Implementing a Trauma Consult Protocol for Geriatric Trauma Patients

Lorraine E. Kelly

College of Nursing, East Carolina University

Doctor of Nursing Practice

Dr. Dianne Marshburn

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Abstract

Geriatric patients are at increased risk for death due to undertriage after a trauma. The purpose of the quality improvement project was to implement a geriatric trauma consult protocol on the elderly population aged 70 and over to identify occult injuries and decrease complications. At the project site, the majority of geriatric trauma patients with a single site injury such as a hip fracture are classified as a level IV trauma. Level IV trauma patients are rarely seen by a member of the trauma team. The inclusion criteria for the project were level IV trauma patients aged 70 years and older with a single site injury admitted under inpatient status by the designated hospitalist group. The hospitalist physician initiated the trauma consult. The project was guided by the Institute of Health Model for Improvement framework and the American College of Surgeons Committee on Trauma recommendations. The protocol was implemented over 14-weeks with biweekly PDSA cycle review and protocol updates. The findings show that 32% of the eligible patients received a trauma consult with zero occult injuries identified. There were no complications in the patients that received a trauma consult. One unplanned ICU admission and four urinary tract infections were recorded in the patients with no trauma consult. The project aligns with the Triple Aim and Healthy People 2030 by providing increased access to care which improves patient experience, improves the health of the aging population, and decreases costs by identifying injuries or illness prior to costly complications.

Keywords: geriatric trauma, undertriage, level IV trauma, trauma team consult

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Section I. Introduction

Background

The American College of Surgeons Committee on Trauma (ACS-COT) provided guidance on the optimization of geriatric trauma care through its Trauma Quality Improvement Program in 2013. The geriatric population can have a two-fold risk of death from under triage after a trauma (ACS-COT, 2013). Current trauma activation protocols may lead to undertriage of the geriatric population causing a delay in treatment of a significant injury. The American College of Surgeons (ACS) recommends an undertriage rate of 5% or less when using the Injury Severity Score of 16 or more to define trauma or 1% if using a method that identifies possible preventable deaths (ACS-COT, 2014). The geriatric population needs different parameters when assessing the need to activate a trauma due to changes in physiological response from the aging process, comorbid conditions, or medications (ACS-COT, 2013). Geriatric patients with significant head injuries may present with mild symptoms and an unpredictable Glasgow Coma Scale (Llompart-Pou, et al., 2017). Trauma death in the geriatric population is most frequently caused by falls from any level, including ground level low impact falls (Llompart-Pou et al., 2017).

The organization in the quality improvement project is a public not-for-profit hospital that supports a seven-county region in Southeastern North Carolina and is the only Level II trauma center (NHRMC, n.d.-b). The organization's mission is to lead the community to outstanding health through a set of four values: compassion, ownership, teamwork, and communication (NHRMC, n.d.-a.). The organization is the Southeastern Regional Advisory Committee (SERAC) on trauma, representing one out of eight regions in North Carolina (NHRMC, n.d.-b). Through SERAC, the organization serves as the lead for performance

improvement through data collection, data sharing, education, and policy/program development with the goal of zero preventable deaths due to trauma (NHRMC, n.d.-b.).

Organizational Needs Statement

As the regional leader in trauma services and performance improvement, the organization wants to implement a geriatric trauma consult protocol to capture geriatric level IV trauma patients with significant injuries that may have been missed on initial assessment in the emergency room. Each trauma center determines the criteria for the level of trauma activation within their institution. The institution has a protocol in place specifying the criteria for level I, II, and III trauma activations. The ACS-COT guidelines specify the timeframe for trauma team response for level I and II trauma activations upon patient arrival to a medical center (ACS-COT, 2014). At this institution, level III traumas are activated as a trauma team consult and level IV trauma patients are classified as patients that do not meet trauma I-III criteria but are included on the trauma registry. Currently most of the geriatric trauma level IV patients are admitted by medicine or orthopedic services at the hospital. The majority of level IV trauma patients have a single site injury sustained in a ground level fall. Implementing a geriatric trauma consult protocol will give the trauma team an opportunity to complete a tertiary assessment on level IV trauma patients with a single site injury. The new trauma consult protocol on level IV trauma patients should decrease unplanned ICU admissions and mortality in this cohort.

The organization desired to initiate a quality improvement project that would improve outcomes in the geriatric level IV trauma patients and meet the recommendations of the American College of Surgeons. Implementing a geriatric trauma consult protocol should have a positive impact on further decreasing hospital mortality rates. A geriatric trauma protocol will help eliminate a health disparity by achieving health through policy formulation, which is a foundational principle in the framework for Healthy People 2030 (Office of Disease Prevention

and Health Promotion, 2020). Healthy North Carolina 2020 includes an injury focus area that targets reducing the unintentional falls mortality rate per 100,000 (Division of Public Health, 2019). A geriatric trauma protocol should reduce unintentional falls mortality rate, hospital mortality rate and eliminate a health disparity by identifying patients with significant injuries and increasing access to needed care.

Instituting a geriatric trauma consult protocol aligns with the Institute of Healthcare Improvement (IHI) Triple Aim framework for improving healthcare performance. The Triple Aim framework includes three dimensions for process development and improvement through patient experience, health of populations, and reducing healthcare costs (IHI, 2020a). A new trauma consult protocol recognizes the needs of the geriatric population. It would positively impact patient experience by activating timely rapid access to specialized care such as trauma surgery, imaging, diagnostics, and treatments. Providing more rapid access to care through trauma consultation should improve population health by identifying undertriage patients leading to decreased mortality and years of healthy life lost. The new protocol will increase trauma consults in the geriatric population and help decrease preventable deaths from falls through early detection of significant injuries. Trauma consults will increase initial healthcare costs due to increased resource utilization, including increased personnel, rapid diagnostic testing, and sometimes increased testing. Reduction in healthcare costs could be decreased by implementing a geriatric trauma protocol resulting in early intervention that should impact costs related to delays in care, hospital complications, and unplanned ICU admissions.

Problem Statement

Currently, the majority of geriatric level IV trauma patients are admitted to the medicine or orthopedic service without ever being seen by the trauma service. The organization needs to

implement a geriatric trauma consult protocol that captures undertriaged geriatric trauma patients as recommended by the ACS-COT. The geriatric trauma consult protocol should identify undertriaged elderly level IV trauma patients and provide them with timely access to needed care while decreasing unplanned ICU admissions and mortality.

Purpose Statement

The purpose of the proposed DNP project was to implement a geriatric trauma consult protocol for the elderly population aged 70 and older to be initiated by the hospitalists that will decrease unplanned ICU admissions and mortality rates.

Section II. Evidence

Literature Review

A literature review of current knowledge was conducted using the database PubMed using the PICO format. The database was searched to answer the PICO question, "In geriatric trauma patients with falls, does a trauma consult compared to no trauma consult affect hospital complications and mortality?" The keywords used in the literature search were elderly, trauma, falls, undertriage, trauma consult, hospital complications, mortality, and unplanned ICU admissions after trauma. Articles were filtered only to include less than five years old and in the English language. The search resulted in 37 articles. Abstracts were reviewed. Articles were excluded that were not peer-reviewed, were specific to a disease process, were not related to geriatric trauma triage, prevention of complications related to falls, geriatric trauma, or the elderly hospitalized after a fall. Articles retained included level I, II, or IV evidence using the Melnyk Hierarchy of Evidence. They included process improvement of the geriatric trauma patient during triage, hospital management, prevention of falls or hospital complications. In narrowing the search based on inclusion criteria, eight articles were retained. An ancestry search of the reference list of the articles retained was conducted to assess for additional articles meeting the search criteria that did not result in the PubMed search. This search resulted in an additional three articles for a total of eleven. The articles are detailed in Appendix A. These articles were then read in their entirety to gain current knowledge of implementing a trauma consult protocol specific to the geriatric population not meeting trauma activation that are listed on the trauma registry.

Current State of Knowledge

Best practice guidelines for geriatric trauma treatment titled *Resources for the Optimal Care of the Injured Patient* and *ACS TQIP Geriatric Trauma Management Guidelines* published

by the Committee on Trauma from the American College of Surgeons are the guidelines used by trauma centers to establish care guidelines (ACS-COT, 2013 & 2014). The literature search produced retrospective reviews of outcomes in the geriatric trauma population using trauma registries that are maintained by all trauma centers. The literature search did not produce current research showing the effectiveness of trauma team intervention on level IV geriatric trauma patients. Several measures such as undertriage, overtriage, emergency room length of stay, ICU utilization, emergent surgery needs, hospital length of stay, complication rates, and mortality have been retrospectively reviewed in an attempt to validate the implementation of a geriatric trauma protocol (Bardes et al., 2019; Cull et al., 2019; Fernandez et al., 2019; Hammer et al., 2016; Ringen et al. 2019).

Bardes et al., 2019, completed a retrospective review of 739 patients aged 70 and older with a traumatic injury to determine if age alone should be a trauma activation criteria. Variables collected to assess the need for age to be an inclusion criterion for trauma activation included overtriage, mortality, ICU admissions, ICU, and hospital length of stay. The 70 and over age group had an ICU admission rate of 56.6% and a mortality rate of 9%. An overtriage rate for the age 70 and over cohort was 39.6% after calculating out patients meeting several criteria. The ACS-COT recommends an overtriage rate of 35% or less (ACS-COT, 2014). The Bardes et al. study shows that adding age as a criteria for trauma activation with trauma team intervention does not increase overtriage rates to an unacceptable level and could decrease ICU utilization and mortality by identifying individuals with significant injuries that do not meet the standard trauma activation criteria.

Current Approaches to Solving Population Problem(s)

Strategies to prevent complications from injuries sustained from low-level falls in the elderly population have been implemented in the prehospital, hospital, and post-hospital setting. The Eastern Association for the Surgery of Trauma (EAST) practice management guideline for preventing fall related injuries in the elderly recommends implementing a strategy to prevent injury. Methods recommended by EAST include vitamin D and calcium supplements, hip protectors for the frail elderly, evidence-based exercise programs, modification of the physical environment, frailty screening, and risk reduction programs for high-risk groups (Crandall, et al., 2016). Geriatric trauma activation and trauma consult protocols have been implemented in the prehospital setting and in the emergency room. Emergency medical service (EMS) providers and emergency room physicians usually have an algorithm or protocol to determine if a trauma activation needs to be initiated. Geriatric trauma protocols have been implemented by introducing geriatric specific parameters into the algorithm, such as systolic blood pressure less than 110 instead of less than 90 (Brown et al., 2015). When adding blood pressure parameters, different healthcare organizations have used different age ranges as a parameter, such as 65 and older or 70 and older (Hammer et al., 2016). Age has been added to some hospital geriatric trauma protocols that increase the trauma activation to the highest level when the trauma patient meets the geriatric age criteria (Carr et al., 2018). One hospital system implemented a geriatric trauma triage algorithm that used the mechanism of injury as the first metric in the assessment of trauma activation instead of the standard physiologic indicators such as decreased blood pressure or injury severity score (Cull et al., 2019). The retrospective study included 4,341 patients and showed an undertriage rate of less than 4% and an overtriage rate of less than 40% in geriatric patients with falls (Cull et al., 2019).

Brown et al. (2015) assessed trauma activation rates, undertriage and mortality rates when increasing blood pressure parameters in a prehospital trauma protocol from systolic blood pressure of less than 90 mm Hg to a systolic blood pressure less than 110 mm Hg in subjects older than the age of 65. This retrospective review of 1,555,944 trauma patients using the National Trauma Data Bank for the years 2010-2012 showed a decrease in undertriage in the geriatric population by 4.4% with an increase in overtriage of 4.3% (Brown, et al., 2015). The geriatric mortality rate did not reveal any significant decrease with the change in blood pressure parameter but did show mortality rate to be near that of the same population in the less than 90 mm Hg group (Brown et al., 2015). The decrease in undertriage rate and a mortality rate close to equal in the systolic blood pressure of 90 mm Hg shows that increasing systolic blood pressure parameters can be a good indicator for the need for trauma activation in the geriatric population.

Geriatric trauma protocols in the prehospital and emergency room include escalating individuals who do not meet regular trauma activation parameters but take anticoagulants or antiplatelet medications (Mason et al., 2017). A decrease in geriatric trauma mortality can be accomplished through the utilization of a multidisciplinary inpatient trauma team (Ringen et al., 2019). The ACS-COT (2014) recommends consulting a geriatric specialist early in the hospitalization or adding a geriatric specialist to the multidisciplinary trauma teams. Multidisciplinary trauma teams may include physicians, advanced care practitioners, physical therapists, occupational therapists, speech pathologists, pharmacists, dieticians, social workers, and geriatricians.

The organization currently has an inpatient multidisciplinary trauma team. The organization needs to implement a geriatric trauma consult protocol for level IV patients that addresses the needs of the geriatric population to help decrease undertriage and delays in care.

The hospital has implemented a geriatric trauma activation protocol by implementing trauma activation in individuals age 65 or older with a mechanism attributed to trauma other than ground level falls. The protocol resulted in overutilization of personnel. The protocol was revised to allow EMS to use their clinical judgment to consider activating a level II trauma in individuals aged 65 or over with a traumatic injury. The hospital currently has a geriatric trauma protocol that increases the activation level in patients 65 or older with confirmed systolic blood pressure less than 110. A new geriatric trauma consult protocol is being implemented for level IV trauma patients age 70 or above, including a tertiary assessment by the trauma team within 24 hours of admission to capture patients with significant injuries. Geriatric trauma patients may not meet trauma activation (level I or II) or trauma consult (level III) on initial presentation with EMS or arrival to the emergency room and have the potential to be undertriaged.

Evidence to Support the Intervention

Several studies have assessed the addition of geriatric parameters into a trauma triage protocol using the age criteria of 70. Carr et al. (2018) did a retrospective review to assess the impact of implementing a trauma protocol that increased the trauma to Level 1 in all individuals age 70 and older with a traumatic injury. The study reviewed a two-year pre and three-year post-implementation period with 4,341 patients who met the inclusion criteria. The outcomes assessed were mortality and hospital length of stay. The benefit of increased trauma to Level 1 activation was not statistically significant until after the age of 77 on mortality rates and after the age of 78 on length of stay (Carr et al., 2018). Indiana University Health Methodist Hospital instituted a trauma activation policy for individuals age 70 years and older in their emergency rooms statewide that elevated the trauma activation to the highest level available with no additional parameters (Hammer et al., 2016). Hammer et al. (2016) completed a retrospective

study to assess the impact of the geriatric policy on mortality using pre and post review of 2,269 patients. The change in policy to escalate patients aged 70 and over to the highest level of trauma activation did result in an average shorter emergency room length of stay of fewer than two hours and decreased odds (odds ratio, 0.689; 95% confidence interval, 1.088-2.394) of in-hospital mortality (Hammer et al., 2016).

Fernandez, et al. (2019) completed a retrospective review of geriatric trauma patients with low impact injuries not meeting trauma activation to assess the success of an expedited geriatric trauma triage. The review indicated 49.2% of the geriatric trauma registry patients were included in the expedited triage, which showed a decrease in time to initial evaluation, imaging, and emergency room length of stay. The review did not reveal an improvement in mortality in this cohort after initiating the expedited trauma triage in the emergency room.

Evidence-Based Practice Framework

The DNP quality improvement project implementing a geriatric trauma consult protocol was guided by the Institute of Health (IHI) Model for Improvement framework developed by Associates in Process Improvement (API) (API, 2020) (IHI, 2020b). This model was selected because it can be effective for short quality improvement cycles used in this project. The Model for Improvement includes three fundamental questions and utilizes the Plan-Do-Study-Act (PDSA) cycle developed by W. Edwards Deming (IHI, 2020b). The three fundamental questions in the Model for Improvement include: what the organization is trying to accomplish, how will the organization know if an improvement has been made, and what is the change that can be implemented to result in an improvement (API, 2020). Deming's PDSA cycle begins with step one, the planning phase, and starts with an idea for change, and developing the change or tool (Deming, 1993). Step two is the do phase, when the change is implemented for a short period of

time or on a smaller scale (Deming, 1993). Step three is the study phase, when the outcomes are reviewed for the perceived change, met or unmet expectations, what is learned from the outcomes, and what went wrong and needs to be changed (Deming, 1993). Step four is the act phase, where the change can be adopted or implemented on a larger scale, or the process reworked and the cycle rerun or abandoned altogether (Deming, 1993). Deming's PDSA model is a cycle that can rapidly improve a product or process by studying results and adapting the process or abandoning the process and by repeating the cycle again (Deming, 1993).

The PDSA cycle was used to develop and evaluate the effectiveness of the geriatric trauma consult protocol. The planning step included developing the trauma consult protocol and disseminating the new protocol to the hospitalist and trauma teams. The do step occurred over 14 weeks spanning four months, with the hospitalists initiating the new protocol. Data was collected using the trauma registry reports and electronic medical records. Data was collected weekly to measure the number of patients meeting inclusion criteria, the number of consults placed and completed, unplanned ICU admissions, and mortality. The data was plotted on a run chart for each two-week PDSA cycle. The study step occurred every two weeks with a review of the data tracking the number of consults placed and completed, unplanned ICU admissions, and mortality using the daily trauma reports sent by the trauma registrar, hospital electronic medical record and the trauma registry reports. The results of the study step determined the act step. Results were shared with the quality improvement team for the project. Revisions to the process made during the act phase were in collaboration with the quality improvement team. The geriatric trauma consult protocol was implemented September 9, 2020 and data was collected over 14 weeks ending December 16, 2020.

Ethical Consideration & Protection of Human Subjects

Ethical considerations for the quality improvement project included the concern of patients that would benefit from a trauma consult but are excluded from the age parameter of 70 years or older. The literature supports a protocol that sets the minimum age at 70 years and older for the target population. Other ethical concerns included possible breach of confidentiality or invasion of privacy. This was minimized by utilizing a separate code sheet to keep medical record numbers separate from the data collection tool to protect patient identity. A code sheet with medical record numbers was needed to track each patient included in the quality improvement project and assign a number used on the data collection tool for deidentification of data. The code sheet was stored separately from the data collection tool. The data collection tool with no identifying information was maintained on a password protected computer. The intervention of the geriatric trauma consult protocol was equal and equitious to everyone in the target population. The potential for increased financial burden to the patient from a trauma consult did exist. The majority of individuals aged 70 and older have Medicare coverage during their hospitalization and should experience minimal financial impact with the new protocol. Individuals in the target population should not have had the potential to be taken advantage of during the project implementation. The target population was inclusive of everyone 70 years of age or older with a single site injury admitted as a level IV trauma patient to the hospital by the hospitalists September 9, 2020 through December 16, 2020.

Preparation for the hospital's formal approval process included completion of the Biomedical Research Collaborative Institutional Training Initiative (CITI) Basic/Refresher Course. The Biomedical Research CITI modules were completed June 3, 2020, and valid for three years. The hospital institutional review board (IRB) required a prescreening application

process to be submitted through the research director and the IRB coordinator prior to official IRB application submission. The prescreening process is a QI versus research checklist to determine if the project falls under the umbrella of QI or research. If the project meets only QI criteria, a formal IRB review is not required. The quality improvement project was deemed QI by the organization's IRB, and no further IRB review was needed. The university's Qualtrics Quality Self-Assessment Tool was completed and approved by the faculty for submission to the educational institution IRB. The educational institution approved the quality improvement project as QI and no further IRB review was required.

Section III. Project Design

Project Site and Population

The quality improvement (QI) project was implemented at the main hospital of a regional healthcare system in Southeastern North Carolina. The hospital is the primary acute care center for three counties but admits patients from the surrounding nine counties (NHRMC, 2016). The organization's community health needs assessment in 2016 reported the three-county population as 400,734, with the hospital's county being 81.5% Caucasian and 14.3% African American (NHRMC, 2016). The population for the QI project included individuals age 70 and over with a single site injury who were admitted to the hospital on the hospitalist service and did not meet trauma activation or trauma consult criteria. A single site injury is an injury to only one body part, usually from a fall, such as a hip or a shoulder fracture that requires admission to the hospital. Difficulty to correctly identify patients meeting project inclusion criteria or a hospitalist who has not fully bought into the project were identified as possible barriers to the project's success. The impact of the quality improvement project was dependent on the hospitalists ordering the trauma consults.

Description of the Setting

The hospital is a Level II trauma center with a multidisciplinary trauma team comprised of surgeons, surgery and medicine residents, advanced practice providers, pharmacists, and physical therapists. The hospital has approximately 600 inpatient beds. The hospitalists initiation of trauma consults at the time of admission took place in the emergency department (ED) for individuals who initially presented by emergency medical services (EMS) or by private vehicle. Patients were also admitted to the hospital as direct admits from a provider's office or as a transfer from an outside hospital or ED. A routine trauma consult was ordered by the hospitalists into the electronic medical record at the same time admission orders were written. A

secure message was sent via Perfect Serve to the trauma team service by the hospitalist to alert them of a new consult per hospital protocol.

Description of the Population

The QI project included patients 70 years and older who presented to the hospital with a single site injury and were admitted to the hospital by the hospitalist service under inpatient status. A single site injury in the elderly is usually caused by a ground-level fall. Inclusion criteria were patients with a traumatic single site injury and listed on the medical center trauma registry. Patients that met trauma level I-III activation criteria on initial presentation to the hospital received an assessment from the trauma team and were excluded from the QI project. A single site injury not meeting trauma level I-III activation criteria may include an isolated hip fracture, pelvic fracture, or shoulder fracture.

The QI project was implemented by the hospitalist group and the hospital trauma team. The hospitalists have 36 physicians and four advanced practice practitioners (APPs) and provide coverage twenty-four hours a day, seven days per week. The hospitalists have five admitting physicians and two admitting APPs scheduled each day. These providers are responsible for most patients admitted to the hospitalist service during the 24 hours. The providers rotate every seven days. The trauma service consists of three critical care surgeons, two trauma orthopedic surgeons, two general surgeons, and seven APPs. The trauma service also includes eight surgical residence that rotate three at a time for one month. A trauma attending must respond to a trauma level I activation, and a senior surgical resident must respond to a Trauma II activation. Level III trauma consults are seen by the APPs in collaboration with the residents and attendings. The consults on the level IV trauma patients for the quality improvement project were completed by the APPs.

Project Team

The project team consisted of the medical director of trauma services, the director of trauma services who was the site champion for the DNP student, the quality director for the hospitalists, and the DNP student who served as the project lead. The trauma services medical director and quality director for the hospitalists served as liaisons for their respective groups, by assisting with staff buy in of the project, and provided feedback during PDSA review process. The trauma services director served as the site champion and provided expert knowledge on the organizational need for the project and current workflow. The trauma services director was responsible for resource management of the trauma services, including personnel staffing. The project lead was responsible for creating the project tip sheet for the hospitalists, educating the hospitalists and trauma services, collecting, and tracking the data, leading the PDSA cycle reviews, and following up on any PDSA cycle changes. See Appendix B for the geriatric protocol. The hospitalists were responsible for implementing the project by initiating the trauma consult. The trauma team completed a tertiary assessment on the patient after a consult was received. The project team conducted PDSA cycles throughout the 14-week implementation.

Project Goals and Outcome Measures

The purpose of the QI project was to lower unplanned ICU admissions and mortality in patients 70 years and older with a single site injury listed on the trauma registry who did not have a trauma activation or trauma consult. A pilot project was implemented using the main hospitalist group in the hospital and the trauma services. Outcome measures tracked were the number of unplanned ICU admissions and the hospital mortality rate in the geriatric trauma population.

Description of the Methods and Measurement

The project was developed and implemented using the Institute of Health (IHI) Model for Improvement framework. The PDSA cycle was completed on a two-week continuous cycle. Measures assessed were if the hospitalists ordered the consults and if the consults were being completed by the trauma team within 24 hours of the consult being placed. The prior 12 months of unplanned ICU admissions and mortality in this cohort were collected from the hospital trauma registry. Unplanned ICU admissions are defined as an admission to the ICU once the patient is stabilized and sent to the floor. Mortality for the project was defined as a death during hospitalization that occurs after stabilization and transfer to a hospital bed. The data was collected using a data collection tool created in Microsoft Excel (See appendix C). Data was tracked using a run chart for each two-week PDSA cycle.

Discussion of the Data Collection Process

Individuals meeting the QI population criteria identified from the daily trauma registry report were included in the project. A daily trauma registry email was sent identifying every patient that met trauma registry criteria from the previous 24 hours. From the email, level IV trauma patients aged 70 and older with a traumatic single site injury who were admitted to the hospital by the hospitalist group were identified. A code sheet was used to record patients' medical record numbers and assigned coded number that was stored separately from the excel spreadsheet. An excel spreadsheet was used to collect data for data analysis. Data collected was held on a password-protected computer only accessible by the project lead (See Appendix C). The patients' electronic medical records (EMR) were reviewed weekly to determine if a consult was placed by the hospitalist on admission to the hospital and if the consult was completed within 24 hours. An EMR review was completed on a weekly basis to assess for unplanned ICU admissions and in hospital mortality. Data collected included: date of admission, age, injury,

mechanism of injury, seen by trauma services before admission, consult ordered by the hospitalist and what date was it ordered, consult completed by trauma and what date was it completed, unplanned admissions to the ICU, dates, and reason for the unplanned admission, death during hospitalization, date, and cause of death. After PDSA reviews, urinary tract infection (UTI), reminder sent to attending, consult ordered by the attending and date consult completed were added to the data collection tool. The data collected was compared with the trauma registry once it was closed for the month.

Implementation Plan

Initial implementation of the QI project included education to the trauma team and hospitalist group on the background for the project, current state, patient criteria and protocol workflow. Education was completed during August and September utilizing the virtual Zoom platform. The Zoom platform allowed for questions and concerns to be expressed and asked by all attendees. Once education was completed, the project was implemented for 14-weeks over four months with seven biweekly PDSA cycles.

Timeline

Collaboration of the project team and finalization of the project details were completed by June 30, 2020. The Institutional Review Board (IRB) paperwork was submitted to the project site IRB by July 15, 2020 for review and approval. Following approval from the project site, the university paperwork was submitted for a determination by July 31, 2020. Education of the hospitalists was completed during the months of August and September with a follow up email sent within 48 hours. The QI project was reviewed with the trauma team on September 7, 2020. The project start date was September 9, 2020. Data was collected and PDSA cycles completed biweekly until December 16, 2020. Data was analyzed in January of 2021. Data analysis, QI

poster and presentation creation was completed in February and March of 2021. A virtual project poster presentation was given to the university College of Nursing on April 6, 2021. A virtual project presentation will be given to disseminate the QI data to the hospitalists and the trauma team in May and June of 2021.

Section IV. Results and Findings

Results

Thirty-two patients were identified from the trauma registrars' daily reports that met the inclusion criteria for the geriatric trauma quality improvement project. Ten (31.3%) out of the 32 patients had a trauma consult order placed by the hospitalist. Half (50%) of the ten consult orders were written at the time of admission, and the other five (50%) were ordered by the receiving hospitalist the following morning. After the first PDSA cycle, an updated protocol was created to show a workaround for the consult paging system to be able to reach the trauma team APPs. During the third PDSA cycle, a decision was made to send a reminder message using the same messaging system to communicate a need for a trauma consult order to the oncoming hospitalist the next day if a consult had not been ordered at the time of admission. A daily trauma registry report was used to identify the patients that met project inclusion criteria from the previous 24 hours. This increased the number of consults placed. Reminders were not sent for patients admitted on Friday or Saturday due to no trauma reports generated on weekends. Reminders increased the number of consults placed. Having a trauma consult placed by the medicine provider elevated the trauma level for those ten patients from a level IV to a level III. The trauma team completed the tertiary assessments on all ten patients the same day that the consults were ordered. See Appendix D for biweekly PDSA cycle run chart.

Outcomes Data

No occult injuries were identified as a result of the tertiary assessments completed by the trauma team. From the 32 eligible patients, there was only one (3.1%) unplanned ICU admission and no in hospital deaths. The one patient with an unplanned ICU admission did not have a trauma consult ordered during their hospitalization. Midway through the project, urinary tract

infections (UTIs) were identified during the third PDSA cycle as the only reoccurring complication. From the review, UTIs were added as an outcome measure. There were four (18.2%) identified cases of UTI in the 22 patients not seen in consult by the trauma team. Of the ten patients seen by the trauma team, no cases of UTI were identified.

Discussion of Major Findings

During the project implementation, few changes were made in the QI process due to the low volume of trauma consults. The large number of hospitalists and their 24 hour coverage made it difficult to implement the QI project on such a small patient population. Sending reminders to the attending physicians the following day of the patient's eligibility in the protocol increased participation by two-fold. Ten (31.3%) of eligible patients had a trauma consult order placed by the hospitalists. This was much lower than anticipated. The trauma team completed 100% of the tertiary assessments that were ordered as a consult initiated by the hospitalists. No occult injuries were identified in the patients 70 and older that met the criteria for the consult. There were no unplanned ICU admissions in the trauma consult group compared to one in the non-consult group. The initiation of a trauma consult for a tertiary assessment elevated the patient's trauma level from a IV to a III. The elevated trauma level provides access to specialized care delivered by the trauma team service.

Section V. Interpretation and Implications

Cost Benefit Analysis

The quality improvement (QI) project was piloted on a small scale to determine if or any impact could be made on patient outcomes prior to implementing a similar project organization-wide. The cost to the organization to implement the project primarily involved employee time. The director of trauma services and trauma APPs are salaried positions and did not increase salary costs for the organization, however, did increase their workload. The time to complete initial record review, Perfect Serve reminders and follow-up record review with documentation was estimated around 20 to 30 minutes per day. There were no costs associated with a hospitalist ordering a consult.

The tertiary assessments were completed by the trauma advanced practice providers (APPs) with an average cost with benefits of $72.05 per hour to the organization. The tertiary assessments take approximately an hour to complete and document. Each tertiary trauma consult can be billed to Medicare as a 99223. A 99223 converts to 3.86 RVUs at an average rate of $55 per RVU. The potential organizational revenue would be $180.45 ($212.30 x 0.85 APP allowable of Medicare rate) per tertiary assessment consult completed by an APP.

The benefit to the geriatric population by continuing the project is increased interdisciplinary collaboration between medicine and trauma services providing a more comprehensive treatment plan and continuity of care. Integrating the project protocol into policy would help fulfill the American College of Surgeons Committee on Trauma (ACS-COT) recommendations for implementing a geriatric trauma protocol. Meeting the recommendations of the ACS-COT is necessary to maintain trauma verification. The geriatric trauma consult project helped address the special needs of a vulnerable growing population and aligned with the Triple Aim and Healthy People 2020.

Resource Management

Several resources the organization already has in place helped with the implementation of the QI project. Both the trauma service APPs and the hospitalist service provide twenty-four-hour coverage making it possible for consults to be ordered and completed without delay. The hospital's paging system, Perfect Serve, allowed the hospitalists to request consults and communicate over text message with trauma services. The Perfect Serve system was also utilized to send reminder messages the following morning to the hospitalists to order trauma consults if not already requested. The trauma service has trauma registrars that complete a daily weekday report of each trauma patient that receives care either through the emergency room or by direct admission into a hospital room. The hospital has a secure email allowing for the report to be emailed. The trauma service has a tertiary assessment template uploaded into the electronic medical records system making it a standard process.

The project would have benefited from additional resources. Utilizing the emergency room triage nurse to identify patients on arrival would help with early identification of patients. Earlier identification would lead to more timely admission by the hospitalist and subsequent assessment by the trauma team. The surgical residents rotate through the trauma service but were not given responsibility in completing the tertiary assessments limiting the scale of the project. Having increased personnel to complete tertiary reviews would have allowed the project to be piloted with an additional hospitalist group. The setup of the Perfect Serve system made it difficult for the hospitalists to send a request for a consult directly to the APPs. A different algorithm within Perfect Serve could be programmed, making it easier to place a consult. This may have increased the number of consults ordered.

Implications of the Findings

The findings from the project helped to demonstrate that a collaboration between the departments of nursing, medicine and trauma services can be achieved. The initiation of a trauma consult by the admitting medicine physician on a level IV geriatric patient elevates the trauma to a level III. This elevation in trauma level gives the patient access to a tertiary assessment by a trauma team member. The tertiary assessment is used to identify any occult injuries and to provide access to more immediate care. The findings demonstrated by utilizing the daily trauma registrars' reports, patients could be quickly identified, and the covering physician notified of the patient's possible benefit from a tertiary assessment.

Implications for Patients

The project helps to address the need in the increasing elderly population who may present differently after a traumatic event to the hospital. The project provided a process to identify geriatric patients who may have an occult injury but are not initially elevated above a level IV trauma due to their slowed physiological response. The trauma consult assessment and subsequent elevation to a level III trauma may help the patient receive needed care in a timelier manner. Early identification of occult injuries or complications such as UTIs can decrease unplanned ICU admissions and in-hospital trauma deaths. This project provided increased access to care by initiating consults at the time of admission which improves patient experience, the aging population's health, and decreases costs by identifying injuries or illness prior to costly complications.

Implications for nursing practice

The project raises nursing awareness of the vulnerability of the aging population and how this population may present differently after a trauma. The project impacts nursing practice by

recommending an elevated trauma response on level IV trauma patients based on age, not only on physiologic parameters. Having a protocol allows for a more standard nursing workflow. Integrating the protocol into policy will incorporate nurses in a collaborative role of assessing and communicating with the multidisciplinary care team. Initiating policy change to promote better patient outcomes is a responsibility of nursing leadership. Nurses can lead practice change through synthesizing literature, evaluating best practices, and developing new policies to improve patient care outcomes. Through the development and implementation of the QI project, the project leader met all eight of the Association of American Colleges of Nursing (AACN) DNP Essentials (See Appendix E).

Impact for Healthcare System(s)

The project supported the local healthcare system in addressing population health in the community by providing increased access to specialized medical care. The healthcare system already has the services to provide the needed care. This project provided a protocol that can be implemented system-wide to help facilitate medical care reaching the geriatric trauma patient. The geriatric trauma protocol supports the organization in meeting the recommendations of the American College of Surgeons Trauma Quality Improvement Program. Meeting these recommendations gives the organization trauma center verification. Trauma Center verification by the American College of Surgeons is a voluntary evaluation to verify resources available for the optimization in the treatment of the trauma patient. The healthcare system serves as the trauma center for much of the southeastern region of North Carolina. The trauma center improves population health by providing rapid access to emergent medical care. Providing rapid access to care would decrease costs related to complications from delayed care or undiscovered occult injuries. Increasing access to care and lowering healthcare costs aligns with the Triple

Aim. Healthcare systems can lead initiatives to decrease unintentional falls mortality rates through evidence-based falls prevention programs and new trauma care policies in the post trauma setting.

Sustainability

The project would be able to be sustained by the organization as a collaboration between the department of trauma services and the hospitalist group in the care of geriatric trauma patients. The current project did not increase out-of-pocket costs to the organization. To move forward with implementing the protocol organization-wide to include all level IV trauma patients age 70 or over, the organization would need to expand the size of its current trauma service team. The department of trauma services does not plan to continue this project or adopt as a permanent protocol due to the current workload and limited resources. Findings from the pilot project did not provide enough evidence to support the continuation of the protocol. However, the department of trauma services will continue its efforts to investigate and implement a geriatric trauma protocol.

Dissemination Plan

The DNP project dissemination plan includes the participants in the project, the university and the College of Nursing, and a trauma-specific symposium. A poster presentation was provided virtually to the college of nursing faculty on April 6, 2021. This presentation will include a virtual project poster with a 9 to10 minute verbal overview followed by a brief question and answer period. The overview will consist of background information, current literature, methodology, significance of findings, recommendations and implications for practice. The QI project will be detailed in a scholarly paper that will be uploaded to university ScholarShip

electronic repository April 27, 2021. This repository is available to the general public and can be accessed through the university library website or an online search engine.

Dissemination to the project participant groups will take place in May and June of 2021. The Department of Trauma Service, consisting of the medical director, the director of trauma services, the trauma surgeons, and the trauma advanced practice providers, will be given a virtual report out at their monthly staff meeting on May 27, 2021. The hospitalist group will be given virtual report out during their monthly staff meeting over Zoom on the first Wednesday in June 2021. The project poster will be displayed on the virtual platform during the presentations. These presentations will allow for audience participation and time allotted for questions and answers.

Abstract submission will be submitted to the annual SEAHEC Trauma Symposium, usually held every year in February. Submission to the symposium will be for participation in the poster exhibit. Approved posters are to be shared during the afternoon pre-conference workshops the day prior to the main conference. The trauma symposium is targeted to anyone who participates in the care of the trauma patient and includes physicians, nurses, EMS providers, and administrators.

Section VI. Conclusion

Limitations

Several limitations were identified during project implementation. The Perfect Serve system used to communicate a new consult to the trauma service did not allow the consults to be given directly to the advanced practice providers (APPs). The Perfect Serve notifications had to be routed through the on-call surgical resident. The surgical residents rotate on a weekly basis making it difficult to keep the residents educated and up to date on the project. The large number of hospitalists covering three different shifts in a 24 hour period made it hard to follow through on education and reminders. The large number of hospitalists compared to the small number of eligible patients meant most hospitalists had zero to one eligible patient during the entire 14-week project. The low number of eligible patients limited the results. The project was extended two extra weeks for a total of 14 weeks which yielded only three extra eligible patients. Another limitation was the Covid-19 pandemic. Most hospitalists opted not to stay in the emergency room to complete their documentation, as was the normal practice prior to the pandemic. Decreased accessibility of the physicians made it difficult to follow up with continued education and reminders. The lack of standardization in physician documentation made it hard to gather information needed to identify eligible patients. The electronic medical record (EMR) system itself was difficult to navigate and find physician orders after patient discharge, making it hard to follow consults and complications.

Recommendations for Others

A recommendation for future projects would be to revisit eligibility criteria for simplification and ease of use. The eligibility criteria for this project included the term single site injury. This may have led to confusion and decreased consult numbers. In retrospect, it

would have been a better representation of the population to only include hip fractures. This would have made it more definitive and easier to capture. To make the project larger, additional patients could have been eligible by adding additional hospitalist groups or including the orthopedic service. The age criteria could also be lowered to 65 to expand the population. Establishing a more strightforward process to communicate new consults directly to the APPs may help with hospitalist participation.

Recommendations Further Study

Further study of geriatric level IV trauma patients will be needed to substantiate the need for additional resources. As the aging population continues to grow, the injuries and complications from ground-level falls will increase and have an impact on community resources and healthcare spending. A project evaluating the automatic elevation of a level IV geriatric trauma patient to a level III upon presentation to the emergency room would help to capture more patients in need of a higher level of care. A project to assess the interprofessional collaboration efforts between the departments of trauma, medicine, and nursing to evaluate the impact on patient experience or hospital length of stay in this population may be more beneficial to the patient and the organization.

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Appendix A

Literature Matrix

Authors	Year Pub	Article Title	Theory	Journal	Purpose and take home message	Design/Analysis/Level of Evidence	IV DV or Themes concepts and categories	Instr. Used	Sample Size	Sample method	Subject Charac.	Comments/critique of the article/methods GAPS
Fernandez et al	2019	Success of an expedited emergency department triage evaluation system for geriatric trauma patients not meeting trauma activation criteria		*Emergency Medicine*	decrease time to access care for geriatric patients not meeting trauma activation	retrospective review prior based on ISS and post protocol based new protocol	Expedited evaluation	Injury Severity Score ISS	3,835	Trauma registry of individuals 65 and older based on ISS	age 65 and older	This is in hospital triage. 10 year span and can't account for changes/improvements to effect better outcomes.
Ringen et al.	2019	Improvement in geriatric trauma outcomes in an evolving trauma system		*Trauma Surg Acute Care*	Assess impact of multidisciplinary trauma team	retrospective study, Level IV	Inpatient trauma multidisciplinary team	Injury Severity Score ISS	2,628	Method of Injury, admission to the hospital	61-70, 71-80, 81 and older	This was inpatient study, not related to triage
Cull et al.	2019	Development of trauma prediction models using emergency medical service vital signs to reduce over- and under triage rates in penetrating wounds and falls of the elderly		*The American Surgeon*	determination of trauma activation based on developed activation prediction model to benefit under triage and over triage	regression model	used triage models to obtain under triage rates and comorbidity analysis	Developed trauma activation prediction model, data from 2014 national trauma bank, ISS		2013-2015 National Trauma Bank, ISS, injury type, MOI	14-64, 65 and older	
Bardes et al.	2019	Old age with a traumatic mechanism of injury should be a trauma team activation criterion		*Journal emergency medicine*	determine whether age as a TTA criteria identifies patients in need of additional recourses	retrospective trauma registry study of trauma team activation	Used SSI, procedures, disposition	SSI	739	2012-2016 trauma registry	>70	implementation based on >70 regardless of vitals, The combined overall over triage rate was 30%. The overtriage rate for the age only group was 39.6%
Mason et al.	2017	Anticoagulated trauma patients a level 1 trauma centers response to a growing geriatric population		*Journal emergency medicine*		retrospective trauma registry		Lab results and CT scan			Age 55 and older	
Hammer et al.	2016	improving geriatric trauma outcomes a small step toward a big problem		*journal of trauma acute care surgery*	A retrospective study to assess the effectiveness of a protocol mandating all injured patients 70 and older to have the highest trauma level activation regardless of physiology or MOI.	Fisher's exact test	**Level 1 trauma center**	Age	2,269		70 years and older	based on age alone higher level decreased ED LOS and mortality
Caterino et al.	2016	Effects of geriatric-specific trauma triage criteria on outcomes in injured older adults: A statewide retrospective cohort study.		*Journal American Geriatric*	Mortality rate and dis	retrospective study, Level IV			34,499	All hospitals in Ohio	70 years and older	The change resulted in an increase of 14% in meeting criteria for trauma but only saw a 1% increase in transport to a trauma center. Mortality rate in the moderate to severely injured did not decrease, but the mildly injured ISS less than 10 did see a mild decrease in mortality from 3% to 2.5%.
Brown et al.	2015	Systolic blood pressure criteria in the National Trauma Triage Protocol for geriatric trauma: 110 is the new 90		*Journal Trauma Acute Care Surgery*	Compared blood pressures in the two age cohorts to evaluate substituting blood pressure of 110 for 90 on triage performance and mortality	retrospective review	**Blood Pressure**	ISS greater then 15	1,555,944	2 year period	65 years and older and age 16-64	resulted in undertriage reduction of 4.4% and overtriage increase of 4.3%
Carr et al.	2018	Increased trauma activation is not equally beneficial for all elderly trauma patients		*Journal of Trauma and Acute Care Surgery*	Assess at what age is increase in activation level beneficial	retrospective review	**Age**	ISS, LOS,	4,341		70 years and older	Mortality was significantly reduced in the Post group starting at age 77 years or older. Hospital LOS was reduced at age 78 and older. The authors suggest that changing the activation criteria to an older age may help offload the burden to the system.

Appendix B

Geriatric Trauma Protocol

The quality improvement project aims to evaluate if a tertiary assessment by trauma services on geriatric patients age ≥70 years with a single site injury will decrease unplanned ICU admissions and mortality. A tertiary assessment may help identify injuries not seen on primary and secondary assessment during initial triage.

Patients that sustain a traumatic single site injury are included and tracked on the trauma registry. This quality improvement project is being implemented in the geriatric level IV trauma population to meet recommendations by the American College of Surgeons Trauma Quality Improvement Program and improve patient outcomes.

Single site traumatic injuries most often occur from a fall in this population. Examples of a single site injury include:

- Isolated hip fracture
- Pelvic fracture
- Rib fracture
- Shoulder fracture

Actions:

1. New Hanover Hospitalist service has accepted a patient for admission who is age ≥ 70 with a new single site traumatic injury

2. Hospitalist will place a trauma service consult at time of admission

3. Hospitalist will Perfect Serve the consult to the Trauma Surgery junior resident. To reach the junior resident, check NO when asked if this is a new consult and the option to PC the resident will become available. The hospitalist will text “Consult for tertiary assessment by the APP.”

4. Trauma Services Advanced Practice Providers will complete the consult within 24 hours of receipt

5. Trauma services will continue to follow if warranted or will sign off if no trauma service assistance needed

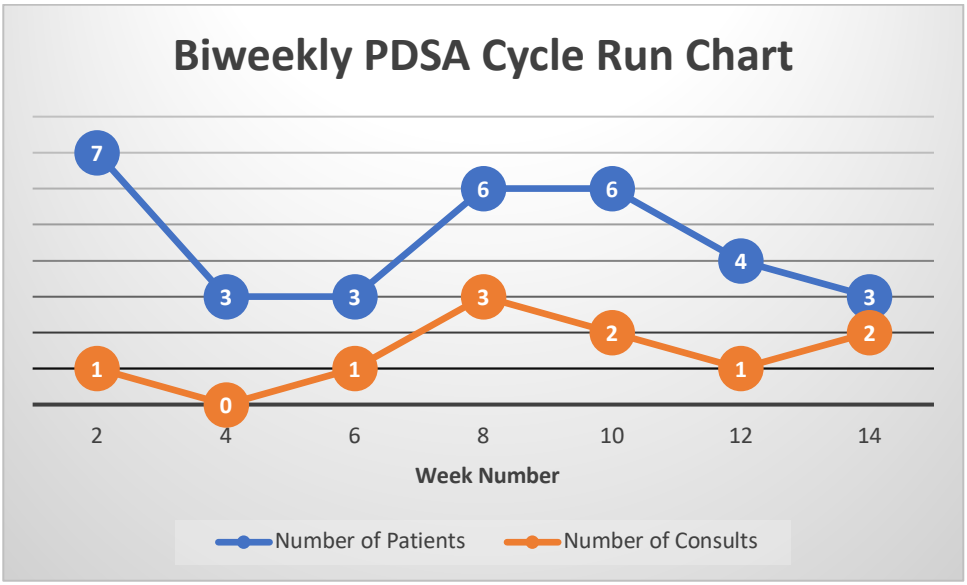
Appendix C

Data Collection Tool

Assigned #	Date of Adm	Age	Sex	Injury	MOI	Pt seen by trauma before admission	Did the hospitalist order a trauma service consult at time of admission	Consult ordered after admission by hospitalist	Perfect Serve reminder to provider (yes/no)	Date consult ordered	Consult completed by trauma	Date consult completed	UTI during hospitalization	Unplanned ICU Admission	Dates of unplanned ICU admission	Reason for unplanned ICU admission	Death during hospitalization

Appendix D

PDSA Run Chart



Appendix D

AACN Doctor of Nursing Practice Essentials

	Description	Demonstration of Knowledge
Essential I ***Scientific Underpinning for Practice***	**Competency** – Analyzes and uses information to develop practice **Competency** -Integrates knowledge from humanities and science into context of nursing **Competency** -Translates research to improve practice **Competency** -Integrates research, theory, and practice to develop new approaches toward improved practice and outcomes	• Completed practice problem research • Completed literature review • Analyzed research for project development utilizing Melnyk's Level of Evidence • Developed QI project based on best current knowledge from research review
Essential II ***Organizational & Systems Leadership for Quality Improvement & Systems Thinking***	**Competency** –Develops and evaluates practice based on science and integrates policy and humanities **Competency** –Assumes and ensures accountability for quality care and patient safety **Competency** -Demonstrates critical and reflective thinking **Competency** -Advocates for improved quality, access, and cost of health care; monitors costs and budgets **Competency** -Develops and implements innovations incorporating principles of change **Competency** - Effectively communicates practice knowledge in writing and orally to improve quality **Competency** - Develops and evaluates strategies to manage ethical dilemmas in patient care and within health care delivery systems	• Evaluated project using PDSA cycles • Developed data collection tool • Developed project timeline • Developed educational tool • Modified project based on PDSA review • Follow up education provided on project changes
Essential III ***Clinical Scholarship & Analytical Methods for Evidence-Based Practice***	**Competency** - Critically analyzes literature to determine best practices **Competency** - Implements evaluation processes to measure process and patient outcomes **Competency** - Designs and implements quality improvement strategies to promote safety, efficiency, and equitable quality care for patients **Competency** - Applies knowledge to develop practice guidelines **Competency** - Uses informatics to identify, analyze, and predict best practice and patient outcomes **Competency** - Collaborate in research and disseminate findings	• Used current best practice through literature review and expert interviews to develop QI project • Completed PDSA cycles to review project process and make improvements • Collaborated with the site champion and departments of trauma and medicine to implement a QI project • Implemented a QI project on the geriatric population to improve access to care
Essential IV ***Information Systems – Technology & Patient Care Technology for the Improvement &***	**Competency** – Design/select and utilize software to analyze practice and consumer information systems that can improve the delivery & quality of care **Competency** - Analyze and operationalize patient care technologies **Competency** – Evaluate technology regarding ethics, efficiency and accuracy **Competency** – Evaluates systems of care using health information technologies	• Utilized Excel software to collect data and evaluate trends • Utilized electronic medical records to implement and evaluate a QI project

Transformation of Health Care		• Utilized medical search databases to obtain current best practice for a QI project • Utilized health information technology to facilitate communication and reminders to medical providers
	Description	**Demonstration of Knowledge**
Essential V ***Health Care Policy of Advocacy in Health Care***	**Competency**- Analyzes health policy from the perspective of patients, nursing and other stakeholders **Competency** – Provides leadership in developing and implementing health policy **Competency** –Influences policymakers, formally and informally, in local and global settings **Competency** – Educates stakeholders regarding policy **Competency** – Advocates for nursing within the policy arena **Competency**- Participates in policy agendas that assist with finance, regulation and health care delivery **Competency** – Advocates for equitable and ethical health care	• Project lead for the implementation of a multi-department QI project • Presented potential QI projects to stakeholders to obtain support from the organization • Attended department QI meetings to gather information on department needs • Advocated for the involvement of the hospitalist team to help improve quality of care • Provided education to all stakeholders in the QI project
Essential VI ***Interprofessional Collaboration for Improving Patient & Population Health Outcomes***	**Competency**- Uses effective collaboration and communication to develop and implement practice, policy, standards of care, and scholarship **Competency** – Provide leadership to interprofessional care teams **Competency** – Consult intraprofessionally and interprofessionally to develop systems of care in complex settings	• Implemented a collaborative QI project between trauma services and the hospitalist group to improve patient outcomes • Served as project lead on multidepartment QI project • Consulted with the medical director and the director of trauma and nursing faculty to develop a QI project
Essential VII ***Clinical Prevention & Population Health for Improving the Nation's Health***	**Competency**- Integrates epidemiology, biostatistics, and data to facilitate individual and population health care delivery **Competency** – Synthesizes information & cultural competency to develop & use health promotion/disease prevention strategies to address gaps in care **Competency** – Evaluates and implements change strategies of models of health care delivery to improve quality and address diversity	• Integrated latest research to develop a QI project with the trauma services department to improve population health and decrease healthcare costs to align with the Triple Aim. • Implemented a QI project addressing a gap in care of the geriatric population • Evaluated current trauma protocols and implemented a new trauma protocol for the geriatric population

Essential VIII ***Advanced Nursing Practice***	**Competency**- Melds diversity & cultural sensitivity to conduct systematic assessment of health parameters in varied settings **Competency** – Design, implement & evaluate nursing interventions to promote quality **Competency** – Develop & maintain patient relationships **Competency** –Demonstrate advanced clinical judgment and systematic thoughts to improve patient outcomes **Competency** – Mentor and support fellow nurses **Competency**- Provide support for individuals and systems experiencing change and transitions **Competency** –Use systems analysis to evaluate practice efficiency, care delivery, fiscal responsibility, ethical responsibility, and quality outcomes measures	• Led the Development, implemented and conducted PDSA reviews on a QI project for the geriatric population • Made recommendations and improvements to the QI project with each PDSA cycle • Wrote a detailed paper outlining the rationale, development, implementation, and evaluation of a 14 week collaborative QI project to improve access to care and outcomes in the geriatric population • Used excel software to analyze and evaluate outcomes of a QI project.