Utilizing a Triage Protocol in Urgent Care Setting

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Abstract

Urgent care clinics provide more accessibility to immediate care compared to primary care offices, which has led to a greater number of patients visiting the urgent care causing congestion and overwhelmingly long wait times. The long patient wait times has caused delay in assessment of patients by the health care providers. This is measured by door-to-provider time. As a result, this delay causes complications, more patients leaving without been seen and even deaths. This quality improvement project aims at reducing the door-to-provider time through implementing a triage algorithm protocol. The implementation aimed at improving rooming of patients with high acuity based on protocol criteria, reducing door-to-provider time compared to the current practice as determined by chart audits, and improving staff prioritization knowledge and skills. This was demonstrated by use of evidence-based clinical research and theoretical foundation of the Donabedian model to design the protocol that fits the urgent care setting. The triage algorithm positively impacted the urgent care setting through reducing the door-to-provider time.

Utilizing a Triage Protocol in an Urgent Care Setting

In 2012, of the 50,808 patients seeking help from emergency rooms (ERs), 4,511 failed to receive attention (Shah, Punjani, Meghani, & Bhanji, 2014). Numerous patients without health insurance use ERs for nonemergent care, causing overcrowding. An overabundance of patients seeking care subsequently results in longer wait times, delays in care, and a reduced level of patient safety. Less than three percent of patients who seek help from ERs need urgent medical interventions (Erenler et al., 2016).

To streamline access to health care and decompress ERs, individuals should seek to receive their health care from appropriate levels of care providers. For instance, primary care physicians should be the source of nonemergent care, with urgent care obtained from either primary care or urgent care settings. However, limited office hours and appointment availability make primary care offices less accessible for situations in which patients need immediate treatment (Friesen, Patterson, & Munjal, 2015). In these cases, urgent care is a practical solution to address the needs of patients whose chief complaints are better served in a nonemergency setting (Genisca, Sampayo, Mackey, Johnson, & Crouse, 2018).

Although urgent care clinics provide more accessibility to immediate care than do primary care offices, there are barriers to delivering fast and efficient care. Many urgent care settings lack triage protocols, instead treating patients in order of arrival rather than in order of necessity; as a result, emergent patients may need to wait excessively long to receive care. In addition, urgent care providers do not always have the appropriate tools or systems for addressing patient acuity (Ingram & Powell, 2018). This first-come, first-served means of care is particularly concerning when an individual is suffering from an affliction that qualifies as an emergency in need of immediate attention, such as an asthma attack or abdominal or chest pains.

Although urgent care centers are not taking the place of ERs, practitioners can still examine and provide care for patients experiencing emergency symptoms. Urgent care health providers may also overlook patient acuity or the required effort to treat an individual upon arrival (Ingram & Powell, 2018). If a patient has a condition warranting immediate care yet does not receive treatment, the patient's condition can worsen and evolve into an adverse event. To improve door-to-provider time, prioritize patient acuity, and avoid the potential for an adverse event, urgent care providers should create a triage protocol to streamline the rooming process.

Introduction and Background

Many researchers have addressed the importance of the triage protocol in a health care setting to prioritize which patient to see first. The French word *trier*, origin of the word *triage*, appeared in the health care sorting process in 1792 from Baron Dominique Lean Larrey, a surgeon to Napoleon's Imperial Guard. From the French *service de santé* merged the triage concept and the organizational structure needed to handle the increasing number of warfare casualties (Robertson-Steel, 2006).

A triage protocol is an algorithm used by health care workers to determine which patient a provider should see and evaluate first based on the chief complaint, vital signs, and any other pertinent symptoms exhibited (Christ, Grossman, Winter, Bingisser, & Platz, 2010). With the use of the triage prioritization tool, patients who present with vital signs outside the normal range will receive quicker treatment than patients who present with critical symptoms but normal vital signs. Essential in health care systems, the triage prioritization tool enables the allocation of resources to the most critical cases for proper operations in the assessment and treatment area.

Layton, Tovar, Wiggins, Rayens, and Salt (2016) demonstrated that triaging facilitates the flow of patients, resulting in lower door-to-provider times for individuals with higher levels

of acuity. Hammad et al. (2017) argued that a triaging protocol is vital in health care centers. The protocol assists in identifying the level of care required, thus reducing wait time and lengthy patient hospital stays (Christ et al., 2010). The Center for Medicare and Medicaid Services (CMS; 2014) has tested triaging protocols, finding lower door-to-provider time in urgent care.

Problem Statement

The protocol currently used in urgent care to room patients is often that of first-come, first-served. Such a structure does not enable the use of prioritization based on patient acuity. Consequently, if a patient has an urgent complaint but arrived after another individual, the more acute patient will have to wait to receive care, leading to delays of care and adverse waiting room events that threaten patient safety. The best solution to prevent harmful events from occurring in the urgent care setting, reduce door-to-provider time, and improve health care outcomes is to implement a triage prioritization tool (Gilboy, Tanabe, Travers, & Rosenau, 2012).

Purpose Statement

The purpose of the proposed project is to implement an evidence-based triage tool in the urgent care setting. This tool will improve rooming of patients with high acuity based on protocol criteria, reduce door-to-provider time compared to the current practice as determined by chart audits, and improve staff prioritization knowledge and skills. Effective triage protocols are proven to reduce wait times and increase the quality of care (Reinhardt, 2017).

Project Question

Will a triage protocol improve door-to-provider time, increase the knowledge and skills of prioritization among support staff and providers, and reduce adverse events from occurring in the urgent care setting?

P: Increased wait times and adverse events occurring in the urgent care setting

I: Development and implementation of triage prioritizing tool or protocol

C: No triage strategy versus a triage prioritizing tool or protocol

O: Reduced door-to-provider time, improved staff knowledge about prioritization, and fewer adverse events occurring in the waiting room

T: Implemented over a 4- to 6-week period

Project Objectives

Following are objectives of the project within the timeframe of the Doctor of Nursing Practice (DNP) program:

1. Develop and implement an evidence-based, standardized triage protocol.
2. Educate all staff on the new protocol.
3. Implement the new protocol, and then evaluate the staff's knowledge and skills before and after protocol implementation using pre- and posttests.
4. Reduce door-to-provider time based on current practice as determined by chart audits.
5. Reduce adverse events resulting in transfers to a higher level of care

Search Terms

The literature search was a means to identify themes relevant to triage and triage protocols to assist with DNP project development. Databases searched included CINAHL, Jay Sexter, and PubMed using the search terms *triage*, *emergency department*, *patient prioritization*, and *triage in urgent care*. The term *triage* yielded 718 results, with *emergency department*, *patient prioritization*, and *triage in urgent care* returning 223 results. Abstract reviews helped in evaluating the articles for evidence hierarchy and relevance to the practice. After researching and analyzing the material carefully, the 27 most valid and relevant articles underwent careful review. All articles had publication dates in the last 5 years due to the dynamic nature of medical

research, particularly with respect to triage prioritization tool implementation. Across this literature, researchers addressed different aspects of the importance of triage in health care. Nine authors examined triage in the emergency department (ED), with another seven studying patient satisfaction. Five articles pertained to the effects of triage and six related to triage in urgent care. The topic of triage prioritization tool implementation in EDs merited consideration because the core aspects of implementation are the same, whether in the ED or in urgent care.

Other qualifying criteria were that researchers had to discuss the application of triage protocols to improve urgent care in the outpatient clinical setting. No articles by medical students or non-physician health care providers were eligible, because the two groups are not well experienced in the interpretation of research findings. In addition, although they served as a means to evaluate articles for relevance, abstracts alone were insufficient for review as they could not provide a full text for analysis. Finally, only full-text, English-language articles underwent review.

Review of Literature

Over the past 10 years, triage has become a standard protocol in the outpatient setting. Triage is a means to prioritize patient treatment by importance, reducing wait times for surgical procedures or specialty provider visits, and subsequently enhancing the quality of care. Developed to fit the needs of a particular venue, triage protocols vary across health care settings. Conducting the literature review assisted in identifying several themes associated with establishing triage protocols, including the following: recognizing the importance of triage; reducing door-to-provider times; minimizing rates of left without being seen (LWBS); lowering the risk for hospital admissions; improving patient throughout; and eliminating perceived

barriers to implementation, such as lack of staff, poor communication, low level of education and skills, and adverse or near-adverse events.

Importance of Triage

Triage involves prioritizing patients' treatment based on the severity of their conditions when there are insufficient resources to see all patients immediately (Becker et al., 2015). Many health care settings have implemented triage protocols to respond to quality improvement needs (McEvoy, Wiles, Berhardsson, & Grimmer, 2017). Among others, some of the factors limiting urgent care settings from adopting patient prioritization and evaluation protocols are lack of guidelines and protocols, poor communication among staff, lack of experience by providers, and staff shortages (Gardner, Friedman, Carlson, Bradham, & Barrett, 2018; Lowth, 2015; Memmel & Spalsbury, 2017). However, triage protocols are critical, demanding that providers prioritize patients based on presentations, chief complaints, and vital signs (Lowth, 2015; Reinhardt, 2017). Facilities without triage protocols use a means of first-come, first-serve treatment, a method that is less effective and leads to adverse health effects and high door-to-provider times (Laliberté, Feldman, Williams-Jones, & Hunt, 2018).

Reducing Door-to-Provider Time

The triage protocol has contributed to improvements in door-to-provider times and reduced patient wait time (Harding, Taylor, & Leggat, 2011). In applying the Manchester triage protocol, Storm-Versloot, Vermeulen, van Lammeren, Luitse, and Goslings (2014) found waiting time better distributed across urgency levels. McEvoy et al. (2017) reported that when a spinal clinic used a detailed triage protocol, patient wait times to see orthopedic surgeons and neurosurgeons decreased. Riska, Akin, Williams, Rouse, and Murnane (2017) utilized a retrospective chart review method with the same triage approach. Using skilled and experienced

staff to conduct triage on patients with benign paroxysmal positional vertigo, Riska et al. arrived at results similar to those of McEvoy et al., finding reduced patient wait times to see the neurologist.

Valsangkar, Eppstein, Lawson, and Taylor (2017) studied an on an outpatient surgery center that applied an ideal lean mapping triage protocol to prioritize the needs of patients based on surgery acuity, also finding lower patient wait times to have surgery. Valsangkar et al. (2017) repeated the study three times for 8 months over 3 successive years, each time with the same results; hence, the study had the highest rating in reliability and validity.

Harding et al. (2011) used a protocolatic review approach to conduct a triage protocol, a process that entailed combining treatment approaches with the triage protocol to speed the completion of simple interventions and improve patient flow of less-emergent patients in the ED. The researchers found better patient flow with the protocol, with more than 20% of patients discharged in triage without delay after completion of interventions; in addition, there was a 3-hour reduction in wait times to see a health care provider.

Risk for Hospital Admissions

Use of triage nurses to request investigations such as X-rays and blood tests leads to early diagnosis and reduced risk of hospitalization (Jarvis, 2016). Proper assessment, communication, clinical, and risk management skills are necessary for first-rate triage (Lowth, 2015). Patients with vital signs outside of the normal range have higher chances of hospitalization and death (Hart, Woodruff, & Joy, 2016; Mehmood et al., 2015; Nguyen et al., 2017). Triage protocols can help in prioritizing patients, thus preventing such adverse outcomes. Mehmood et al. (2015) found higher admission rates for patients with abnormal vital signs not diagnosed early. Research has shown that triage in outpatient clinic settings, especially in the ED, result in reduced rates of

hospital admission through prioritizing patient's chief complaints, acuity levels, vital signs, and stability (Gardner et al., 2018; Hammad et al., 2017; McEvoy et al., 2017; Reinhardt, 2017; Riska et al., 2017; Slusar, Couban, & Shivakumar, 2017; Tucker, Clark, & Abraham, 2013).

Patient Throughput

Throughput refers to the sum of services offered by health care institutions per unit of time. Delay of patient throughput may stem from several factors, such as workflow inefficiencies, poor communication, and delay in the completion of orders (Gardner et al., 2018; Valsangkar et al., 2017). Inefficient patient throughput leads to overcrowding in urgent care environment s (Zhu, Heng, & Teow, 2012). Introducing a triage protocol in the urgent care setting allows providers to see as many patients as possible, something beneficial for both patients and facilities (Gardner et al., 2018).

Barriers to Implementation

Understanding barriers to change management can enable any organization to create successful strategies for identifying and implementing change. Change is an essential aspect of all organizations and targets, shifting from one state to another for the good of the organization (Checkland, Harrison, & Marshall, 2007). Barriers identified in the literature included staffing and communication, and levels of education and training.

Staffing and communication. Lack of staff and poor communication are two factors that hinder change implementation (Grossman & Valiga, 2009; Lowth, 2015). On many occasions, triage becomes ineffective because of insufficient human resources to fill needed positions and complete tasks necessary for the system to work effectively (Harding et al., 2011). According to Reinhardt (2017), triage to provider time correlates with the number of nurses available during the shift, the time of day, and the number of patients waiting. Effective communication

contributes to teamwork, thus improving health care outcomes in an urgent care setting (Curtis, 2014).

Levels of education and training. Staff education levels and skills acquired through training contribute greatly to the effectiveness of triage protocols in health care facilities. Staff training is one of the most critical aspects of the implementation of triage protocols. Ebrahimi et al. (2016) investigated the vital role of triage nurses in the ED and how well they balanced the newer responsibilities that accompanied their role. Using a modified Delphi study, the authors found that triage nurses needed substantial development to be effective. Comprehensive educational programs and advanced research are essential to supporting triage nurses as they implement diagnostic and therapeutic techniques. Even though there are various tentative standards and protocols for triage procedures that nurses could employ to improve ED patient flow, these protocols are suggestive and do not establish a definite role for the triage nurse (Ebrahimi et al., 2016). The nurses need to understand these protocols completely to implement them effectively. Reinhardt (2017) found that knowledge and experience levels differ based on triage experiences. Some employees are unaware of policies, protocols, procedures, patient assessment, what is normal or abnormal, and other vital aspects of a triage protocol (Lowth, 2015). Therefore, evaluating the level of staff education and providing training for those not highly competent is needed before implementing change (Grossman & Valiga, 2009).

Sayah, Rogers, Devarajan, Kingsley-Rocker, and Lobon (2014) analyzed the impact of a process improvement project at the Cambridge Hospital ED in Massachusetts by refocusing the patient experience from arrival to departure. Before the interventions, the Cambridge Hospital ED experienced similar disparities to other EDs, including long wait times, inefficient protocols, and poor patient experiences. Sayah et al. (2014) collected data using Meditech and EPIC

electronic medical record technology, measuring length-of-stay data using timestamps and assessing patient satisfaction through surveys. Flags alongside patient names indicated LWBS patients. Sayah et al. saw improvements in all categories following the application of relevant interventions and achievement of all improvement goals. The three main components behind the ED's success were gaining directorial support, aligning a leadership team, and including stakeholders. The improvement study was an example of implementing triage protocols and identifying key aspects of focus when doing so.

Increase in Rates of Left Without Being Seen

According to Chan, Killeen, Kelly, and Guss (2005), wait times in the ED and rates of LWBS were indicators of overcrowding in urgent care and ED settings. A triage protocol is one solution for reducing the rate of LWBS. Hayden, Burlingame, Thompson, and Sabol (2014) found that, with inefficient front-end operations, EDs worldwide are experiencing increased wait times and higher rates of LWBS patients, resulting in reductions in patient satisfaction. Hayden et al. (2014) suggested placing a family nurse practitioner in triage to assess and monitor patients' conditions could help mitigate the problems. Jesionowski, Riordan, and Quatrara (2019) conducted a research study in an attempt to reduce LWBS and length of stay at rural academic medical centers and specialty hospitals. The researchers implemented a rapid medical intervention with and without a nurse in triage, with results indicating that medical interventions without a nurse in triage corresponded with high rates of LWBS.

Adverse Events and Near-Adverse Events

Adverse and near-adverse events in the urgent care setting can result in patient dissatisfaction and financial loss for health care facilities (Kizer & Stegun, 2007). When Reinhardt (2017) assessed a busy ED, he found that adverse events were associated with long

wait times, leading to a delay in care. Clinical settings, therefore, must adopt a triage protocol to avoid adverse or near-adverse events. Establishing a triage protocol to help in prioritizing the acuity of patients is essential in lowering patient adverse events (Gardner et al., 2018).

Current Evidence Regarding the Problem

Use of a triage algorithm has shown to be an effective way of reducing door-to-provider times and improving patient flow (Gardner et al., 2018; Hammad et al., 2017; McEvoy et al., 2017; Reinhardt, 2017; Riska et al., 2017; Slusar et al., 2017; Tucker et al., 2013). As new diseases and afflictions continue to emerge, patient volumes increase in urgent care settings (Leventhal, Hill, Nowak, & Bonhoeffer, 2015), indicating a need to prioritize patients to prevent adverse outcomes (Owen et al., 2017). Although triage protocols have been in use for years, scholars continue to research for quality improvement. Many hospital settings use this type of protocol; however, the practice is still new for most outpatient settings. Therefore, research is essential to ensure the creation of a triage protocol that fits well in the outpatient setting (Gardner et al., 2018; Valsangkar et al., 2017).

Review of Study Methods

The literature review comprised randomized controlled trials, integrative reviews, mixed methods, comparative studies, interventional trial-reviewed research studies, and retrospective cohort studies. An evaluation of methodologies in the literature produced a list of rising themes pertinent to the DNP project. Methodology is relevant to both the researchers' objectives as well as the proposed project, as past scholars discussed the importance of triage protocols in health care, finding improvements such as decreased door-to-provider time, reduced overcrowding, and prevention of unnecessary hospitalization. Particular methodologies were more effective for some studies, showing precise approaches used by the authors in answering the research

questions. Researchers chose specific study methods to identify that already known about the topic and the amount of research the subject has received, much of which will easily transfer to the practice site for the DNP project.

Significance to the Profession

Clinically trained nursing professionals who assess patients to evaluate their symptoms run triage protocols in health care. The nursing professionals discuss the chief complaint with the patient and decide whether or not the patient is in danger and merits placement on a priority list. The primary goals of the triage protocol are to care for all patients and streamline care delivery so that patients are admitted and discharged appropriately and promptly. Efficient triage protocols improve patient-to-provider time, enhance patient flow and offer another opinion for the outpatient clinical settings where high numbers of patients and patient acuity need consideration to ensure that the patients receive high-quality care (Gardner et al., 2018; Harding, Taylor, & Leggat, 2011). The project is highly significant to the nursing profession because nurses have a chance to contribute to improvement in health care and increase the quality of care. However, for the protocol to be successful, there is a need to evaluate the barriers to triage implementation and find a solution for execution.

Conceptual Framework

The Donabedian model will guide the DNP project. The model offers a framework used in assessing health services and quality of care. According to the Donabedian model, information concerning health care quality comes from three categories: structure, process, and outcomes (see Appendix A). The structure illustrates the situation in which health care delivery takes place, as well as the hospital premises, employees, equipment, and financing. The process demonstrates relationships between providers and patients during health care delivery (Voyce, Gouveia,

Medinas, Santos, & Ferreira, 2015). The Donabedian conceptual model is a means to develop a practical framework for policy agenda and research to improve and measure the quality of care (Liu, Singer, Sun, & Camargo, 2011).

Historical Development of the Framework

Avedis Donabedian was a physician and the founder of the study of quality in health care and medical outcomes research. Donabedian received the degree of BA in 1940 and MD in 1944. Avedis developed the Donabedian model in 1966 when working as a doctor at the University of Michigan. While working for the school of public health, the researcher realized there was no scale to gauge the quality of health care and sought to fill that need (Moore, Lavoie, Bourgeois, & Lapointe, 2015). Donabedian described three components of the model in a 1966 article entitled "Evaluating the Quality of Medical Care," as a foreword to the scrutiny of methods utilized in health care services studies. Dr. Donabedian identified three categories useful to assess quality of care: structure, process, and outcome. In 1980, Donabedian published *The Definition of Quality and Approaches to Its Assessment, Volume. 1: Explorations in Quality Assessment and Monitoring,* offering a deeper explanation of the structure-process-outcome model. In the book, Donabedian further defined and clarified the categories of structure, process, and outcome to differentiate health care quality as good, fair, or poor. Moreover, Donabedian (2005) stated, "To determine health care quality, there should be a relationship between the three categories, and the connection is a chance rather than a certainty" (p. 706). In developing the model, the physician provided a means to assess health care quality and offer improvements in the clinical process, thus achieving the main goal in health care of improving patient outcomes.

The relevance of the Donabedian model to the nursing profession is significant. At the primary level, application of the framework is by modifying processes and structures in health

care to improve quality in different units (Unruh & Wan, 2004). Various scholars have used the Donabedian model to measure the quality of services health care professionals offer. Kobayashi, Takemura, and Kanda (2011) applied Donabedian's structure-process-outcome approach to assess patients' perception of nursing services quality. For purposes of the study, Kobayashi et al. (2011) defined structure as the provider's qualifications, administrative system, and setting; in turn, process was the components of care, including the relationship between the providers and patients with the outcome being patient satisfaction. Kobayashi et al. (2011) found the model helped in determining patients' experiences with nursing services with low satisfaction, signaling the need to improve facilities' structure and processes. The researchers concluded the model was useful for enhancing the quality of nursing practice and patient outcomes.

Kunkel, Rosenqvist, and Westerling (2007) analyzed the usefulness of the Donabedian framework in describing quality systems. For purposes of the study, structural characteristics were providers with quality improvement competence and available time. The structure was related to the process, with support from colleagues in the form of quality improvement approval or active participation. In addition, the structure was related to outcome characteristics, such as periodic evaluation of the goals for the quality system and documentation of staff feedback. Kunkel et al. (2017) findings showed the applicability of Donabedian's model in evaluating, describing, and comparing health care quality systems. The framework could also help in applying evidence-based and orderly systems for working with quality improvements in hospital departments.

In delivering quality care, nurses play an essential role in all three categories of the Donabedian model. According to Rupp (2018), the most crucial element of the model is care, a quality possessed by almost every nurse. Professional nursing practice involves expert skills

developed through years of education and experiences; therefore, the nursing profession meets the three categories of the model (American Hospital Association, 2018). Based on prior research findings, the Donabedian model will be both applicable and useful in this DNP quality improvement project.

Applicability of the Conceptual Framework to Current Practice

The changing nature of modern health organizations comes with the pressure to enhance health care quality, reduce costs, as well as meet strict directions for care and demanding assessment of health care professionals' performance. Although many health institutions have long acknowledged the need to look past financial statements when measuring performance, most struggle with what strategies to use in evaluating the quality of services (Hudson, Weston, & Farmer, 2017). Many health care organizations have adopted quality concepts, one of which is the Donabedian model. In health care settings, quality improvement demonstrates excellent results to increase incentives for CMS reimbursement (Evensen et al. 2018). According to the Donabedian model, an organization is a structure with the process involved in producing the outcomes. For the model to work effectively, organizations must have strong leadership, communication, and organization (Dimick, 2010).

The Agency for Healthcare Research and Quality (AHRQ) is a federal agency currently using the Donabedian model to implement quality improvement measures by assessing and comparing the quality of care provided by health care organizations (n.d). To ensure quality of care, AHRQ requires all health care organizations to implement appropriate structures and processes to achieve quality outcomes. AHRQ defines structure as the capacity of health care providers to offer high-quality care (AHRQ, n.d.). To facilitate the proper delivery of care, the agency requires health facilities to have competent providers and systems, such as electronic

medical records and a proper ratio of patients to providers. AHRQ measures the process by assessing health professionals' means to maintain or improve the health of both healthy people and individuals identified as having a specific illness. Measuring outcomes entails assessing the impact of health care interventions or services on patients' health status. Types of outcomes include deaths, surgical complications, and discharged patients, among others (AHRQ, n.d.).

The World Health Organization (WHO; 2014) also found the Donabedian model a useful tool in health care. In 2013, the WHO and Partnership for Maternal Newborn and Child Health utilized the model to develop key indicators of quality in maternal, newborn, and child care. The structure included physical facilities, material resources, and humans in primary and secondary health care facilities for maternal and child care services. Processes included all actions and care provided by the professionals, including respectful maternal care, with outcomes measured by mothers' satisfaction.

The South African Ministry of Health used the Donabedian model to assess the integrated chronic disease management (ICDM) model (Ameh, Gómez-Olivé, Kahn, Tollman, & Klipstein-Grobusch, 2017). Equipment, professionalism, and confidence represented structure, process, and outcome, respectively. Results showed that the link between structure, process, and outcome represented quality systems in the ICDM model. Findings indicated that Donabedian's theoretical framework was a valid means to provide evidence of quality systems in the ICDM model (Ameh et al., 2017).

Moore et al. (2015) applied the Donabedian model to assess the performance of an integrated trauma system and evaluate the relationship between quality domains. The researchers measured structural performance by importing onsite accreditation visit reports into an assessment grid. Measuring the composite process entailed calculating the average potions of

conformity of 15 quality indicators from expert opinion and literature review. Moore et al. measured outcome performance using risk-adjusted mortality rate, readmission, length of hospital stay, and complications. The researchers found significant correlations between quality domains observed in the study and showed that structure-process-outcome model was valid for evaluating trauma care. Trauma centers that have an effective structure perform well, thus producing favorable patient outcomes.

Gardner, Gardner, and O'Connell (2014) utilized the Donabedian model to evaluate the quality and safety of nurse practitioners' services. The results showed detailed and adequate preparation of structure and process was vital for the successful implementation of service innovation. The Donabedian model was effective in examining the quality and safety of service innovation. Worth (2017) also used the Donabedian model to assess the relationship between triage structure and processes in the ED that enhanced the accuracy of triage decisions. Organizational policy on triage education represented the structure, and the policies guided the process. Processes involved triage education and monitoring of quality, with the outcomes indicating a positive relationship between EDs with policies (structure) for triage (education process). As indicated by the aforementioned studies, the Donabedian model is effective in determining the quality of health care services. Additionally, the model is flexible and applicable in different hospital units.

Major Tenets of the Donabedian Model

According to Bemker and Schreiner (2016), the Donabedian framework centers on the relationship between patients and providers. The model incorporates the care setting or organizational structure, as well as the processes that support quality care delivery. The major tenets of the Donabedian conceptual framework are structure, process, and outcome.

Structure. This tenet comprises all the aspects that impact the circumstances in which health care delivery takes place, such as the equipment, premises, methods of payment, and staff training. The structural factors affect how the professionals and customers in a health care system behave (Liu et al., 2011). The structure is simple to measure and observe and may be the upstream cause of the challenges spotted in the process. Every unit in health care should have a comprehensive and well-designed structure that supports all processes taking place in the organization.

Process. Process refers to all the actions carried out in health care, including preventive care, diagnosis and treatment of diseases, and offering patients education about a disease, among others. Processes can undergo further grouping as practical processes, implying the manner of health care delivery or interpersonal processes, both of which cover the means of offering health care. Information regarding the process may come from health records, discussions with practitioners and patients, and observations of health care visits (Liu et al., 2011). Proper coordination among the providers ensures a smooth process.

Outcome. Outcomes are the impacts of medical care on patients as well as the changes in behavior, health status, or awareness, including health-associated quality of life and patient satisfaction. The outcomes are the necessary indicators of quality, as enhancing patients' status of health is the principal health care goal; however, accurately measuring the outcomes is challenging (Liu et al., 2011). Streamlining the flow of patients in urgent care may lead to fewer hospital admissions and reduced door-to-provider time.

Application of the Conceptual Framework to DNP Project

The flexibility of the Donabedian model makes for easy application to the DNP project. The model is well suited for assessing and modifying structures and processes in an urgent care

setting. The structure, processes, and outcomes will be based on the health care setting, which is urgent care.

Structure

The structure in the DNP project includes the physical space where the triage process will occur, the participants, and the tools used for implementation. All the essential elements needed to conduct the triage process will be available in advance. The facility and environment comprise one of the themes within the focus of the structure.

According to Bagherian, Sabzevari, Mirzaei, and Ravari (2017), technology shapes the efficacy of the health care system. Tools such as electronic health records help in streamlining activities by improving processes such as communication. Effective communication among providers will ensure a flow of patients, thus preventing overcrowding in the ED (Bagherian et al., 2017). Overall, a physical location, staff, participants, equipment, and technology will comprise the structure in the project.

Process

During the triage protocol implementation, activities will include developing a triage algorithm protocol (TAP), training the staff about triage, conducting triage, and choosing the patients who will see the physician first. The providers will need time, quality education, and valuable resources such as technology for the success of the process. In this category, providers will measure and record patients' temperature, pulse, respiratory rate, and blood pressure. Also noted will be patients' current complaints, past health problems, medications, and allergies.

Outcome

Statistical tests will be the means to measure outcomes based on the consultation of a statistician. Expected outcomes include reducing door-to-provider and wait times for patients

with high-acuity complaints and abnormal vital signs to prevent adverse or near-adverse events. Positive outcomes will be as follows:

1. Implement triage algorithm protocol in urgent care.
2. Educate the staff about the triage algorithm protocol. Ensure that all staff members score at least 95% on post-intervention case scenarios.
3. Reduce door-to-provider wait time by 45%.
4. Reduce patients' adverse events by 50%.

Project Design

The DNP project will entail the implementation of an evidence-based TAP in an urgent care setting to decrease door-to-provider wait times and enhance patient prioritization and evaluation depending on the acuity of their condition. Efficient and accurate triaging has proven to reduce wait times and optimize health care quality (Hammad et al., 2017; Reinhardt, 2017). This DNP quality improvement project will improve urgent care timeframes through the use of a TAP to reduce door-to-provider time for patients experiencing conditions considered to be higher acuity, such as shortness of breath and severe bleeding, among others. This DNP project will have a quality improvement approach. Quality improvement refers to the continuous and systematic actions that lead to measurable improvement in health care services of targeted groups (U.S. Department of Health and Human Services, 2011). An effective triage system improves patient flow and ensures that the most urgent patients receive timely services to prevent adverse or near-adverse events (Yang, Lam, Low, & Ong, 2016). The primary objective of this study is to devise ways to improve the flow of patients in urgent care settings and reduce the number of individuals transferred to higher levels of care.

Implementation steps will include developing a protocol, educating staff, assessing staff knowledge of the proposed triage algorithm through pre- and post-training, and incorporating chart audits to monitor compliance with the triage protocol. The dependent variable is the new protocol; the independent variables are the providers' knowledge and skills before and after education and compliance with utilization of the new protocol. Data analysis will entail the comparison of responses to pre- and post-assessment questions. Auditing of patient charts will determine provider compliance. The Statistical Package for Social Science (SPSS) version 26 will enable data analysis, with appropriate statistical testing per the recommendations of a statistician. Some of the project objectives are to reduce door-to-provider time based on current practice as determined by chart audits and to reduce adverse events resulting in transfers to a higher level of care. The project design will ensure the achievement of these objectives through implementation of a triage protocol that will prioritize high-acuity patients to see a provider in less time, thus reducing adverse or near-adverse events.

Population of Interest

The population of interest consists of medical assistants and licensed health care providers. All the health care workers who have completed orientation and have direct patient contact meet the criteria to participate, whereas the staff members who do not provide direct patient care, such as accountants and clerks, do not. There are five advanced practice nurses, two physician assistants, eight physicians, one licensed vocational nurse, and seven medical assistants employed in the urgent care clinic. Professional length of tenure ranges from new graduates who have no experience to seasoned providers with more than 15 years of experience.

Setting

The setting is a community urgent care clinic serving the Los Angeles County population. With an estimated population of 10.2 million, Los Angeles is one of the most populated cities in California and is known for its ethnic diversity (Population of Los Angeles, 2019). The urgent care clinic has four exam rooms and one procedure room, which serves 40 to 115 patients per day with one health care provider on duty. The patients range in age from birth to 90 years. Patients enter urgent care with low-acuity complaints such as allergies, colds, and coughs to high-acuity conditions such as shortness of breath, syncope, chest pain, and abdominal pain. The project site administrator has given permission for implementation of the project (see Appendix B).

Stakeholders

The owner of the urgent care clinic and health care staff who have met the inclusion criteria will be both participants and stakeholders. An initial participant meeting will take place on the first day of the first week of implementation to discuss the aim of the project and establish a relationship with the participants. Creating a strong rapport and open communication with the stakeholders is essential for successful project implementation (Butchibabu, Sparano-Huiban, Sonenberg, & Shah, 2016; Hall & Roussel, 2017).

Recruitment Methods

The project is a system-wide practice change supported by administration; therefore, participation for the medical assistants and providers will be compulsory. However, the employment contract does not necessitate anyone to participate in the project and failure to attend the training will not call for a disciplinary action. There is no compensation or incentives offered for participating. After the training, any staff members who fail to meet education

expectations will need to complete remediation. The project lead will review charts of patients seen in the urgent care four weeks prior to implementation of the new protocol and during the 4 weeks of implementation. Excluded from this review will be charts of patients below 18 years of age and those who had seen a provider in the urgent care longer than the 4 weeks before implementation and had received care after implementation, or who had left against medical advice during the implementation phase.

Tools/Instrumentation

Researchers develop instruments and tools to aid in data collection and analysis (Tidwell & Anaya, 2017). The evidence-based instruments and tools used in the project are a triage algorithm tool, an educational presentation, a pre- and posttest of the triage protocol, and a chart audit tool. The instruments will contribute toward the development and implementation of evidence-based standardized triage protocol, educate all staff on the new protocol, and evaluate staff knowledge before and after implementation using a pre- and posttest. Other objectives achieved will be reducing door-to-provider time and lessening the chance of adverse events that lead to transfer to a higher level of care.

Triage Protocol Tool

The AHRQ developed the triage protocol tool (TPT) using the Emergency Severity Index (ESI) to categorize ED patients according to acuity and resource needs. The TPT is a flowchart that provides a process for providers to follow to identify patients with high acuity (see Appendix C). The TPT incorporates a list of conditions considered low- and high-acuity chief complaints based on the systems of the body. According to Gilboy, Tanabe, Travers, and Rosenau (2012), the parameters of abnormal vital signs are based on the ESI. The TPT comprises an uncomplicated flowchart that all participants can implement without any

difficulties, directing patients to the correct area expeditiously based on the signs and symptoms with which they present.

Educational Presentation

The health care professionals can take part in an informative course regarding the use of TPT. A 30-minute PowerPoint presentation will be part of the mandatory meeting held 30 minutes before the clinic opens (see Appendix D). A question-and-answer session will allow participants to obtain any additional information needed. The group will discuss example scenarios following the presentation. Developed from scratch, the tools include information regarding the proposed procedures to identify the patients with abnormal vital signs. Information in the education tool is evidence-based, and thus reliable and valid (Yu et al., 2019).

Pre- and Posttest

Pre- and posttests are a means to evaluate learners' strengths, weaknesses, and knowledge (Schumm, 2017). Dr. Yang developed the pre- and post-assessment (see Appendix E) administered to participants and granted permission for the use of the tests (see Appendix F). Dr. Yang also conducted a content validity index to determine that the content was valid and reliable (see Appendix G). A content validity index helps in developing high-quality assessment tools, which can effectively accomplish the measurement role if considered valid and reliable (Polit, Beck, & Owen, 2007).

The pre- and posttests include the same set of 15 multiple choice questions, with participants needing a score of 90% or greater to pass. All participants' answers will remain confidential, with numbers instead of names used to identify participants. A data codebook will also contain only numbers in further efforts to maintain confidentiality. The test questions will be a means to evaluate and analyze staff members' ability to apply the concepts they have learned.

To maximize learning and knowledge retention, the staff may review the rationale and answer for each question as well as the responses they provided. Staff members who do not achieve a passing score must repeat the training until they do so.

Chart Audit Tool

The chart audit tool contains patient initials, the date of encounter, arrival time, age, the chief complaint, and vital signs. The provider will also record whether the acuity level is high or low, as well as arrival time and time seen by the provider. The provider will record the plan of action, the outcomes and recommendations, and time of discharge. The information in the audit tool will help assess whether the providers comply with the triage protocol (see Appendix H). Generally, the audit tool will help to determine whether the triage protocol was effective in reducing door-to-provider time for patients with higher-acuity complaints and abnormal vital signs. This would mean reducing the occurrence of adverse events and potentially lessening the number of transfers to higher levels of care, such as an ED.

Data Collection Procedures

The pre- and posttest of the staff will undergo manual grading with the results subsequently entered into SPSS to produce outcome measures. The pre-test administration will be just before the training, with the posttest given a day after the training. The participants will complete the posttest together despite having gone through the training in two groups. Analysis of the results will establish the efficacy of the training and education provided. As mentioned earlier, because participant identification will be confidential, the project lead will ensure that the tests have numeric codes before presentation to the participants. The lead will input the numeric codes into Excel spreadsheets and subsequently into SPSS. The project lead will randomly generate numbers using Excel's random number generator function. Only the project lead will

know which staff member coordinates with which number, with this information stored on an encrypted, password-protected secure laptop.

Data assessment will occur at the beginning of Week 1 through the end of Week 4 using the urgent care metrics for the door-to-provider timeframe for every patient registered in the clinic. At the end of Week 4 will be data collection, organization, compilation, creation, and finalization. The final report will show whether there has been a reduction in the general door-to-provider time. Data collected from the charts will include check-in time and door-to-provider time. The check-in time is the point at which a patient approaches the clerk for registration, whereas the door-to-provider time is the period between check-in and seeing the provider. The registration person will be recording the time for patient registration and the provider will be recording the actual provider time; if that time is less post-education compared to pre-education, it will be apparent that outcomes have improved.

Chart Audits

Retrospective chart auditing will take place 4 weeks before implementation and again during the four weeks of implementation for comparison. The use of a tool for chart audits will allow for data extraction to obtain the information necessary for the review. Charts will help in evaluating the reduction in adverse events. Data storage will be in a secured folder on a password-protected laptop to maintain confidentiality. Only the project lead will be able to access the laptop until the project implementation is complete.

Project Timeline

The quality improvement project is a means to implement a triage protocol in urgent care to reduce door-to-provider time. This project began in July 2019 with the creation of the project foundation. The project foundation consists of identifying a project topic to improve the quality

of care delivery, identifying the purpose and project question, performing a literature review, and discussing the theoretical framework for the project. In November 2019, a project design reformulation included identifying the population of interest, setting, stakeholders, and recruitment methodology, with the tools for project implementation also created and approved. Approval for project implementation will occur by the end of February 2020. Table 1 presents the implementation timeline, with project implementation scheduled for March 2020 after receiving approval from the project team and all stakeholders.

Table 1

Implementation Timeline

Week/date	Activity
Week 1 (3/9/2020–3/15/2020)	• Send emails providing the dates and times for the educational session. • Chart audit to collect information preimplementation data. • Reposition clinic set up for preparation of TPT. • Administer pre-test to participants. • Conduct two education sessions. • Administer posttest. • Collect test data. • Begin implementation.
Week 2 (3/16/2020–3/22/2020)	• Monitor implementation and provide support. • Re-educate any employees who did not pass the posttest. • Retest employees who failed the initial test, if a 100% pass rate • Collect data.
Week 3 (3/23/2020–3/29/2020)	• Assemble and store pre- and posttest results. • Input the results into SPSS version 26 to produce the final report. • Continue to monitor protocol implementation; provide support.
Week 4 (3/30/2020–4/5/2020)	• Monitor protocol implementation. • Provide staff support. • Collect data.
Week 5 (4/6/2020–4/12/2020)	• Analyze all collected data and report. • Evaluate project results. • Arrange to disseminate. • Arrange meeting with stakeholders. • Prepare to disseminate the project to instructors. • Create presentation.

Ethics and Human Subjects' Protection

The project will incorporate quality improvement and the assurance of protecting all participants from harm. The project lead will follow all ethical standards to protect the rights and dignity of the participants. The project lead will submit an Institutional Review Board (IRB) determination form in accordance with Touro University Nevada policy, although by falling under the category of a quality improvement project, this project should be exempt from IRB

review. The project lead will adhere to ethical practices to ensure beneficence, anatomy, and justice of all participants during the project implementation.

The project lead completed the Collaborative Institutional Training Initiative (CITI) program taught in the university, which contained material on the protection of personal data, keeping the participants free from harm, and maintaining the privacy of participants (see Appendix I). Data will show door-to-provider timeframes, number of patients transferred to a higher care level, pre- and posttest scores, and the reduction of adverse events. The assignment of random numbers means participants will not disclose their identities on the paper tests. Storage of all project material will be in encrypted files kept on a password-protected, personal computer. To prevent the appearance of coercion to participate, there will be no compensation for taking part in the project. In addition, the only minimal risk to participants is the slight chance of discomfort from taking part in education and testing. None of the chart audited will contain patient names or personal health information.

Plan or Analysis/Evaluation

Measuring the project will be with four samples, the first of which entails measuring the knowledge and skills of staff on the use of the triage protocol tool before and after education. A Wilcoxon signed-rank test will enable a comparison of participants' knowledge before and after training. As a paired difference test that compares two related samples or repeated measurements on a single sample to identify whether the mean ranks differ, a Wilcoxon signed-rank test is appropriate for the case (Couch, Kazan, Shi, Bray, & Groce, 2018). Following staff training and testing will be entry of the results into SPSS and generation of the final report.

Sample two is the overall door-to-provider time and transfers pre- and postimplementation. Conducting a Mann-Whitney test will allow the comparison of before-and-

after implementation to report the median and interquartile range. The reason for choosing the Mann-Whitney test is because the values will likely have some large outliers (Hart, 2001). For transfers, more than one value is required before and after the implementation. The number of transfers after implementation of the protocol tool recorded for the 4 weeks during project implementation of the project will have subsequent comparison to the number of transfers one month before implementation.

Sample three will involve collecting door-to-provider time for patients with abnormal vital signs and higher-acuity complaints. The *t-test* for this sample will show the difference in door-to-provider time before and after implementation. An independent sample *t-test* is appropriate in this case to test the difference between two independent groups. A *t-test* indicates whether there is a significant difference between the mean of two groups, which may be related in some way (Kim, 2015).

The use of sample four will be to measure the reduction in adverse events using a *t-test*. Comparison of pre- and postimplementation data will show if there has been a reduction in adverse events circumstances and how many patients received transfer to a higher level of care. Measurement of provider compliance will entail the use of a posttest. Providers considered compliant with the tool are those who score more than a 95% compliance level confidence interval. Calculation of the confidence interval will be with the Wilson procedure both with and without a correction for continuity (Newcombe, 1998; Wilson, 1927).

Significance/Implication for Nursing

Quality improvement projects in nursing have a significant influence on the current and future professional nursing practice, thus making them a vital component of the educational process (Moule, Aveyard, & Goodman, 2016). The DNP-prepared nurse will have succeeded in

translating research into practice. Reduction of door-to-provider time will encourage nurse leaders to keep improving the operations in urgent care by translating research to practice. A decrease in door-to-provider time has an overall impact on the entire health care industry, including reduction of complications and death rates, improved patient care efficiency, and a contribution to the reduction of adverse events (Anderson, 2019; Christensen et al., 2016; Jesionowski, Riordan, & Quatrara, 2019; Spencer et al., 2019). The project will also show the role of triage in mitigating overcrowding in the urgent care by ensuring patient throughput for the timely and appropriate level of care.

The nursing professionals will understand the role of triage in reducing the risks of hospital readmissions because patients who have abnormal signs will be a priority to see a provider. Abnormal vital signs put the patients at risk of readmission and death. Generally, the project will teach nurses that nursing practice will improve as they identify problems and use evidence to solve them. The project will also affirm current literature that has shown triage is essential in nursing care by reducing the number of deaths and complications in urgent care due to providers seeing patients with abnormal vital signs in a more timely and efficient manner. With the implementation of a successful triage protocol, the quality of care will improve. The monies spent due to complications and deaths that result from longer patient stays with abnormal vital signs in the urgent care will also decrease. Due to improved quality of care, the project site is likely to attract more patients and turn higher profits. If the project is successful, the project lead will have fulfilled the goal of translating research to practice. Achieving this goal benefits the nursing profession, as nurses take the lead role in developing protocols and implementing quality improvement projects to promote health and improve patient outcomes.

Data Analysis and Results

Provider Comprehension

The staff's knowledge and skills were evaluated before and after protocol training was provided using pre- and posttests. Provider comprehension was measured in terms of scores ranging from 0 to 100%, with 0% and 100% respectively being awarded to the provider with the least and highest comprehension. Results show that pre-test scores range from 85%-100% with an average score of 92.2%. The average score of provider comprehension of the posttest was 95.2%, which is higher than the average pre-test score, with scores ranging from 90% to 100% scores.

Furthermore, a 95% confidence level Wilcoxon Rank test for comparing means is an appropriate approach to assess whether provider comprehension improved after the test (Fong et al., 2018). The participants were tested before and after the implementation tool (see Table 2).

Null Hypothesis: Provider Comprehension is not affected by training

Mean (Pretest)-Mean (Pros*t-test*) =0

Alternative Hypothesis: Provider comprehension increased after training

Mean (Pretest)-Mean (Pros*t-test*) < 0

The probability value of the 95% *t*-statistic from the Wilcoxon Rank test of difference between scores pretest and posttest is 0.02 < 0.05 chosen alpha level of significance. Also, the 95% confidence interval of the difference in pretest and posttest scores is (-4.768, -1.232), (Learned-Miller, 2019). Zero is not included in the confidence interval. Hence, there is enough evidence to reject the null hypothesis at 95% confidence and conclude that provider scores are higher in the posttest (Kim, 2015).

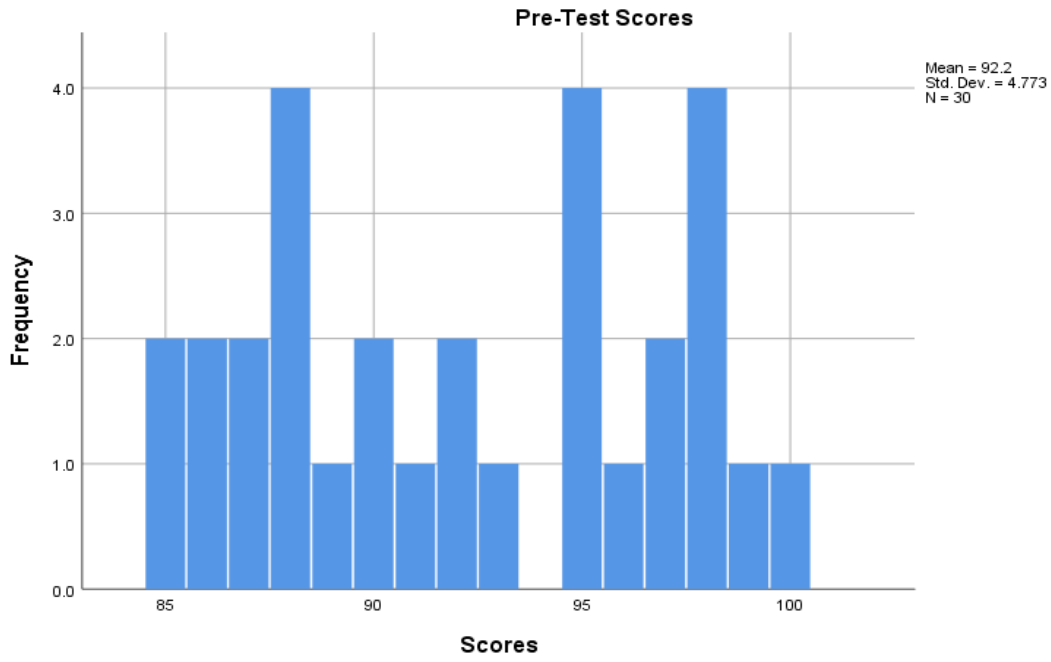

Figure 1. Service provider's scores before implementation of DNP project.

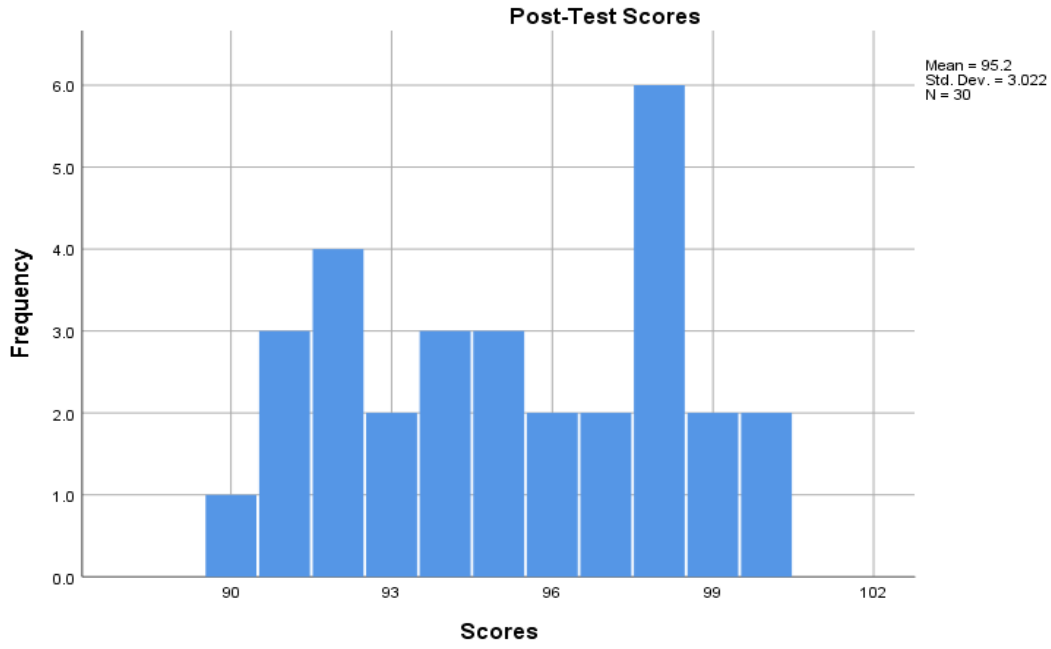

Figure 2. Service provider's scores after implementation of DNP project.

Table 2

Measures of Central Tendencies and Dispersion of the Service Provider's Scores Pre- and Posttest

	Pretest	Posttest
Mean	92.2	95.2
Mode	95	98
1st Quartile	88	92
Median	92	95
3rd Quartile	97	98

Table 3

SPSS Results of the t-Test for Paired Data of Service Providers' Scores Pre- and Posttest

```
T-TEST PAIRS=Pretest WITH Posttest (PAIRED)
  /CRITERIA=CI(.9500)
  /MISSING=ANALYSIS.
```

T-Test for comparing means

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	92.20	30	4.773	.872
	Posttest	95.20	30	3.022	.552

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pretest & Posttest	30	.329	.075

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pretest - Posttest	-3.000	4.734	.864	-4.768	-1.232	-3.471	29	.002

Provider Compliance

The results suggest a larger proportion of service providers were compliant with the use of the triage protocol (see Figure 3). The ratio of compliant providers to noncompliant service providers was found to be 3:2. This simply means that 60% of service providers who were involved in this project are compliant. However, this is not sufficient information to conclude that more service providers were compliant. Constructing a confidence interval of the proportion is an appropriate approach to confirm if there is a statistical significance in the proportion of the number of providers who are compliant and those who are noncompliant posttest. Fisher et al. (2011) proposed ratio tests and use of F-statistics to compare ratios in a sample. Fleiss et al. (2013) also agrees with Fisher's proposition. A 95% confidence interval for the proportion of compliant service providers was constructed and found to be the range (-42.42%, 75.41%), (see Figure 4). Since the 50% value of proportion is included in the 95% confidence interval, it is therefore concluded, at a 95% level of confidence, that the proportion of compliant service providers is equivalent to that of noncompliant service providers' posttest.

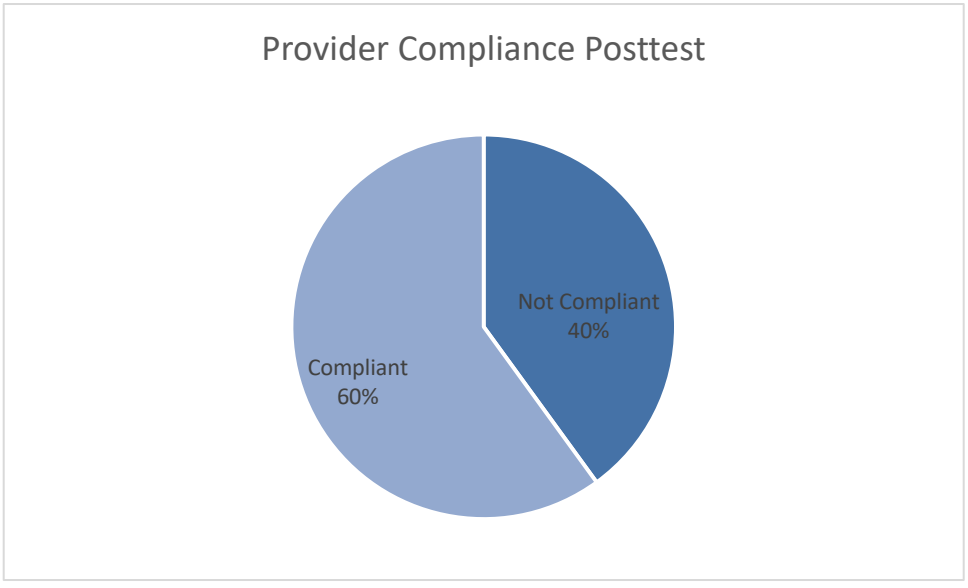

Figure 3. Proportion of service providers who were compliant and those who were noncompliant.

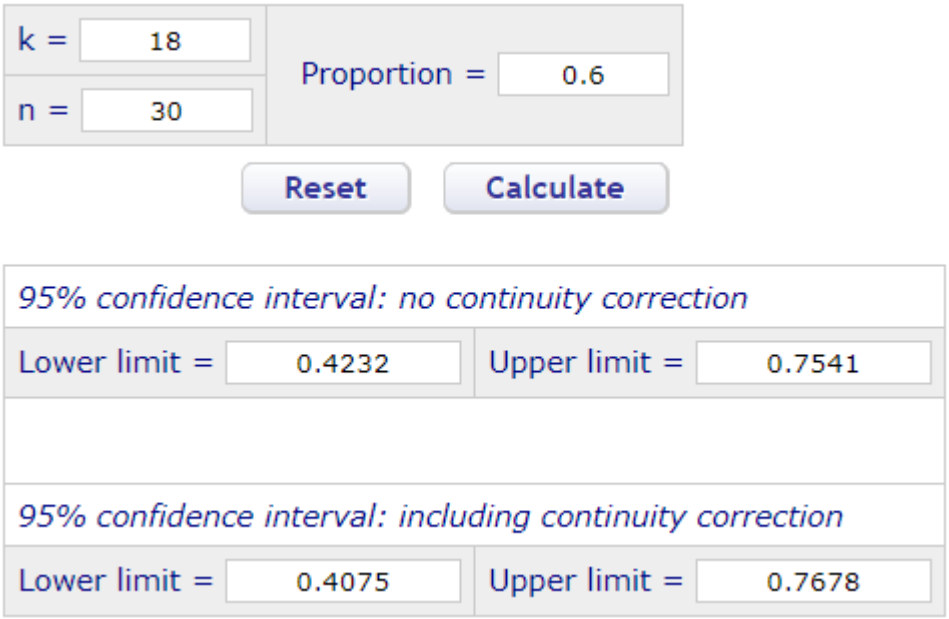

Figure 4. A snap of calculations of the 95% confidence interval.

Door-to-Provider Time

It is necessary to investigate the effects of the triage protocol to the waiting time between arriving in the facility and reaching the service provider. The average door-to-provider time was 59.817 minutes before implementation. This greatly reduced to 53.06467 after implementation. This 11% reduction in door-to-provider time after implementation indicates that implementation of the system has a significant impact in reducing the waiting time. Similarly, from Figure 4, the box plot of door-to-provider shifted from up to down, signifying that the waiting time has significantly reduced postimplementation (Dawson, 2011). The distributions of the door-to-provider time had some extreme low and high values (outliers). The outliers in the postimplementation door-to-provider distribution were not as large as those of the preimplementation distribution (Morgan, 2012). The range between the first and third quartiles before and after implementation was 1.6325 and 1.615, respectively (see Table 2 and Figure 4).

This indicates the door-to-provider time was relatively similar for post implementation compared to preimplementation.

The *t-test* for comparing means was conducted to test if there is a significant difference between the door to provide time before and after implementation.

Null hypothesis: Door-to-provider time is greater at preimplementation period compared to postimplementation period.

Alternative Hypothesis: Door-to-provider time is the same for preimplementation period and postimplementation period.

The probability value of the *t-test* for paired data for comparing means is $0 < 0.05$ chosen alpha level of significance. Hence there is not enough evidence to reject the null hypothesis (Mowery, 2011). It is therefore concluded at 95% confidence level that implementation reduces the door-to-provider time.

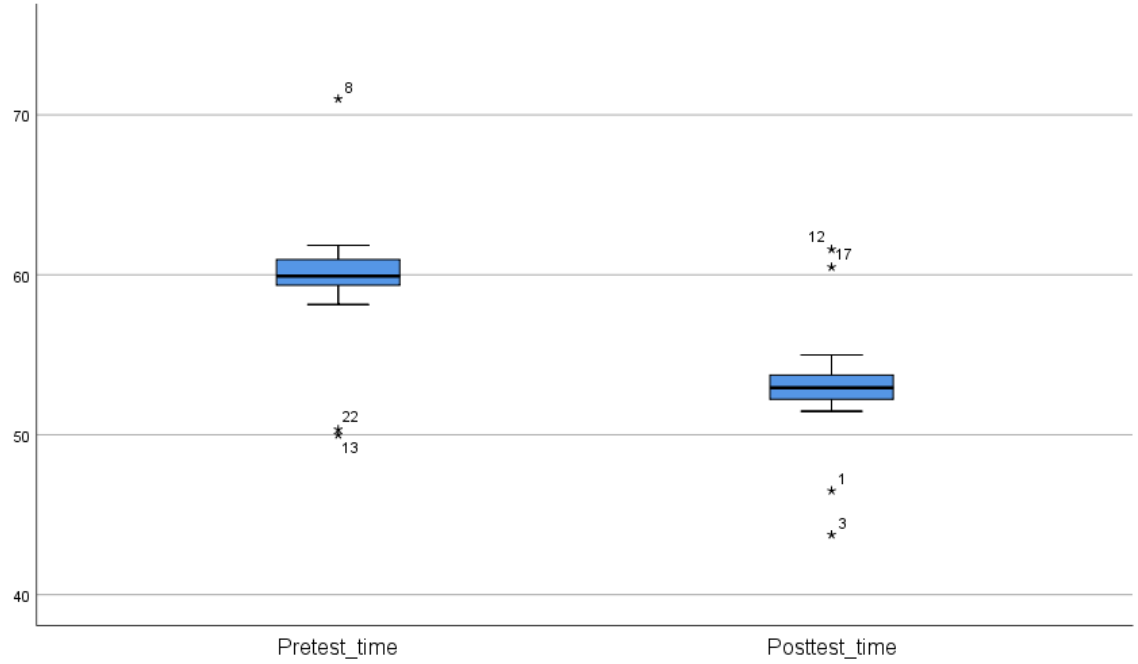

Figure 5. Distribution of door-to-provider time pre- and posttest.

Table 4

Measures of Central Tendency and Dispersion for the Distribution of Door-to-Provider Time Pre- and Postimplementation of the Test

	Preimplementation Door-to-provider time	Postimplementation Door-to-provider time
Mean	59.817	53.06467
Mode	59.41	53.53
1st Quartile	59.3325	52.1725
Median	59.92	52.94
3rd Quartile	60.965	53.7875
Inter-quartile range	1.6325	1.615

Table 5

SPSS Results of the t-Test for the Paired Data of Door-to-Provider Time Pre- and Posttest

```
T-TEST PAIRS=Pretest_time WITH Posttest_time (PAIRED)
  /CRITERIA=CI(.9500)
  /MISSING=ANALYSIS.
```

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest_time	59.8167	30	3.41801	.62404
	Posttest_time	53.0649	30	3.09620	.56529

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pretest_time & Posttest_time	30	-.034	.858

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pretest_time - Posttest_time	6.75178	4.68934	.85615	5.00075	8.50281	7.886	29	.000

Adverse Events

The number of transfers per hour pre- and postimplementation of the triage protocol was used to assess its impact on adverse events resulting in transfers to a higher level of care. The number of transfers were recorded for six hours before and after test. These numbers were compared at each time for the two periods. The number of transfers ranges between three to seven and between two to five before and after test, respectively, which suggests that more transfers happened in the preimplementation period (Perera, 2011). The average number of transfers per hour was five before implementation. This average was relatively reduced to three transfers per hour after implementation. A one-way analysis of variance was used to analyze the data set and test the significance of the impact of the test to the number of transfers (see Table 4 - ANOVA Table; Mrkvicka et al., 2016). The probability value of the F-statistic for the analysis of

variance is less than the 5% chosen level of significance. It is concluded that implementation of the test has significantly reduced the number of transfers. This implies that the facility services have improved due to implementation of the protocol. It is concluded that the triage protocol reduces adverse events resulting in fewer transfers to a higher level of care.

Table 6

A One-Way ANOVA Table for the Number of Hourly Transfers Pre- and Posttest Recorded for 6 Hours

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Pretest transfer	6	33	5.5	2.7
Posttest transfer	6	18	3	1.6

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	18.75	1	18.75	8.72093	0.014457	4.964603
Within Groups	21.5	10	2.15			
Total	40.25	11				

Discussion

The overall outcomes of the data analysis indicated the implementation of a triage protocol resulted in a significant reduction in door-to-provider time, increased knowledge in prioritization skills among health care staff, and reduced adverse events in the urgent care setting. However, despite the significant changes, some project objectives were not met because the changes were not substantial enough to meet the project lead's target. The findings also indicated that a significant number of the recruited health care staff did not adopt the

implemented triage protocol. Therefore, the failure to attain the target can be attributed to the fact that 40% of participants failed to adhere to the implemented protocol. Possible reasons for non-compliance are: not all nurses attended the training and maximum level of comprehension after the training was not achieved.

The pre- and posttests measurement of the staffs' level of comprehension indicated a positive change in the average score of employee comprehension of the triage protocol, in regards to the vitals needed to be taken to determine patients' urgency of care, and how to interpret these findings. The average score of provider comprehension of the posttest was 95.2%, which was an improvement from 92.5% before the implementation. That could be attributed to increased patient knowledge after triage protocol training and increased staff experience during project implementation (Ebrahimi et al., 2016). The positive change was an indicator that this objective was met because, at the start of the project, the project lead had specified the level of positive change that would be considered adequate for the project was a post-intervention score of 95%.

The *t-test*s of the door-to-provider time indicated the waiting time between arriving in the facility and reaching the service provider after the implementation of triage protocol reduced from 59.817 minutes to 53.06467, an 11% reduction. This change was an indicator that wait time and overcrowding in the urgent care setting reduced and there was increased efficiency in the delivery of health care services. These results indicate that implementing the triage protocol increases efficiency in the urgent care setting (Harding, Taylor, & Leggat, 2011). However, this could be attributed to other factors, such as an increase in the number of health care providers and a reduced number of patients seeking treatment. Although the recorded change was significant enough to be considered in health care decision making, it was insignificant for this

project. At the beginning of the project, the objective was a 45% reduction in door-to-provider wait time. Therefore, this objective was not met, which may indicate that the target objective was set too high (Reinhardt, 2017). The below expectations outcomes may be related to the fact that only 60% of health care staff recruited for the study adhered to the triage protocol.

The one -way ANOVA test indicated the average level of adverse events reduced from five to three per hour after implementation of the triage protocol. This was a 40% reduction. Although the change was significantly high, it did not meet the objective of this project. The project had set the objective to be a 50% reduction in patients' adverse events after the implementation of the triage protocol. Therefore, cases of adverse events occurring in the urgent care setting reduced after the implementation of triage protocol (Kizer & Stegun, 2007). The findings, therefore, indicate that only one project objective was met, while two objectives were not met. Although some of the project outcomes did not align with the project objectives, they align with the current literature on the role of triage protocol in the urgent care setting (McEvoy, Wiles, Berhardsson, & Grimmer, 2017). Therefore, the project findings indicate that implementation of a triage protocol results to a significant reduction in door-to-provider time, increase in knowledge of prioritization among health care staff and reduced adverse events in the urgent care setting.

Significance

The current project is significant to the nursing field. The nurses realize they have a role in utilizing their advanced training skills to identify areas for improvement within their health care setting. As primary care providers, they are more familiar with organization systems, process, and patients' needs than any other practitioner. Therefore, they are best suited to propose and engage in designing effective strategies to mitigate the identified gaps (Mackinson

et al., 2018). The project also allows nurses to realize the need for constructing these proposals on evidence-based findings, to ensure only proposals that have been tested and proven to be effective are implemented (Thoma, Seifert & Joyner, 2016).

The project implementation process equips nurses with skills needed in implementing future changes and helps them realize that implementation of every project has its own unique risks, which, if not mitigated, could impair the implementation process (Scott, 2018). Through the project proposal, nursing leaders realize that they have a role in serving as change agents in their respective health care setting. To adequately serve in this role, they need to be open-minded in regards to welcoming new ideas proposed by subordinates to improve quality patient care (Rafferty, 2018). They also need to motivate the subordinates to be more innovative and creative by ensuring access to research materials and providing financial resources needed for research activities (Duffey, 2017). Undertaking these roles enables nurses to produce continuous quality and safety improvement in health care settings through change proposal.

Limitations

The project used a quality improvement design, which presented two significant limitations to the project. The proposed triage protocol was tested on a single health care organization. Considering the variation in settings and populations of urgent care facilities in the region, the design might impair the application of project interventions in other facilities after dissemination (Caro & Kyriakides, 2019). There is, therefore, no guarantee that the triage protocol will yield identical outcomes if applied in a different urgent care facility (Yeoh et al., 2018). The second limitation is the short project implementation time frame. The four to six-week timeframe was inadequate to accurately determine the long-term impact of the triage protocol on quality of care and patient wait time (Moule, Aveyard, & Goodman,

2016). Additionally, the project period left limited time to deliver provider education and evaluate the efficacy of the teaching method. More time would have allowed for sufficient training, enabling the assessment of the teaching methods to identify areas of improvement for facilitating better comprehension, thus contributing to increased compliance. Therefore, the limitation contributed to reduced compliance to the triage protocol. Training care providers for at least one month would have resulted to a compliance rate higher than 60%.

When performing data collection and analysis, the project lead failed to consider how the care providers' level of education and experience would impact their comprehension of and adherence to the tool (Sacino et al., 2016). Recruited health care providers had different education attainments and varying years of experience. Health care providers with advanced education, such as doctoral and Master's in nursing degrees, and those with more experience are likely to show greater comprehension and adherence to the triage protocol due to their advanced competencies (Worth, 2017). In comparison, providers with nursing degrees only could require prolonged training to achieve adequate comprehension of the triage protocol.

Dissemination

Promoting greater reach and application of the project findings will entail disseminating the project in multiple areas (Worth, 2017). For assessment purposes, the instructor will receive a copy of the project details and results. The school policy encourages publication of DNP projects in the online DNP repository, thus promoting the online sharing of the project (Moran, Burson, & Conrad, 2016). The project will, therefore, be accessible to all nursing students and stakeholders. Sharing of the project in the Los Angeles County study site urgent care facility will be through poster publications available on the notice boards, thus allowing all care providers to access the project (Williamson & Whittaker, 2019). The project will also be available at annual

national quality improvement workshops organized by the American Association of Nurse Practitioners (AANP). The nursing workshop is scheduled to take place in June 2021 at the Ernest N. Morial Convention Center in New Orleans, Louisiana. All conference attendees will receive a brochure highlighting the results of the project (White & Zaccagnini, 2017).

This project will be sustainable within the urgent care setting because it aligns with the current needs of health care organizations, including improving the quality and safety of care and reducing the length of hospital stays. To further reinforce the project, health care organizations will integrate the triage protocol into their culture by designating it a policy. The cost-effectiveness of the triage protocol fosters sustainability, especially due to the rising need to cut costs in the health care setting. Study implementation would require only staff training on the tool, with no additional cost of medical materials. The triage protocol is, therefore, convenient for both small and large health care facilities.

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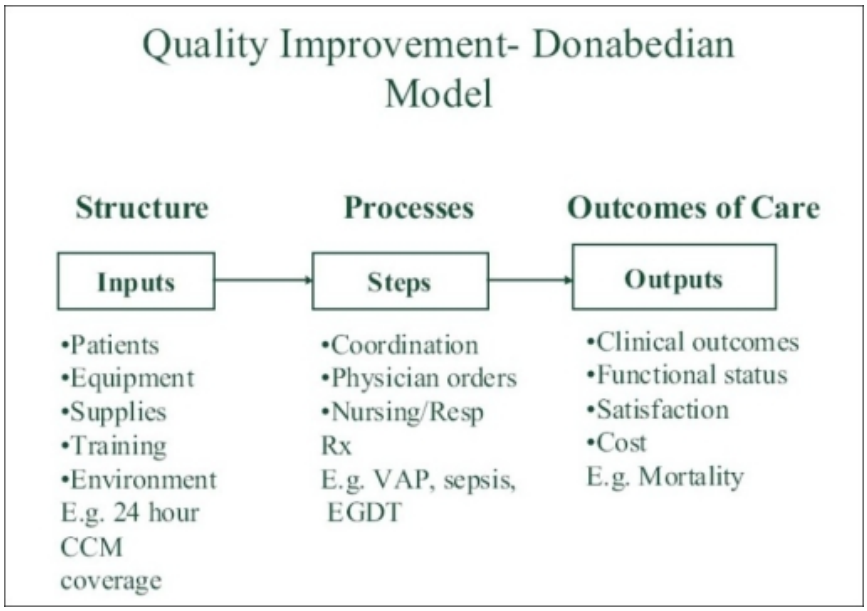
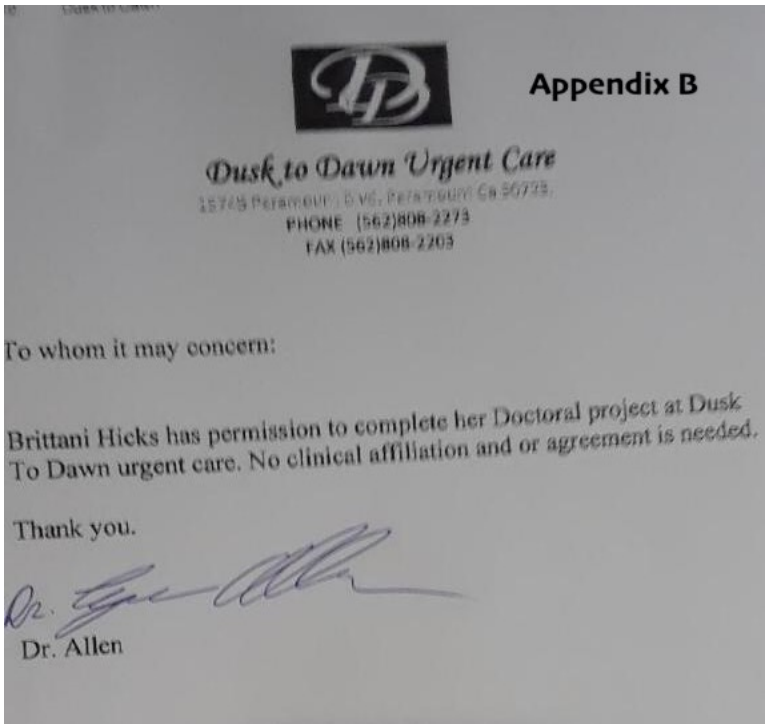
Appendix A:

Conceptual Model



Appendix B:

Permission to Conduct Study



Appendix B

Dusk to Dawn Urgent Care

15745 Paramount Blvd, Paramount Ca 90723

PHONE (562)808-2273

FAX (562)808-2203

To whom it may concern:

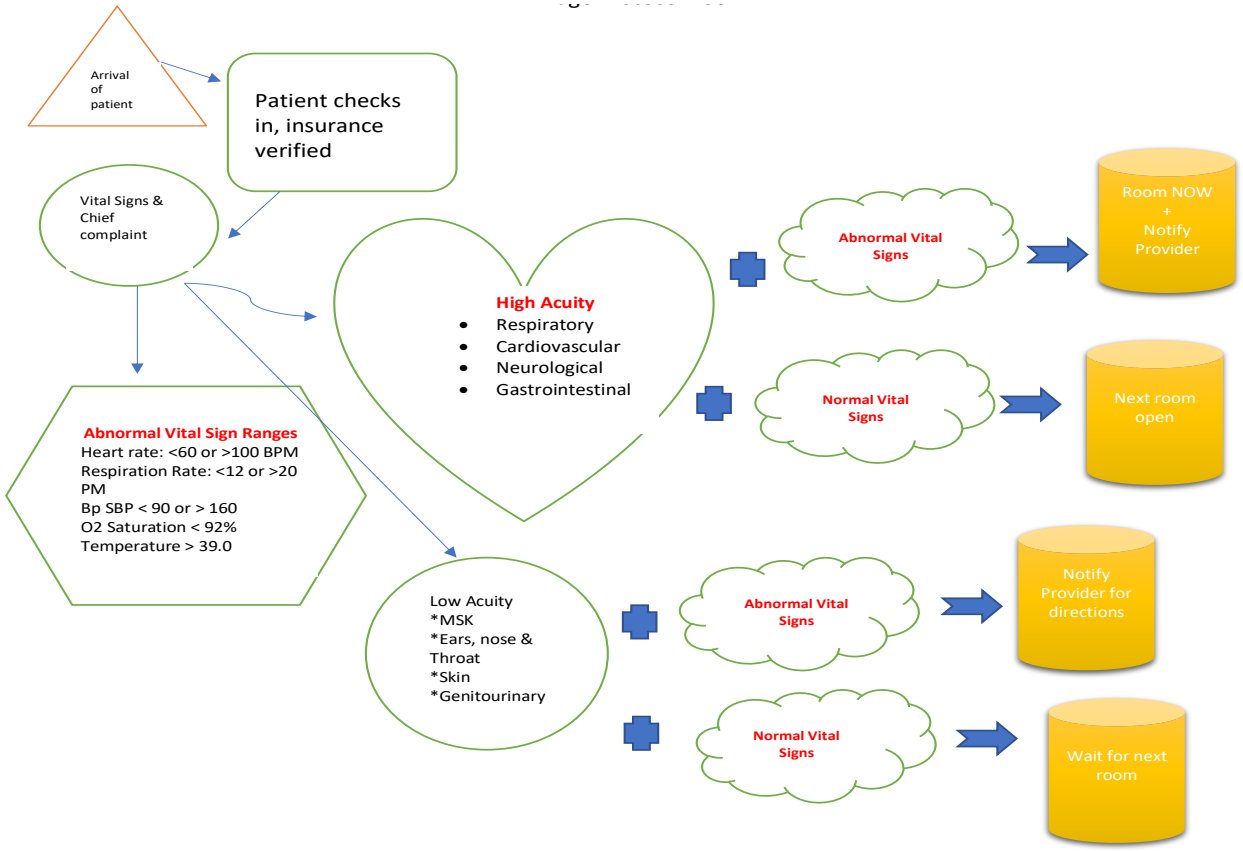
Brittani Hicks has permission to complete her Doctoral project at Dusk To Dawn urgent care. No clinical affiliation and or agreement is needed.

Thank you.

Dr. Allen

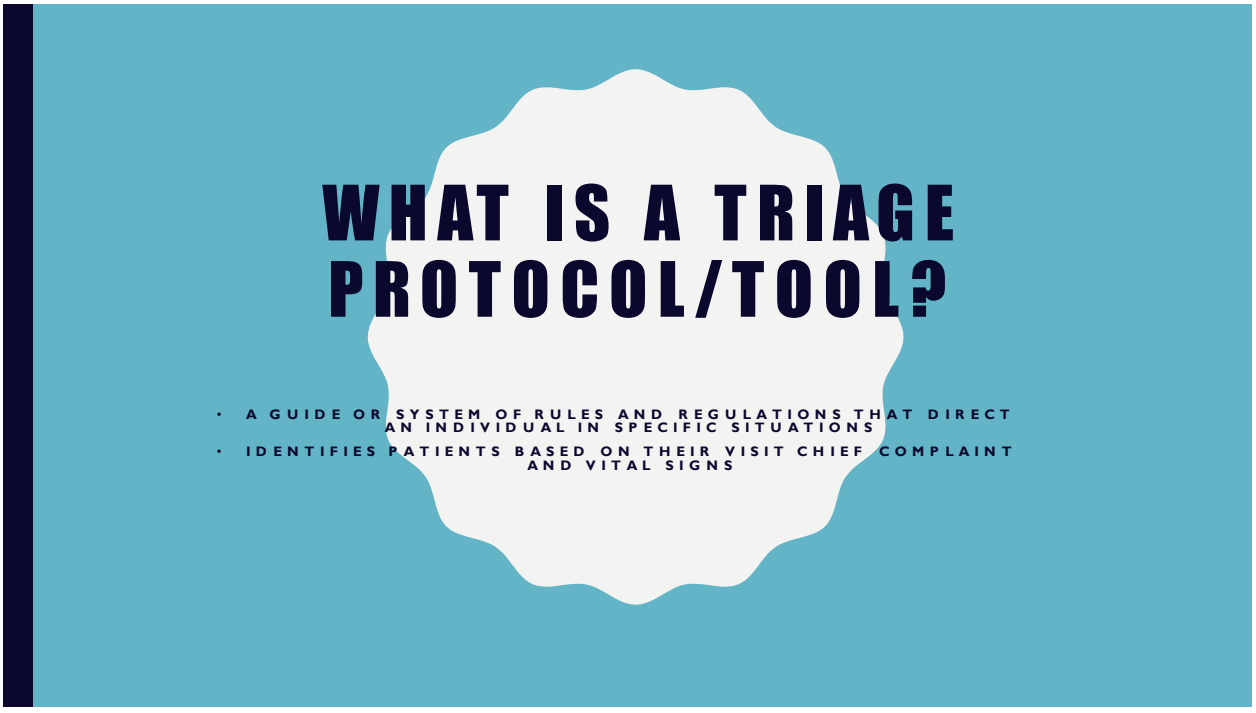
Appendix C:

Triage Protocol Tool



Appendix D:

Educational Presentation



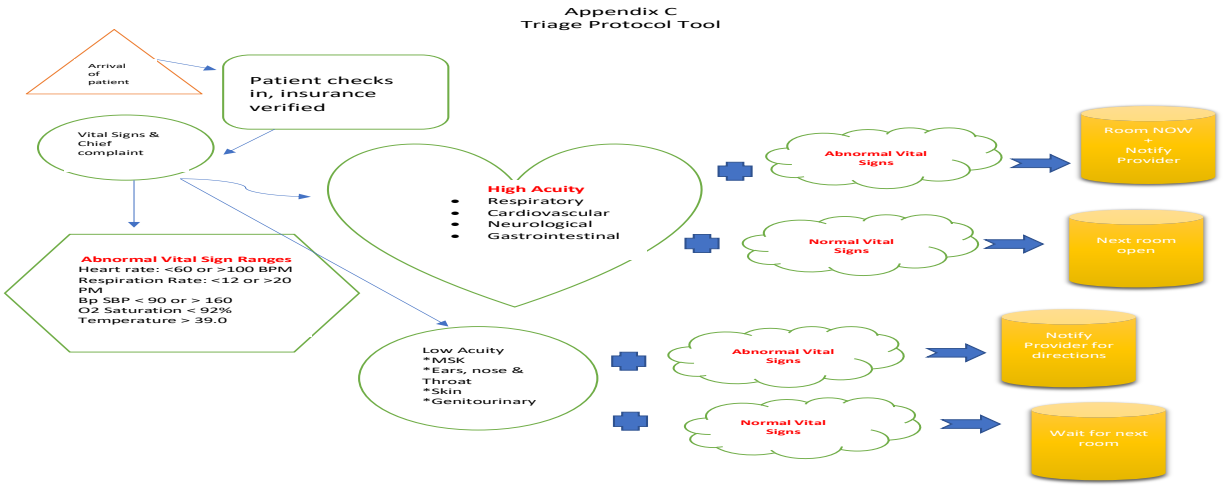
WHAT IS A TRIAGE PROTOCOL TOOL?

- A flow chart that aids the clinic staff to follow steps to guide them based on the patients data and information
- The flow chart includes low and high acuity chief complaints dependent on the location of the illness, along with vital signs that are abnormal

OVERVIEW

- Overcrowding in the emergency department is a common scenario across the globe.
- Patients admitted to hospital often die in 24hours of admission
- These deaths can be prevented if the if the very sick patients are identified a soon after arrival and treatment is started immediately.
- Patients have to wait for long time before seeing a provider or before being transferred to a hospital bed .
- The result is not only inconvenience but a degradation of the whole care experience.
    - Quality of care is compromised.
    - Patient safety is endangered.
    - Staff more is impaired.
    - The cost of care also increases.
- These problems can be prevented by implementing a triage protocol in the urgent care.

(Harding,,Taylor, & Leggat, 2011).



IF YOU ARE UNSURE….

- Ask the Healthcare provider
- Our Goals are to:
  - Reduce adverse events
  - Increase the safety of the patients
  - Reduce door to provider time

REFERENCES

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Appendix E:

Pre- and Posttest

Created by Dr. Nhia Yang

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 dd) d)Recheck the set of vitals then decide what to do based on the algorithm

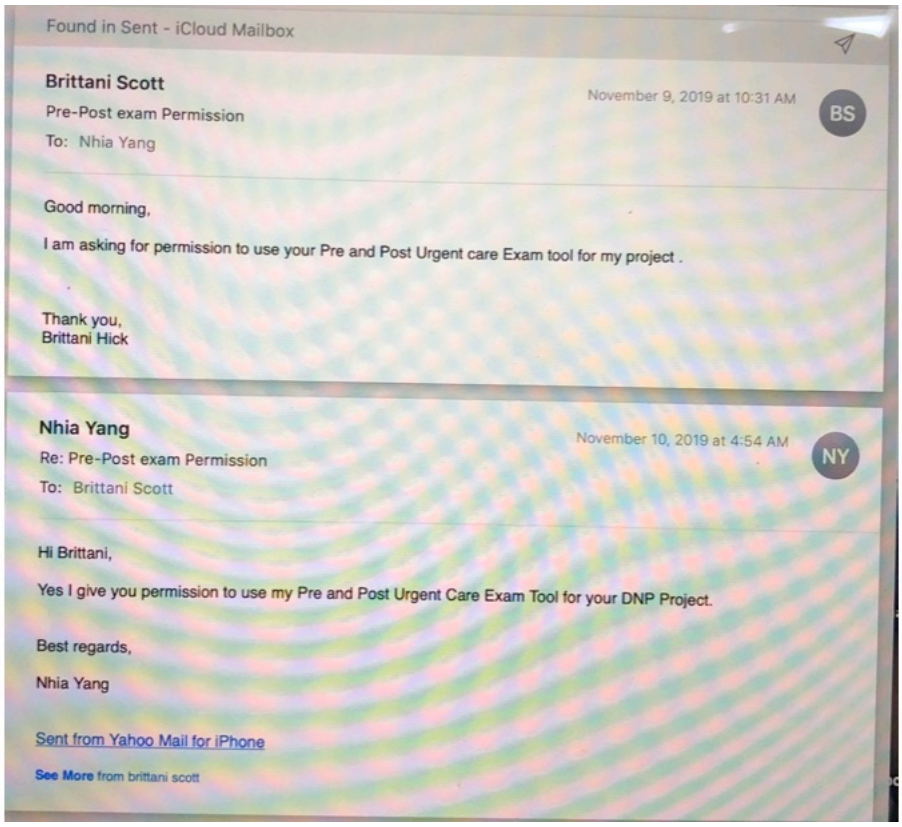
4	**A healthcare professional currently performing a set of vital signs on a patient with complaints of epistaxis, understands that she has to immediately notified a healthcare provider when she saw the following vital sign reading:** a) HR 98, R 20, BP 122/70, Temp 36.2 Pulse Ox 99% RA b) HR 78, R 18, 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

	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:

Permission to Administer Pre- and Post-Urgent Care Exam Tool



Found in Sent - iCloud Mailbox

Brittani Scott November 9, 2019 at 10:31 AM

Pre-Post exam Permission

To: Nhia Yang

BS

Good morning,

I am asking for permission to use your Pre and Post Urgent care Exam tool for my project .

Thank you,
Brittani Hick

Nhia Yang November 10, 2019 at 4:54 AM

Re: Pre-Post exam Permission

To: Brittani Scott

NY

Hi Brittani,

Yes I give you permission to use my Pre and Post Urgent Care Exam Tool for your DNP Project.

Best regards,

Nhia Yang

Sent from Yahoo Mail for iPhone

See More from brittani scott

Appendix G:

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 H:

Chart Audit Tool

Patient initials: _____

Date of encounter: _____

Arrival Time: _____

DOB/Age: _____

Chief complaint:_____

Vital Signs:

BP___/___HR _____ Respiration_____ Temp _____ 02_____ _

Circle one: Acuity Level – High Low
Time patient was room: _____

Time provider saw patient: _____

Plan of Action/Orders carried out:
_____

Outcome: (circle one)

Improve Stable Worsen

Recommendation and time of discharge: (circle one and write down time of recommendation)

Discharge _____
Transferred to higher level of care _____ Left AMA _____

Provider Initial: _____

Appendix I:

CITI Completion Certificate