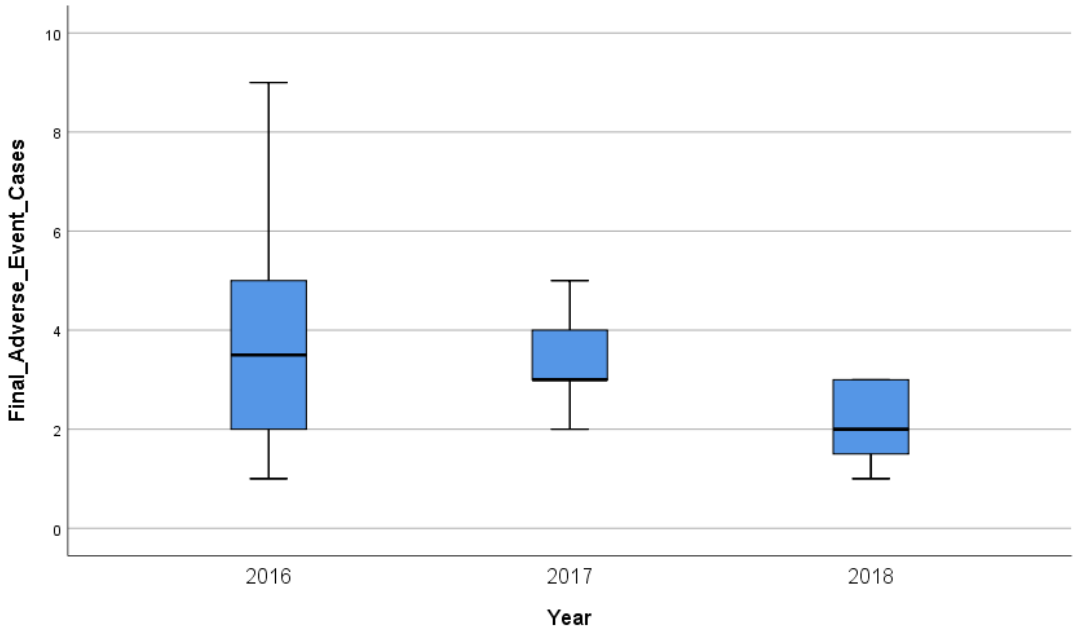
patients with higher acuity complaints and/or abnormal vital signs by 50%, was not met; the final outcome reduced door to provider time for patients with high acuity was 48%.

Adverse Events

Comparing the number of cases of patients experiencing adverse events in the waiting room from the year 2016 through to 2018, there is significant downtrend of adverse event cases. (See Table 8 in Appendix L). In the year 2016, the least amount of cases reported per month while patients were waiting in the lobby was one case and the most cases reported per month was nine cases with an average of 3.75 cases per month for the entire year. In year 2017, the least amount of cases reported was two cases per month and maximum amount of cases reported per month was five cases with an average of 3.33 per month for the entire year. In 2018, the average reported cases per month was 2.08 for the year, with a minimum of one case per month and maximum of three cases per month. These downtrend numbers were suspected due to various factors, such as different levels of experience for the healthcare providers, a variety of acuity levels, decrease patient volume, and increase healthcare provider on duty.

As in Figure 5, the boxplot showed the trend within the past three years. The median value did not change much. In 2017, the median value for year 2016 was 3.5 cases and for 2017 it was three cases. In 2018, there were two cases. The boxplot did not have whiskers protruding out to larger values so this means there is more consistency without outliers for the year 2018.

Figure 5



In Table 9 and Table 10 (See Appendix M), an independent sample t-test was used to analyze the statistics for adverse events. When comparing year 2017 to year 2018, the mean for 2017 is 3.33 cases and for 2018 it is 2.08 cases. Based on the statistics, significance value for Levene's test is more than .05; therefore, there was no violation of assumption, so the information in the first line of the t-test table was utilized, which is referred to as the "equal variance assumed". The significance (2-tailed) value under equal variance assumed is less than .05, which means there is a significant difference in the mean scores. The 95% confidence interval of the difference is .49 on the lower end and over two on the higher end. The significance (2-tailed) value under "equal variance assumed" is less than .05, which means there is a significant difference in the mean scores. However, in the prior year of 2017, the average adverse cases reported was 3.33; therefore, to meet the objective of the project, the reported

adverse cases for 2018 would have to be one case per month, but in this project, it was an average of two cases reported after project implementation. Overall, the objective of the project was not met as it did not meet the reduction of 50% for adverse events.

The four objective questions were answered. The urgent care staff have improved their knowledge skill assessments for triage after TAP training, and there were significant changes in the overall time for door to provider and for patients with higher acuity, including a reduction in adverse event cases.

Discussion

The overall data indicated the TAP project had significant impact on reduction of door to provider time for patients regardless of chief complaints. The pre and post exam score of the staff correlates with the positive reflection in the number of adverse event cases. This could be due to various reasons such as increase in staff knowledge after education provided, healthcare providers with more experience, improved staffing, increase in patient volume, higher patient acuity level. The outcome of the TAP project was a decline in adverse event cases once the door to provider time was shortened. Establishing an effective triage system to help prioritize patient acuity is crucial in reducing patient adverse events (Gardner et al., 2018). Decrease door to provider time and a reduction in patient crowding has been shown to have better outcomes (Carter, Pouch, & Larson, 2013).

Overall, out of the four objectives, two were met. The two objectives met were: 1) staff scored above 90% on the post exam after the TAP education was implemented, and 2) the overall door to provider time was reduced to 50% or less. The other two objectives were not met even though the signature value showed a significant change. These two unmet objectives were 1) reduction of door to provider wait time for patients with higher acuity complaints and/or

abnormal vital signs by 50%, and 2) reduction in patient adverse by 50%. The reason for this was that it did not reach the 50% reduction for time to provider for high acuity and it did not reduce adverse event cases by 50%, as initially set at the beginning of this project. It appears that the objective of 50% was set too high; therefore, even when there was a significant change with the TAP, the goals were still unmet.

In the end, the project outcome did align with the current literature. It is proven that utilizing a triage system can improve patient flow and decrease door to provider time in the outpatient setting (Gilboy, Tanabe, Travers, & Rosenau, 2012; Harding, Taylor, & Leggat, 2011; Layton, Tovar, Wiggins, Rayens, & Salt, 2016; Storm-Versloot, Vermeulen, van Lammeren, Luitse, & Goslings, 2014).

Significance for Nursing

The significance of this project for nursing is to understand that improvement in patient care is a continuous process. Nurse leaders will need to be open-minded to new ideas, new research, and continue to seek new strategies to improve quality patient care. A great nurse leader will have big visions to improve quality patient care and lead it to the next generation of innovative healthcare. Nurse leaders will aim for safety as their priority goal by developing a vision to decrease door to provider time and improve patient flow within the department, to reduce overall patient adverse events and improve safety of the patients and staff.

Limitations

The main limitation of the project design was the brief timeframe of the project. The short timeframe was insufficient to really determine the total amount of adverse event cases in one full month. The data collection limitation was the small sample size to measure adverse events, which may have limited the ability to detect the statistically significant data. The

recruitment limitation was the inconsistency of adequate staffing. Some days the clinic was appropriately staffed and other days there were a lack of staff to run the TAP efficiently. On days when the clinic was short staffed, the patient rooming was delayed, which also cause a delayed in door to provider time. The analysis limitation was the time notation from when the patients were seen by the providers as these times were manually entered by the ancillary staff or nurses, which can also result in the possibility of inaccurate time notation for door to provider.

Dissemination and Sustainability

This project will be disseminated at two different areas. One dissemination will be on-line at dnpprojects.org. This dissemination on-line is also part of the requirement for the DNP Program at Touro University. The second dissemination will be a poster board presentation at an Urgent Care Association Convention, specifically at an upcoming event this year in April from the 7th through the 10th. This event will be held in West Palm Beach, Florida, at the Palm Beach County Convention Center.

This project will be sustainable within the practice site because the staff are currently utilizing the TAP and the administrations are using the monthly numbers to determine the productivity and door to provider time as room for growth for the healthcare providers and staff. The TAP only requires having adequate staffing to facilitate the process and flow of the department. Furthermore, the TAP protocol can be transferable to other urgent care settings. As a result of this project, this TAP will become policy for another urgent care clinic and will be utilized at that setting as a protocol and a teaching tool for all the staff at the clinic.

Conclusion

Overall, the skills of prioritization, organization, and team work were able to make a difference in reducing patient adverse events by decreasing door to provider time. The use of an

organized well-developed method can contribute to significant improvement in patient care. The urgent care clinic initiated the urgency for change and highlighted the importance of implementing a plan to improve patient safety and reduce patient adverse events. Developing a Triage Algorithm Protocol was successful to facilitate a shorter door to provider time, prioritize patients based on acuity level, and build a smoother patient flow. Formulating a vision and implementing the changes, allowed others and leadership in the department to see the change, accept the change and empower others to continue seeking better strategies to improve patient safety.

References

American Hospital Association. (2018, January 10). Nurse watch: Nurses again top gallup poll of trusted Professions and other nurse news. Retrieved from https://www.aha.org/news/insights-and-analysis/2018-01-10-nurse-watch-nurses-again-top-gallup-poll-trusted-professions

Bemker, M., & Schreiner, B. (Eds). (2016). The DNP degree & capstone project: A practical guide. Lancaster, PA: Destech Publishing.

Bristol, T., & Liners, A. (2015). Test item writing: 3Cs for successful tests. *Teaching and Learning in Nursing, 10*, 100-103. Retrieved from http://dx.doi.org/10.1016/j.teln.2015.01.004

Butchibabu, A., Sparano-Huiban, C., Sonenberg, L., & Shah, J. (2016). Implicit coordination Strategies for effective team communication. *Human, 58*(4), 595-610. Retrieved from http://dx.doi.org.lb-proxy2.touro.edu/10.1177/0018720816639712

Canadian Medical Protective Association. (2007). Wait times a medical liability perspective. Retrieved from www.cmpa-acpm.ca

Carter, E. J., Pouch, S. M., & Larson, E. L. (2013). The relationship between emergency Department crowding and patient outcomes: A systematic review. *Journal of Nursing Scholarship, 46*(2), 106-115. Retrieved from https://doi.org/10.1111/jnu/12055

Census. (2017). QuickFacts San Joaquin County, California. United States Census Bureaus. Retrieved from https://www.census.gov/

Center for Medical & Medicaid Services. (2014). Reducing nonurgent use of emergency Departments and improving appropriate care in appropriate settings. Department of

Health and Human Services. Retrieved from https://www.medicaid.gov/Federal-Policy-Guidance/Downloads/CIB-01-16-14.pdf

Chelluri, L. P. (2008). Quality and performance improvement in critical care. *Indian Journal of Critical Care Medicine, 12*(2), 67-76. doi: 10.4103/0972-5229.42560

Christ, M., Grossman, F., Winter, D., Bingisser, R. & Platz, E. (2010). Modern triage in the emergency department. *Deutsches Arzteblatt International, 107*(50), 892-898. doi: 10.3238/arztebl.2010.0892

Claudio, D. (2010). Dynamic vitals monitoring for patient prioritization in the emergency department: A technology enabled utility approach (Doctoral dissertation). Retrieved from Pennsylvania State University. (109863895)

Cooper, R. J., & Green, S. M. (2013). Don't hyperventilate over triage respiratory rates. *Annals of Emergency Medicine, 61,* 44-45. Retrieved from https://doi.org/10.1016/j.annemergmed.2012.07.007

Curtis, M. (2014). Importance of good teamwork in urgent care services. *Emergency Nurse, 22*(7), 32-36. Retrieved from http://dx.doi.org.lb-proxy2.touro.edu/10.7748/en.22.7.32.e1312

Dimick, C. (2010). "Quality check: An overview of quality measures and their uses. *Journal of AHIMA, 81*(9), 34-38. Retrieved from http://www.ahima.org/

Gardner, R. M., Friedman, N. A., Carlson, M., Bradham, T. S., & Barrett, T. W. (2018). Impact of revised triage to improve throughout in an ED with limited traditional fast track population. *American Journals of Emergency Medicine, 36,* 124-127. Retrieved from https://doi.org/10.1010/j.ajem.2017.10.016

Gilboy, N., Tanabe, P., Travers, D., & Rosenau, A. M. (2012). *Emergency Severity Index*

[ESI]: A triage tool for emergency department care (4th ed.). Agency for Healthcare Research and Quality. Retrieved from www.ahrq.gov.

Grossman, S. C. & Valiga, T. M. (2009). *The new leadership challenge: Creating the future of Nursing* (3rd ed.). Philadelphia, PA: F.A. Davis.

Hall, H. R., & Roussel, L. A. (2017). *Evidence-Based Practice: An Integrative Approach to Research, Administration, and Practice.* (2nd ed.). Burlington, MA: Jones & Bartlett Learning.

Hammad, K., Peng, L., Anikeeva, O., Arbon, P., Du, H., & Li, Y. (2017). Emergency nurses' Knowledge and experience with the triage process in Hunan Province, China. *International Emergency Nursing, 35,* 25-29. Retrieved from http://dx.doi.org/10.1016/j.ienj.2017.05.007

Harding, K. E., Taylor, N. F., & Leggat, S. G. (2011). Do triage systems in healthcare improve patient flow? A systematic review of the literature. *Australian Health Review, 35*, 371-383.

Hart, J., Woodruff, M., & Joy, E. (2016). Association of age, systolic blood pressure, and heart rate with adult morbidity and mortality after urgent care visits. *Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health, 17*(5), 591-599. doi: 10.5811/westjem.2016.6.30353.

Joint Commission of Accreditation of Healthcare Organizations (2009). *Comprehensive Accreditation Manual for Ambulatory Care 2009*. Retrieved from www.jointcommission.org

Kizer, K. W., & Stegun, M. B. (2007). Serious reportable adverse events in health care. *Advances in Patient Safety, 4,* 339-352.

Layton, K., Tovar, E., Wiggins, A. T., Rayens, M. K., & Salt, E. (2016). Evaluation of a rheumatology patient prioritization triage system. *Journal of American Association of Nurse Practitioner, 28*(10), 541-545. doi: 10.1002/2327-6924.12367

Lowth, M. (2015). Using triage to manage demand in practice. *Practice Nurse, 45*(6), 44-48.

Marshall, E. G., Ogah, I., Lawson, B., Gibson, R. J., & Burge, F. (2015). 'Meet and greet' intake appointments in primary care: A new pattern of patient intakes? *Family Practice, 34*(6), 697-701. Retrieved from http://dx.doi.org.lb-proxy2.touro.edu/10.1093/fampra/cmx043

McEvoy, C., Wiles, L., Berhardsson, S., & Grimmer, K. (2017). Triage for patients with spinal complaints: A systematic review of the literature. *Physiotherapy Research International, 22*(1), e1639. doi: 10.1002/pri.1639

Mehmood, A., He, S., Zafar, W., Baig, N., Sumalani, F. A., & Razzak, J. A. (2015). How vitals are the vital signs? A multi-center observational study from emergency departments of Pakistan. *BMC Emergency Medicine, 15*(Suppl 2). Retrieved from https://doi.org/10.1186/1471-227X-15-S2-S10

Memmel, J. & Spalsbury, M. (2017). Urgent care medicine and the role of the APP within this specialty. *Disease-a-Month, 63,* 105-114. Retrieved from http://dx.doi.org/10.1016/j.disamonth.2017.03.001

Moll, H. A. (2010). Challenges in the validation of triage systems at emergency department. *Journal of Clinical Epidemiology, 63*(4), 345-470. doi: https://doi.org/10.1016/j.jclinepi.2009.07.009

Moore, L., Lavoie, A., Bourgeois, G., Lapointe, J. (2015). Donabedian's structure-process-

outcome quality care of model: Validation in an integrated trauma system. *Journal of Trauma Acute Care Surgery, 78*(6), 1168-1175. doi: 10.1097/TA.0000000000000663.

Munjal, K. G., Belachew, A., Tan, N., Morrison, J., Kong, C., Drake, A. B., Chapin, H., Redlener, M., Ming, K., Ngai, G., Fierstein, J., & Richardson, L. (2015). Retrospective application of a low acuity emergency medical services triage protocol to identify patients appropriate for urgent care. *Annals of Emergency Medicine, 66*(48), S48. Retrieved from https://doi.org/10.1016/j.annemergmed.2015.07.168

Nguyen, O. K., Makam, A. N., Clark, C., Zhang, S., Xie, B., Velasco, F., Amarasingham, R., & Halm, E. A. (2017). Vital signs are still vital: Instability on discharge and the risk of post-discharge adverse outcomes. *Journal of General Internal Medicine, 32*(1), 42-28.

Office of Inspector General [OIG] of the U.S. Department of Health and Human Services. (2007). Corporate responsibility and health care quality: A resource for health care boards of directors. Retrieved from https://oig.hhs.gov/fraud/docs/complianceguidance/Corporate%20Responsibility%20and%20Health%20Care%20Quality%206-29-07.pdf

O'Keeffe, C., Mason, S., Jacques, R., & Nicholl, J. (2018). Characterising non-urgent users of emergency department (ED): A retrospective analysis of routine ED data. *Plos One Journal, 13*(2). doi: 10.1371/journal.pone.0192855

Pallant, J. (2016). Statistical Package for Social Science (SPSS). Survival Manual. A Step by step Guide to Data Analysis Using IBM SPSS. (6TH ed.). New York, NY. McGraw Hill Education.

Polit, D. F., & Beck, C. T. (2006). The content validity index: Are you sure you know what's

Being reported? Critique and recommendations. *Research in Nursing & Health, 29,* 489-497. doi: 10.1002/nur.20147

Reinhardt, M. R. (2017). A systematic approach to evaluation of performance deficiencies in ED Triage. *Journal of Emergency Nursing, 43*(4), 329-332.

Riska, K. M., Akin, F. W., Williams, L., Rouse, S. B., & Murnane, O. D. (2017). A benign Paroxysmal positional vertigo triage clinic. *American Journal of Audiology, 26,* 481-485. Retrieved from https://doi.org/10.1044/2017_AJA-16-0119

Robertson-Steel, L. (2006). Evolution of triage systems. *Emergency Medicine Journal, 23*(2). doi: 10.1136/emj.2005.030270

Rupp, M. T. (2018). Assessing quality of care in pharmacy: Remembering Donabedian. *Journal of Managed Care and Specialty Pharmacy, 24*(4), 354-356. Retrieved from https://doi.org/10.18553/jmcp.2018.24.4.354

Shamji, H., Baier, R. R., Gravenstein, S., & Gardner, R. L. (2014). Improving the quality of care and communication during patient transitions: Best practices for urgent care centers. *The Joint Commission Journal on Quality and Patient Safety, 40*(7). Retrieved from https://www.jointcommission.org/assets/1/18/Coord_of_Care_JQPS0714.pdf

Slusar, J., Couban, S., & Shivakumar, S. P. (2017). Evaluation of a novel strategy of triage in the haematology ambulatory care setting. *Journal of Evaluation in Clinical Practice, 23*(2), 340-343. doi: 10.1111/jep.12616

Storm-Versloot, M. N., Vermeulen, H., van Lammeren, N., Luitse, J. S., & Goslings, J. C. (2014). Influence of the Manchester triage system on waiting time, treatment time, length of stay and patient satisfaction; a before and after study. *Emergency Medicine, 31,* 13-18. doi: 10.1136/emermed-2012-201099

Tucker, G., Clark, N. K., & Abraham, I. (2013). Enhancing ED triage to accommodate the special needs of geriatric patients. *Journal of Emergency Nursing, 39*(3), 309-314. Retrieved from http://dx.doi.org/10.1016/j.jen.2010.07.007

United States National Library of Medicine (1998, April 16). History of health services research project interview with Avedis Donabedian. Retrieved from https://www.nlm.nih.gov/hmd/nichsr/donabedian.html

Urgent Care Association of America (2018). Accreditation and Certification. Retrieved from http://www.ucaoa.org/?CertAccred

Valsangkar, N. P., Eppstein, A. C., Lawson, R. A., & Taylor, A. N. (2017). Effect of lean Processes on surgical wait times and efficiency in a tertiary care veterans affairs medical center. *Journal of American Medical Association, 152*(1), 42-47. doi: 10.1001/jamasurg.2016.2808

Zhu, Z., Heng, B. H., & Teow, K. L. (2012). Analysis of factors causing long patient wait times and clinic overtime in outpatient clinics. *Journal of Medical Systems, 36*, 707-713. doi: 10.1007/s1096-010-9538-4

Appendix A

Donabedian Model

Structure → → → → Process → → → → Outcomes of Care

(Inputs)	(Steps)	(Outputs)
• Patients • Staff • Equipment • Supplies • Training • Environment	• Coordination • Provider orders • Nursing responsibilities • Tasks completion • Data collection • Patient throughput • Communications • Education	• Improve clinical outcomes • Reduce overall patient wait time by decreasing door to provider time • Reduce door to provider wait time for patients with higher acuity complaints and/or abnormal vital signs • Reduce adverse or near adverse events • Reduce time to transport to higher level of care • Increase staff knowledge and skills

Appendix B

Permission Letter to Conduct Project

Clinical Agreement

Purpose of Project: Reduce patient adverse events by implementing triage in an Urgent Care setting to improve door-to-provider time.

Clinical agreement not needed. Nhia has permission to conduct her project at the listed clinic below.

Clinic: Trinity Urgent Care

Address: 10200 Trinity Parkway, Stockton, CA

Ayan Mohamud Date 03-13-18

Printed Name of Person in Charge of Supporting Student in this Project

Date 03-13-18

Signature of Person in Charge of Supporting Student in this Project

Nhia Yang Date 03-13-18

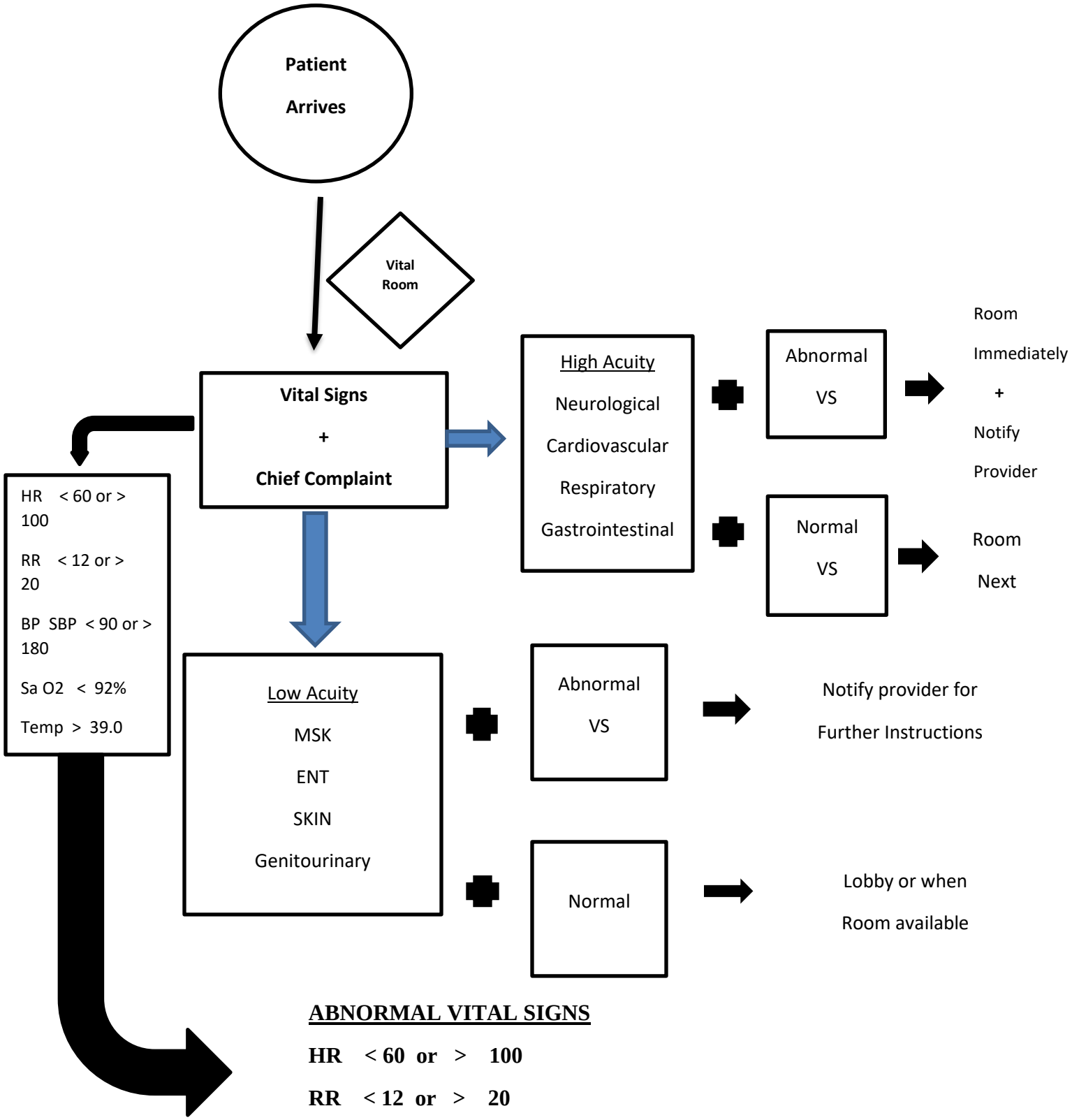
Printed Name of Student Conducting Project

Date 03-13-18

Signature of Student Conducting Project

Appendix C

Triage Algorithm Protocol



ABNORMAL VITAL SIGNS

HR < 60 or > 100

RR < 12 or > 20

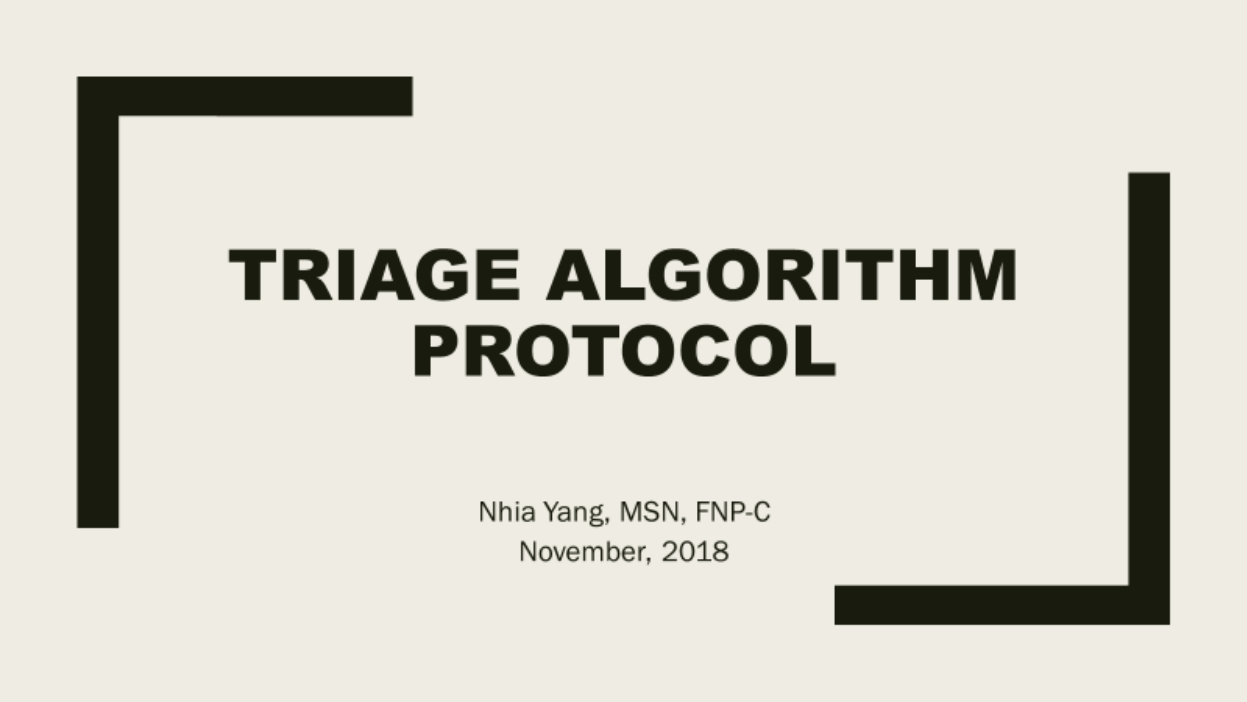
BP SBP < 90 or > 180

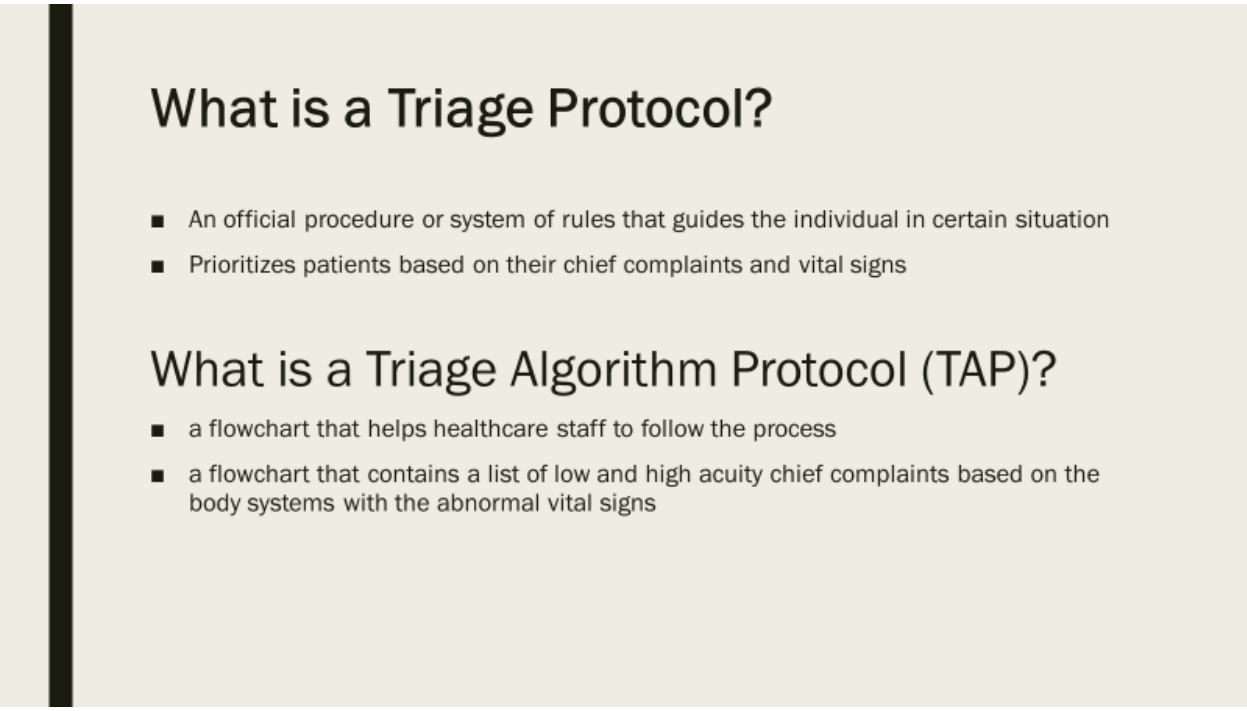
Sa O2 < 92%

Temp > 39.0

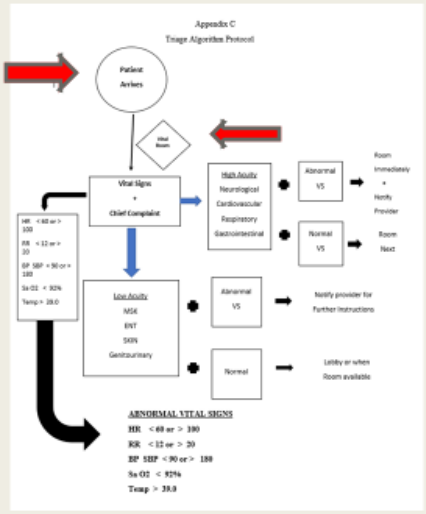
Appendix D

Educational Presentation for Triage Algorithm Protocol





FlowChart Diagram

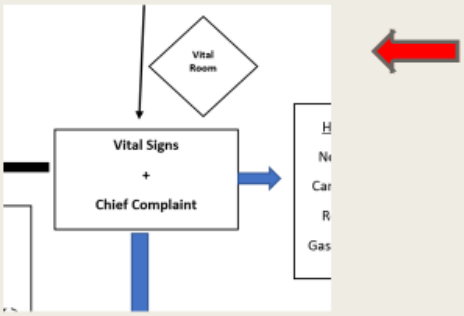


FlowChart

Step 1. Patient arrives – registration then sits down in lobby to wait

FlowChart

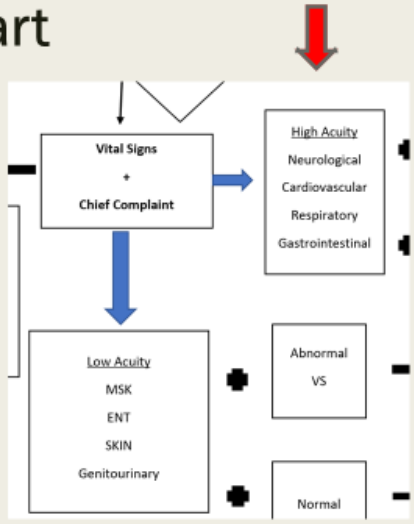
Step 2. Vital Room – patient is taken into the vital room. Vital sign will be completed and chief complaint is gathered.



FlowChart

Step 3. Determine if High or Low Acuity

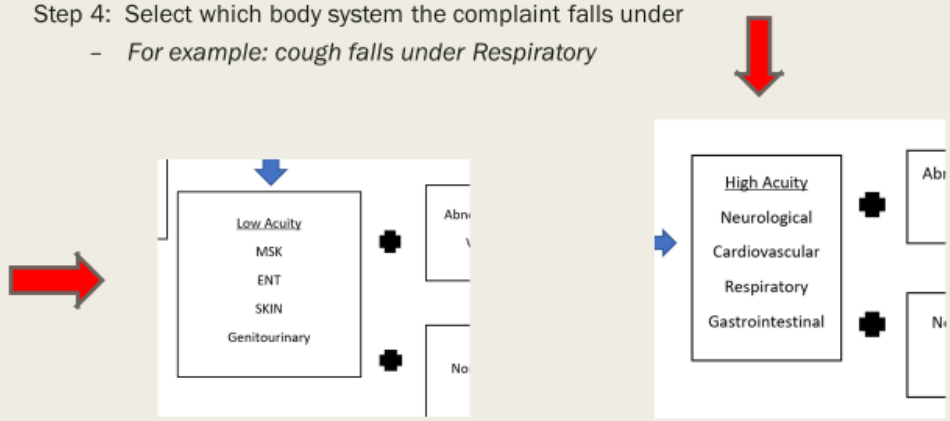
- High Acuity and Low Acuity boxes
  - Review the body systems
- Chief Complaint is sort by body systems



FlowChart

Step 4: Select which body system the complaint falls under

- *For example: cough falls under Respiratory*



FlowChart

Step 5: Complete the vital signs and determine if it is normal or abnormal.

For example:

- Normal: HR 105 R 20 BP 112/70 Temp 36.5 Pulse Ox 98%
- Abnormal: HR 112 R 24 BP 110/68 Temp 36.8 Pulse Ox 97%
- Normal: HR 90 R 18 BP 90/56 Temp 37.0 Pulse Ox 98%
- Abnormal: HR 76 R 18 BP 88/67 Temp 39.5 Pulse Ox 97%

ABNORMAL VITAL SIGNS

HR < 60 or > 100

RR < 12 or > 20

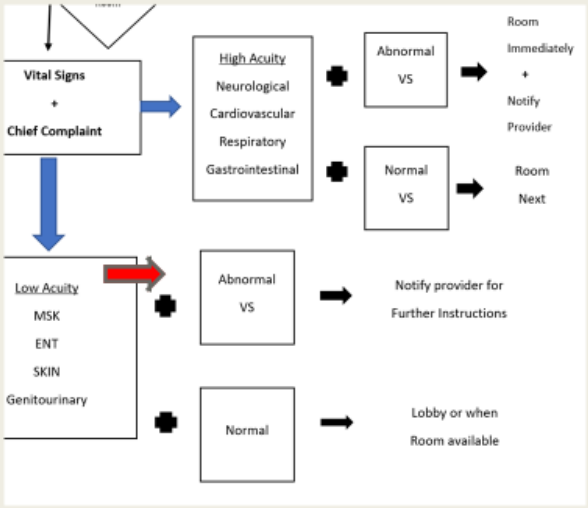
BP SBP < 90 or > 180

Sa O2 < 92%

Temp > 39.0

FlowChart

Step 6: Follow the arrows to determine the next intervention



When in Doubt....

- ASK THE TEAM LEADER
- ASK THE HEALTHCARE PROVIDER

- Remember – Our Goal is:
  - *Reduce door to provider time*
  - *Reduce patient adverse events*
  - *Increase patient safety*

References

- Google images
- Gilboy, N., Tanabe, P., Travers, D., & Rosenau, A. M. (2012). *Emergency Severity Index [ESI]: A triage tool for emergency department care* (4th ed.). Agency for Healthcare Research and Quality. Retrieved from www.ahrq.gov.
- Harding, K. E., Taylor, N. F., & Leggat, S. G. (2011). Do triage systems in healthcare improve patient flow? A systematic review of the literature. *Australian Health Review, 35*, 371-383.
- Robertson-Steel, L. (2006). Evolution of triage systems. *Emergency Medicine Journal, 23*(2). doi: 10.1136/emj.2005.030270

Appendix E

Pre and Post Exam

Instructions: Please read the questions carefully and select the best answer.

Item Number	Item
1	**A Triage Protocol (Select all that apply):** a) manages patient volume and prioritizes the order to which patients should be seen by the healthcare providers b) considers the patient's chief complaint and an initial vital sign evaluation to determine the triage level c) provides an algorithm to direct patient flow with consideration to patient safety in the department d) a, b, and c are correct answers **Answer: d**
2	**An 18-year-old male presents to the clinic for a second opinion as he was just seen by his primary care doctor yesterday for a complaint of right great toe pain. The Urgent Care is very busy with only one available exam room at this time. Vital signs are: HR 80, R 20, BP 110/78, Temp 36.8, Pulse Ox 99%. Which of the following action is the most appropriate for the healthcare staff to do?** a) Finish the vital sign and seat the patient in the lobby until an exam room is available b) Room the patient immediately c) Start setting up for a procedure d) Notify the healthcare provider immediately **Answer: a**
3	**A 56-year-old female with past medical history of hypertension and diabetes, presents with chest pain and dizziness that started approximately one hour ago while resting on the couch when the pain started. Patient appears to be anxious. Vital signs are: HR 122, R 24, BP 110/78, Temp 36.8, Pulse Ox 97%. Which of the following action is the most appropriate for the healthcare staff to take?** a) Send the patient out to the lobby since her vitals are within normal range b) Finish the set of vital signs and send patient back out to the lobby c) Room the patient immediately and notify the healthcare provider

	d) Recheck the set of vitals then decide what to do based on the algorithm **Answer: c**
4	**A healthcare professional currently performing a set of vital signs on a patient with complaints of epistaxis, understands that she has to immediately notified a healthcare provider when she saw the following vital sign reading:** a) HR 98, R 20, BP 122/70, Temp 36.2 Pulse Ox 99% RA b) HR 78, R 18, BP 112/68, Temp 36.8 Pulse Ox 97% RA c) HR 112, R 20, BP 182/70, Temp 36.5 Pulse Ox 98% RA d) HR 60, R 18, BP 130/70, Temp 37.2 Pulse Ox 99% RA **Answer: c**
5	**The Urgent Care was getting ready to close when 4 patients checked in 15 minutes prior to closing time. Which of these patients should the healthcare provider see first?** a) A 35-year-old who has a closed ankle fracture with VS: temp 37.0, HR 74, R 18, BP 110/74, 98% RA b) A 10-year-old who has sore throat with VS: temp 36.8, HR 78, R 18, BP 129/86, 98% RA c) A 68-year-old with chest pain with VS: temp 37.0, HR 117, R 24, BP 154/87, 98% RA **d)** A 43-year-old with left ear pain with VS: temp 37.2, HR 90, R 18, BP 132/84, 97% RA **Answer: c**
6	**After performing a set of vital signs on a patient with chief complaint of abdominal pain with only one exam room available and a set of vital signs: HR 135, Resp 24, BP 90/64, Temp 36.5, RA 93%. Use the TAP to demonstrate the most appropriate next step.** a) Send the patient back out to the waiting room b) Room the patient immediately and notify the provider c) Have the patient wait another 10 minutes and recheck his or her vitals d) Leave the patient in the vital sign room until the next exam room becomes available. **Answer: b**
7	**A 26-year-old female comes in with a complaint of an abscess to her left arm that she noticed this morning. The patient tells the healthcare staff her arm is hurting really bad and she has to be seen right away. It is a busy day in the Urgent Care Clinic.**

	Patient's vital signs are: HR 76 R 16 BP 117/60 Temp 36.2 Pulse Ox 99%. What is the most appropriate response to the patient? a) Room immediately b) Notify the Provider c) Have patient wait in the vital room for 10 min and recheck vitals d) Have patient wait in the lobby and room when next bed is available **Answer: d**
8	**A 70-year-old female walks into the clinic with a chief complaint of shortness of breath for the last 2 days. Her vital signs are: HR 142, R 24, BP 92/54, Temp 39.0, Pulse Ox 92%. What is the most appropriate action for the healthcare staff to take?** b) Have patient wait in the lobby and room when next bed is available c) Wait 10 minutes then recheck her vitals again d) Notify the healthcare provider for further instructions e) Immediately room the patient and notify the healthcare provider immediately **Answer: d**
9	**A medical assistant is irrigating a laceration to the left leg when the patient passes out. She lays him flat, yells for help, and quickly takes a set of vital signs. Which of the following vital signs indicate that a healthcare provider needs to be immediately notified?** a) HR 42, R 16, BP 102/70, Temp 36.0 Pulse Ox 97% RA b) HR 78, R 18, BP 112/68, Temp 36.8 Pulse Ox 97% RA c) HR 100, R 20, BP 132/64, Temp 36.5 Pulse Ox 98% RA d) HR 60, R 18, BP 130/70, Temp 37.2 Pulse Ox 99% RA **Answer: a**
10	**A 32-year-old male comes in with a chief complaint of abscess to right arm for 2 days. He has a history of IV drug use. His last injection was 2 days ago. The patient's vital signs are BP: 140/65, HR: 125, R: 18, Temp: 38.2, O2 Sat 98% on RA. Using the TAP, what is the next action for this patient?** a) Send the patient back out to the lobby b) Tell the patient to go to the emergency department c) Wait 10 minutes then recheck patient's vital signs

	d) Notify the healthcare provider for further instructions **Answer: a**
11	**Which of the following patient complaints will get the next bed?** a) 19-year-old female with right arm pain after a fall with VS: temp 37.2, HR 86, R 16, BP 112/68, RA 98% b) 22-year-old with abdominal pain and fevers with VS: temp 39.0, HR 106, R 20, BP 122/60, RA 98% c) 34-year-old with ear pain for 2 days with VS: temp 36.8, HR 90, R 20, BP 132/72, RA 97% d) 48-year-old with right foot pain for one week with VS: temp 36.5, HR 70, R 16, BP 116/52, RA 97% **Answer: b**
12	**Based on the TAP, the healthcare staff knew the patient with headache fit under the high acuity box because of which body system:** a) Gastrointestinal b) Cardiovascular c) Neurological d) Respiratory **Answer: c**
13	**After the patient has been registered, the healthcare staff understands that the next most important step is:** a) Walk the patient to the vital sign room and obtain a set of vitals and the chief complaint b) Have the patient wait in the lobby until the next room is available then take the set of vitals and obtain chief complaint c) Room the patient immediately d) Wait for the healthcare provider to be available before taking the patient to the vital room to obtain 4a set of vital and chief complaints **Answer: a**
14	**Following the TAP, after taking a set of vitals and obtaining the patient's chief complaint, what is the next appropriate step:** a) Send the patient back out to the lobby to wait for the next available room b) Room the patient immediately

	c) Notify the healthcare provider immediately d) Determine if the patient's chief complaint falls under Low Acuity or High Acuity and evaluate if the vital signs are within normal range. **Answer: d**
15	**After taking a set of vitals and obtaining the chief complaint, the healthcare staff sent the patient back out to the lobby to wait for the next available room because:** a) The patient has a low acuity and normal vital signs b) The patient has a low acuity and abnormal vital signs c) The patient has a high acuity and normal vital signs d) The patient has a high acuity and abnormal vital signs **Answer: a**

Appendix F

Expert Final Rating Table

Content Validity Index Table

Item	Expert 1	Expert 2	Expert 3	Mean
1	4	4	4	1.00
2	4	4	4	1.00
3	4	4	4	1.00
4	4	4	4	1.00
5	4	4	4	1.00
6	4	4	4	1.00
7	4	4	3	0.83
8	4	4	3	0.83
9	4	4	4	1.00
10	4	4	4	1.00
11	4	4	4	1.00
12	4	4	4	1.00
13	4	4	4	1.00
14	4	4	4	1.00
15	4	4	4	1.00
Total	1.0	1.0	.08	**0.97**

The procedure consists of having experts rate items on a four-point scale of relevance. Then, for each item, the item (CVI) (I-CVI) is computed as the number of experts giving a rating of 3 or 4, divided by the number of experts-the proportion in agreement about relevance.

The content validity index is calculated using the following formula:

CVR = [(E-(N/2)) / (N/2)] with E representing the number of judges who rated the item as **Moderately Relevant or Highly Relevant** and N being the total number of judges.

The mean total of all of the means was 0.97 using all three methods, indicating that all of the questions were **highly relevant.**

Appendix G

Chart Audit Tool

Patient initial: _____

Date of visit: _____

Time checked in: _____

Age: _____

Chief complaint: _____

Vital Signs: BP_____ HR _____ Respiration_____ Temp _____ RA _____

Circle one: Acuity Level - High Low

Time patient in the room: _____

Time seen by provider: _____

Interventions: _____

Outcome: (circle one)

Improve

Stable

Worsen

Disposition and time of disposition: (circle one and write down time of disposition)

Discharge _____

Transferred to higher level of care _____

Left Against Medical Advice _____

Provider Initial: _____

Appendix H

Table 1

Statistical Significance for Pre and Post Exam

Test Statistics[a]	
	Post-score - Pre-score
Z	-4.650[b]
Asymp. Sig. (2-tailed)	.000
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

Table 2

Overall Door to Provider Time Per Immediate Comparison for Current Year

		Year	Final_Average_Wait_Time_Per_Day
		Mean	Mean
Immediate_comparison	.	2017	60
	After	2018	26
	Before	2018	53

Appendix I

Table 3

Overall Door to Provider Time Per Year

Report				
Final_Average_Wait_Time_Per_Day				
Year	Immediate_comparison	Mean	N	Std. Deviation
2016	.	61.64	28	9.776
	Total	61.64	28	9.776
2017	.	59.29	28	7.096
	Total	59.29	28	7.096
2018	After	26.32	28	7.237
	Before	52.68	28	5.172
	Total	39.50	56	14.686
Total	.	60.46	56	8.547
	After	26.32	28	7.237
	Before	52.68	28	5.172
	Total	49.98	112	15.935

Table 4

Statistics for Door to Provider Time for High Acuity Per Year

Group Statistics					
	Year	N	Mean	Std. Deviation	Std. Error Mean
Final_Average_Wait_Time_	2017	28	46.14	3.679	.695
Per_Day	2018	56	30.70	10.799	1.443

Appendix J

Table 5

Statistical Significance for Door to Provider Time for High Acuity

		Levene's Test for Equality of Variances	
		F	Sig.
Final_Average_Wait_Time_Per_Day	Equal variances assumed	43.724	.000
	Equal variances not assumed		

t-test for Equality of Means						
					95% Confidence Interval of the Difference	
t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
7.340	82	.000	15.446	2.105	11.260	19.633
9.643	75.239	.000	15.446	1.602	12.256	18.637

Table 6

Door to Provider Time High Acuity Final Average Per Year

Final_Average_Wait_Time_Per_Day * Year				
Final_Average_Wait_Time_Per_Day				
Year	Mean	N	Std. Deviation	% of Total Sum
2016	44.36	28	7.130	29.2%
2017	46.14	28	3.679	30.4%
2018	30.70	56	10.799	40.4%
Total	37.97	112	11.281	100.0%

Appendix K

Table 7

Door to Provider Time High Acuity Final Average Per Immediate Comparison for Current Year

Final_Average_Wait_Time_Per_Day * Immediate_comparison				
Final_Average_Wait_Time_Per_Day for Year 2018				
Immediate_comparison	Mean	N	Std. Deviation	% of Total Sum
.	45.25	56	5.693	59.6%
After	21.57	28	4.255	14.2%
Before	39.82	28	6.837	26.2%
Total	37.97	112	11.281	100.0%

Appendix L

Table 8

Statistical Mean Data for Adverse Events Per Year

Descriptives					
	Year			Statistic	Std. Error
Final_Adverse_Event_Cases	2016	Mean		3.75	.708
		95% Confidence Interval for Mean	Lower Bound	2.19	
			Upper Bound	5.31	
		5% Trimmed Mean		3.61	
		Median		3.50	
		Variance		6.023	
		Std. Deviation		2.454	
		Minimum		1	
		Maximum		9	
		Range		8	
		Interquartile Range		3	
		Skewness		.922	.637
		Kurtosis		.393	1.232
	2017	Mean		3.33	.284
		95% Confidence Interval for Mean	Lower Bound	2.71	
			Upper Bound	3.96	
		5% Trimmed Mean		3.31	
		Median		3.00	
		Variance		.970	
		Std. Deviation		.985	
		Minimum		2	
		Maximum		5	
		Range		3	
		Interquartile Range		1	
		Skewness		.559	.637
		Kurtosis		-.309	1.232
	2018	Mean		2.08	.229
		95% Confidence Interval for Mean	Lower Bound	1.58	
			Upper Bound	2.59	
		5% Trimmed Mean		2.09	
		Median		2.00	

		Variance	.629	
		Std. Deviation	.793	
		Minimum	1	
		Maximum	3	
		Range	2	
		Interquartile Range	2	
		Skewness	-.161	.637
		Kurtosis	-1.261	1.232

Appendix M

Table 9

Statistical Data for Adverse Events Per Year

Group Statistics					
	Year	N	Mean	Std. Deviation	Std. Error Mean
Final_Adverse_Event_Cases	2017	12	3.33	.985	.284
	2018	12	2.08	.793	.229

Table 10

Statistical Data of Significance for Adverse Events Per Year

		Levene's Test for Equality of Variances	
		F	Sig.
Final_Adverse_Event_Cases	Equal variances assumed	.628	.437
	Equal variances not assumed		

t-test for Equality of Means						
					95% Confidence Interval of the Difference	
t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
3.425	22	.002	1.250	.365	.493	2.007
3.425	21.043	.003	1.250	.365	.491	2.009