Increasing Sepsis Compliance in the Neuroscience Intensive Care Unit

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Abstract

Sepsis is the leading cause of healthcare spending and the cause of death in hospitals globally. A review of the EMR medical records through a blinded redacted view over four months (September-December 2019) revealed sepsis was one of the top 10 diagnoses) in the hospital A chart audit also revealed that nurses were not consistently completing the sepsis screen in the medical record and compliance with IHI's 3-6 hour bundles was inconsistent. Nurses (n=75) received 1:1 educational intervention on the St. John's guidelines for sepsis reporting adopted by the institution during the four-month QI project intervention. Through 1:1 nurse education over four months with a nursing staff of all benefitted positions on the NSICU, the compliance rate increased from 86% in September at the beginning of the project to 90% in December at the end of the project. Having ICU nurses at the point of care with a smaller nurse to patient ratios to implement the sepsis bundles is likely to result in less variability in the screening process and missed early diagnosis and treatment opportunities.

Keywords: *Sepsis*, EMR, St. Johns' guidelines, IHI 3-6-hour bundles, ICU nurses, continuing education, surviving sepsis campaign guidelines

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Chapter I

Sepsis can be the result of a bacterial or viral infection, such as pneumonia, urinary tract infection, the flu, or Coronavirus Infection Disease (COVID-19); you probably know someone who has been affected by sepsis and may have died as a result of complications (www.sepsis.org, 2020). The CDC describes sepsis as a clinical syndrome caused by "a dysregulated host response to infection," based on clinical judgment (www.medicalmutual.com, 2019).

> Sepsis described as a heterogeneous disease process at the cellular level that causes deranged oxygen metabolism with distributive shock being secondary to microcirculatory heterogeneity, which leads to a delivery and consumption mismatch at the cellular level, secondary to ischemic and cytopathic hypoxia, which causes cell death and eventually sepsis and organ failure (Numan et al., 2018, p. 1).

One of sepsis's essential features is multiple organ dysfunction, with the liver commonly involved in multiple organ dysfunction syndromes. Coagulation dysfunction of the liver and metabolic disorders of elevated ammonia levels in the bloodstream can lead to abnormal blood coagulation, leading to a complicated sepsis diagnosis (Zhao et al., 2020).

Sepsis is a significant health problem worldwide with costs to society that extend far beyond the lives lost. Because people live longer with more chronic diseases, The impact of survivorship has increased even though life expectancy grew (Tiru et al., 2015). Castelluci (2017) notes that the current sepsis rate has remained flat for nearly five years; the mortality rates appear to increase during the same period. Patients are continuing to die and after discharge to palliative care because of the sepsis diagnosis. Medicare paid over six billion dollars in sepsis treatment in 2015, making it the most costly and common ICD-10 discharge diagnosis (Buchman

et al., 2020). Sepsis was and still is a significant global issue. This topic was such an important issue that the surviving sepsis campaign launched its annual meeting in the fall of 2002 in Barcelona, Spain, to address this global topic (www.survivingsepsis.org, n.d.).

The surviving sepsis campaign achieved many milestones, including establishing standards of care, improving the diagnosis and treatment guidelines, and increasing sepsis awareness worldwide. Sepsis treatment is still expensive and needs more attention and ongoing education on ways to reduce mortality rates. Sepsis has been reportedly responsible for up to 140% higher mortality rates than all other death causes (Hajj et al., 2018). Sepsis continues to affect more than a million people a year, with greater than 30% of those affected dying from septic shock. It is one of the most significant risk factors identified through Diagnostic Related Groups (DRGs) that have led to in-hospital death, discharge to hospice facilities, and readmissions within 30-days to hospitals post-discharge (Mayr et al., 2017). If a patient survives a sepsis condition, 50% of those patients will develop the post-sepsis syndrome, which can have lasting health results. Post sepsis syndrome is more significant in patients admitted to the intensive care unit. This syndrome can cause physical and psychological long-term effects such as depression, insomnia, sleep disorders, panic attacks, hallucinations, nightmares, and decreased cognitive functioning (Sepsis Alliance, 2020b).

A case study of a patient in the NeuroScience Intensive Care Unit (NSICU) who died because of nursing missed reporting opportunities to the medical staff and the medical team's lack of intervention throughout the patient's hospitalization was the inspiration for this project (see Appendix A). This patient had multiple sepsis alerts triggered by tachycardia, tachypnea, increasing trends of his white blood cells (WBCs) level, no ammonia levels drawn, and ignoring automatic lactate lab not drawn. Most importantly, nurses did not report alerts promptly to the

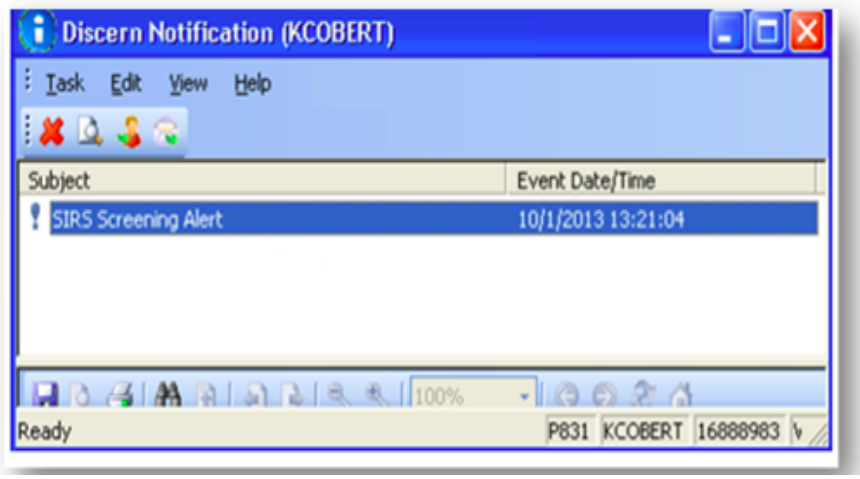
medical staff, which caused nonintervention. The quality improvement (QI) project revealed the nursing staff were alarm-fatigued, dismissed some of the alarms, or turned off some of the parameters. The physicians also had the sepsis alarms reported several times in a shift and failed to respond because of the patient's known underlying condition and did not intervene at the time of the report and during collaborative rounding at the bedside. Intensive Care Unit (ICU) nurses play a significant role in increasing quality improvement in sepsis care through significant early interventions, leading to improved patient survival, and decreased overall mortality through early recognition of sepsis (Kleinpell, 2017). Husabø et al.(2020), notes that timely initiation and early recognition of sepsis is critical to the overall survival of those with a sepsis diagnosis. Nurses are intimately involved through the use of evidence-based practices to improve client and system outcomes. Sepsis standards of practice identified evidence-informed decision-making (EIDM) as an essential component of nursing practice to achieve these outcomes (Yost et al., 2015).

Background and Significance

This project was initiated and resulted from a case study of a patient who avoidably died of sepsis due to a lack of nurse compliance and communication between the medical staff. The lack of timely compliance of reported sepsis alerts to the medical team, and the medical team's inaction were significant factors identified in the patient's demise. The facility's timeframe established benchmark was to document and report the sepsis trigger to the medical staff by either pager or phone call within the first 60 minutes of a sepsis alert. A visualization of this alert is presented in Figure 1.

Figure 1

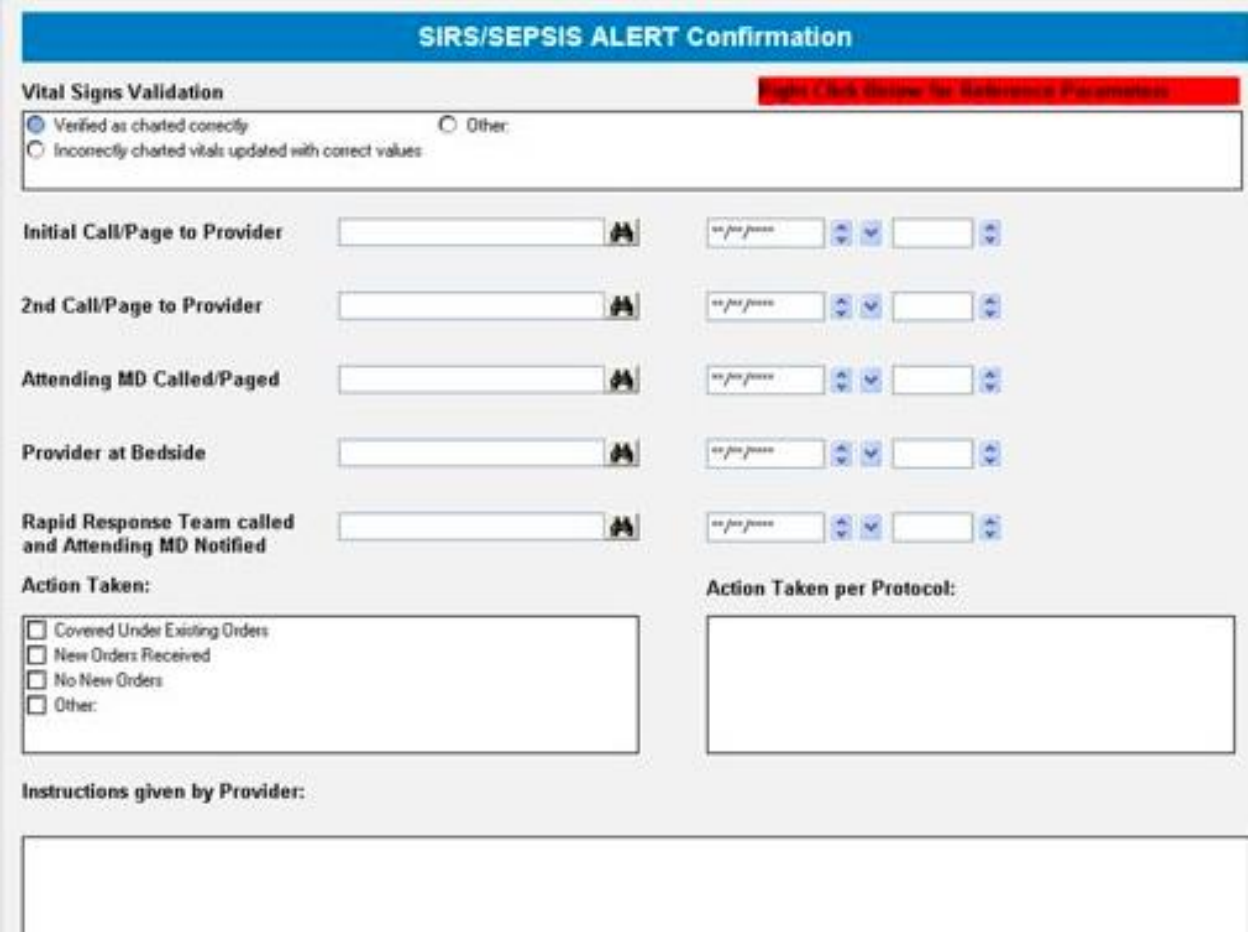
Sepsis/SIRS EMR Alert



Each time the EMR triggers a warning to the staff, someone may save a life if the alert is appropriately reported to the medical staff, followed by the appropriate interventions. When the alert is triggered and is an accurate representation of the patient's clinical picture, a PowerForm is acknowledged. The physician is either called or paged with the current information to include vital signs. It is unsure if the lack of sepsis knowledge on behalf of the collaborative team or lack of agreement between the nurses and the medical staff regarding the trigger's vital signs was the issue. The sepsis champions educated the nurses to call the physician and report the alert with the correct vital signs and draw the automated lactate level. The nursing staff reported little to no response from the medical team for many interventions. The nurse is responsible for determining if the patient's condition accurately represents the triggered alert at the time of the trigger. A visualization of the PowerForm is presented in Figure 2.

Figure 2

SIRS/Sepsis PowerForm



An example of verification of a patient's current condition would be a patient who has a seizure; the heart rate goes up, the oxygen level goes down, and the blood pressure increases because of the episode. The nurse has the responsibility of monitoring the patient and determine if the vital signs are correct as displayed on the monitor. This is important because the monitoring equipment may be dislodged, failed, or it may be off the patient at the time of the trigger. The unit cares for high-risk seizure patients and if the trigger is related to a seizure the vital signs may not be correct. This gives the nurse the opportunity to check a box within the trigger screen that discounts the vital signs as false and further investigate the patient's vital signs and condition. The sepsis alert is still reported with the accurate conditions being given as to what triggered the alert.

This NSICU has a history of under-reporting the automatic SIRS/ Sepsis alerts from the electronic medical record (EMR) that triggers sepsis alerts. As a result, this has placed patients at a higher risk of developing *sepsis* to underreporting to the medical team. The warnings are part of a safety net along with the patient's clinical picture when combined with collaborative rounding enhances patient safety. The alerts work in conjunction with the physician practices, and despite these alerts, the medical team also had missed opportunities of acknowledging the warnings compiled with the patient's clinical picture. According to the Institute of Healthcare Improvement's (IHI) sepsis bundle, the initial goal is to intervene within the first three hours of sepsis alerts (www.ihi.org, 2020). Within the timeframe of sepsis reporting, the first three hours, or "the golden hours, "are the most important in the sepsis cascade intervention. Treatment for Sepsis starts with early recognition, administration of antibiotics, aggressive fluid resuscitation, and vasoactive medications indicative of hypotension (Wheeler, 2015). ICU nurses spend more time with patients than any other discipline during the patient's hospital stay, and their role in the early recognition and treatment of patients with *sepsis* is critical to improving *sepsis*-related outcomes and decreasing in-hospital mortality rates (Kleinpell, 2017).

The timeframe of sepsis is reporting within the first three hours, also known as, *the golden hours,* is the most important in the intervention of the sepsis cascade (Wheeler, 2015). Survivingsepsis.org (2019) notes, ideally, the hour-1-bundle would be the most effective for sepsis identification and treatment. Hour-one's five key elements include: measure lactate level and remeasure if initial lactate is >2 mmol/, before administration of antibiotics, obtain blood cultures, administer broad-spectrum antibiotics, begin rapid administration of 30 mL/kg crystalloid for hypotension or lactate ≥four mmol/L, and apply vasopressors if the patient is

hypotensive during or after fluid resuscitation to maintain MAP ≥65 mm Hg (Levy et al., 2018 & Spiegel et al., 2018).

According to the IHI, in 2018, there were over 750,000 new sepsis cases in the US, with at least 210,000 fatalities. As a result of medicine becoming more aggressive with invasive procedures and more immunosuppression therapies, sepsis incidence will increase even more. An organized process emphasizing early recognition with a uniform and consistent application of evidence-based practices will be necessary to reduce future mortality of severe Sepsis (ihi.org, 2018). Sepsis is a significant health problem worldwide with costs to society that extends far beyond the lost lives. The impact of survivorship has increasingly felt as life expectancy grows due to people living longer with more chronic diseases (Tiru et al., 2015). Medicare paid over six billion dollars in sepsis treatment in 2015, making it the most costly and common ICD-10-CM (A41.9, sepsis, unspecified organism) (www.icd10data.com, 2019) discharge diagnosis. Hajj et al. (2018) noted, Sepsis affects over 30 million people each year and is a leading cause of death in hospitals across the United States and globally. Sepsis has reportedly been responsible for up to 140% higher mortality rates than annual mortality estimates from all other causes. Today, it is still on the rise and affects millions of people a year (Hajj et al., 2018).

After reporting the triggered sepsis alert to the medical team, the intervention is based on lab results and patient condition if the trigger is accurate and requires any intervention. The educational quality improvement project's goal stemmed from the decreased compliance reporting of the sepsis alerts triggered in the EMR. Education is essential in real-time sepsis reporting to stop the cascade of Sepsis and, in the process, save lives. The hospital's Electronic Medical Record (EMR) reporting system notifies the nursing staff if two-three of the patient parameter become outliers; increased temperature > 38 or less than 36 degrees Celsius, increased

heart rate > 90, respiratory rate > 20 or PaCo2 <32 mm hg, and a white blood cell count > 12,000 or < 4,000, and a lactate level 2. The nurse is responsible for determining if the triggered alert is an accurate representation of the patient's condition at the time of the trigger and reporting it in the EMR as correct and alerting the physician or physician assistant (PA). For example, a patient has a seizure, and the heart rate goes up, the oxygen level goes down, and the blood pressure increases because of the episode. The nurse determines if the trigger is related to sepsis or the seizure activity, causing the vital signs changes. The nurse would then check a box within the triggered screen that discounts the vital signs as part of the trigger but still reports the medical team's alert to communicate that an event occurred.

The literature shows that 15-30% of those affected with sepsis die because of septic shock. It is one of the significant risk factors identified in hospital stays, leading to in-hospital death, discharge to hospice facilities, or 30-day readmissions (Mayr et al., 2017). Sepsis had become such a hot button topic that the World Health Organization (WHO) made it the subject of the WHO campaign last year in Geneva, Switzerland. The surviving sepsis campaign aimed to prevent sepsis in healthcare (Saito et al., 2018). Sepsis is a collective entity that affects ICUs in the United States and abroad. Bedside nurses spend most of their day with patients under their care; ICU nurses are critical to identifying, mobilizing, and intervening in the sepsis chain. ICU nurses can help intervene before patients become septic from the lack of identifiable quantifiers that are already in place within most medical facilities (Delaney et al. 2015 & Tylee, 2017). There appears to be a breakdown in identifying sepsis delays in treatment and an increase in the ICU due to not recognizing the signs and symptoms early enough to institute treatment. Timely reporting of sepsis triggers in the NICU could reduce sepsis incidences leading to septic shock and, eventually, mortality if under-reported and not treated (Castelluci, 2017).

Instituting education with reinforcement of the ICU nursing staff's schooling and the medical staff to recognize the sepsis triggered events may decrease mortality rates in the unit and throughout the hospital as patients transfer off the team to step-down units and the floor. Education, along with compliance, may be vital to decreasing mortality in the ICU. The ICU staff's knowledge base should be highest because of the ICU's sickest patients' admission. Identifying and intervening early in the sepsis triad before patients begin to deteriorate rapidly must become second nature to the nursing staff to decrease mortality. If the knowledge gap is one of the non-compliance issues, an educational intervention should close the gap. This doctoral project will attempt to address this need through evidence-based education of current sepsis standards and guidelines.

Needs Assessment

A year before starting the sepsis QI project, the unit's sepsis compliance reporting was 64%, with an average reporting time > 2 hours. From September 2018, three were two unit-based sepsis champions assigned to the unit to look at sepsis compliance through monthly retroactive chart reviews. The sepsis champions would then send an email to the staff member regarding their compliance with the alerts within 60 minutes. The unit champions sent out another email to the staff who did not meet the hour goal for reporting, reminding them of the unit's goal and an invitation to meet to discuss any questions or process issues they may have meeting the 60 minutes reporting time (see Appendix C).

A SWOT analysis guided the project towards increasing compliance reporting of sepsis alert acknowledgments and increasing one-hour report compliance (see Appendix D). The strengths and weaknesses of the internal factors analyzed with the strengths were; strong stakeholder buy-in, planned intervention is evidence-based in literature, the facility supports

decreased sepsis occurrences as mission-driven, and facility promotes health and well-being. The sepsis objective aligns with the organization's mission, and there is recent funding for an approved sepsis team in the organization. The weaknesses identified are; change is difficult to manage with RNs and MDs, no sepsis category on current rounding sheet for ICU or step-down/general patient population and employ off-service rounding teams to use current rounding sheets. Sepsis increases LOS, readmissions, and medical costs for the organization. A strength of the EMR system is the trigger alerts that do not go away until acknowledgment.

External factors that supported the health system's opportunities included a meeting with a representative of the quality department to determine organizational opportunities and attendance to monthly hospital sepsis meetings. The external threats include; ineffective communication between the RN shifts, day and night shifts, ineffective communication between RNs and physicians, inadequate follow-up, and inefficient monthly reporting during unit practice council. Before the project, there was no dashboard in place for comparison from year to year, and the most challenging was the few employees who were not receptive to change. The evaluation of the objectives was strong stakeholder support, buy-in, data-driven institution, and a facility that is both evidence-based in practice and a mission-driven facility. Patient safety was and is paramount to the organization. The organization supported the sepsis committee's changes to minimize weaknesses and threats necessary to meet the national benchmarks' unit and hospital top tiers.

The internal threats included increasing unit nursing education 1:1, redesign step-down rounding sheets and share follow-through during physician rounds, creating a dashboard to track improvement and share at the monthly unit practice council meetings and re-engage current unit sepsis champions. It was undetermined if the unit's current compliance rate resulted from

noncompliance or an educational gap for the nursing staff. The educational needs stemmed from the low agreement of the triggered sepsis alerts in real-time or as close to one hour as possible. The low agreement between the dayshift and nightshift staff stemmed from the medical team's availability for reporting. Some of the nightshift staff were under the impression they could report the alert in the morning when the medical staff rounded, and on weekends the medical team left the building in the evening. During this project, the sepsis champion revealed that the on-call physician did not return calls or pages when the staff notified them of sepsis alerts because they felt the nurses were bothering them at home or in the call room while they were sleeping. When the nursing staff called or paged the medical team, they often got no return phone call to acknowledge the page the nurses sent.

Often, the medical staff met the nurses with aggression on the other end of the phone, which discouraged the newer nurses from reporting the alert. Before starting the project, the percentage of reported sepsis alerts in one hour of the trigger was only 64% (Shannon Riordan, personal communication, September 12, 2018). This low percentage is also because of the under-utilization of the electronic medical record triggers embedded in the St. John's sepsis program for nursing staff. The unit physicians, Nurse Practitioners (NPs), and Physician Assistants (PAs) do not receive the sepsis triggers because the nurse can physically see the patient and make sure the triggered vital signs are correct. The medical staff has too many patients throughout the hospital to visualize, in real-time, each patient who has a triggered sepsis alert. After the nurse checks the patient, the nurse will then page or call the physician to give interventions. It is paramount that the nursing staff report the sepsis alerts as soon as they are triggered or within the first hour of a warning to decrease risks associated with developing sepsis, septic shock, and mortality. Internal threats minimized with increased nursing education, redesign step-down rounding sheets, share

follow-through during physician rounds, create a dashboard to track improvement to share at monthly practice council, and re-engage current unit sepsis champions. The evaluation of the objectives was strong stakeholder support, facility buy-in, a data-driven institution, and a facility that is both evidence-based in practice and mission-driven. Patient safety is paramount, and the organization supports the changes to minimize weaknesses and threats to meet the unit and hospital by attaining top tiers of the national benchmarks.

Problem Statement

Decreased nurse compliance in timely notification of the one-hour window for sepsis reporting from the data triggered through the electronic medical record system (EMR) on the NSICU may lead to adverse outcomes and increased mortality rates for the patient population on the unit and hospital-wide.

Project Aim

The project's purpose was compliance reporting of the triggered sepsis alerts in the EMR. Increased adherence to reporting to the medical staff within one hour of the sepsis trigger should result in an overall decrease in sepsis, septic shock, and—mortality in the NSICU. Zink (2018) notes, the EMR sepsis alert is the intervention that the clinicians receive through the delivery method of Cerner's Discern Notify alerting system. When a patient meets the criteria established for a SIRS or sepsis alert, based on a background sepsis-detection algorithm, which is continuously running in the system's background, a to-do box appears in the bottom left-hand corner of the chart. The red icon at the bottom of the screen stays until the alert is acknowledged by clicking on it and managing it. There is also an icon in the right lower corner with an exclamation mark in it that will remain red to indicate there is a sepsis alert that has been triggered and not acknowledged by the nursing staff. The goal to improve reporting is to achieve

equal to or greater than 90 percent of compliance reporting (the organizational benchmark) of the sepsis triggers within the first 60 minutes of the EMR trigger. The sepsis champions also reinforced the importance of the 3-hour Surviving Sepsis Campaign guideline recommendations to the nurses with the rationale to decrease sepsis.

Objectives

The principal investigator (PI) aligned each objective of the project with the eight DNP essentials I-VIII (American Association of Colleges of Nursing [AACN], 2006).

- IRB approval from Bradley University to start my QI project by the third week of August 2018 aligns with American Association of Colleges of Nursing (AACN) (2006) *DNP Essential I: Scientific underpinnings for practice* through the nursing actions or processes by which positive changes in health status are affected was addressed.
- AACN *DNP Essential II: Organizational and systems leadership for quality improvement and systems thinking* through advanced communication skills/processes leading to quality improvement and patient safety initiatives in health care systems relates to the objective that the medical staff acknowledge the nurse's page and phone call when a sepsis alert is triggered by the end of December 2019 after the project. This evidence will be reported on the nursing staff's documentation form in the EMR on the sepsis datasheet.
- NSICU nurses will enhance their understanding of the importance of the EMR sepsis triggers and report them within the 1-hour window by the end of December 2019, after the DNP student's education for the sepsis encounters aligned with the AACN (2006), *DNP Essentials III: Clinical scholarship and analytical methods for evidence-based practice* was met through the direction, evaluation, and design of a quality improvement methodology to promote effective, safe, timely, efficient, equitable, and patient-centered care.

- The objective to have a meeting set up via phone with IT director by the second week of September 2018 aligns with AACN, *DNP Essential IV: Information systems/technology and patient care technology for the improvement and transformation of health care* through the analysis communication of critical elements necessary to the selection, use and evaluation of health care information systems and patient care technology.
- *DNP Essential V: Health care policy for advocacy in health care* was met through education of others, including policymakers at all levels, regarding nursing, health policy, and patient care outcomes (AACN, 2006). I carried out this essential by obtaining a completed list of all nurses on the unit for enhanced education with my team-members' assistance on the correct submission of the fired sepsis alerts from EMR by the first week of August 2019; and developed a plan for small-group education for new hires (RN) monthly during their unit orientation-30-minute presentation with a Q & A post-presentation by the end of March 2019. I also sent a detailed email with plans for the project and what is desired from the staff for participation with the project's reason during the project's QI roll-out phase by the end of September 2019 (see Appendix E).
- AACN (2006), the *DNP Essentials VI: Interprofessional collaboration for improving patient and population health outcomes* through consultative and leadership skills with interprofessional and interprofessional teams to create change in health care and complex healthcare delivery systems was also met by this project. A dashboard captured all data necessary for reporting monthly to the unit practice council with monthly completion rates noted and an overall unit percentage of capture and data shared with the medical team by the end of January 2019. I created a Neuroscience ICU power-point on the shared facility website highlighting the uniqueness of sepsis patients on the Neuroscience patient population

and what data we are capturing on this patient population that may be different on other ICU units by the end of March 2019. I also, created a sepsis poster on the unit to share the information of sepsis data from the literature research and our initial completion rates when the project was introduced in May of 2019 (see Appendix F).

- The NSICU nursing staff will increase their reporting of sepsis triggers and report greater than 90 percent of the triggered alerts by the end of December 2019 aligns with the *DNP Essential VII: Clinical prevention and population health for improving the nation's health* was met through evaluating care delivery models and strategies using concepts related to community, environmental and occupational health, and cultural and socioeconomic dimensions of health.
- The NSICU nursing team will show their increased awareness. Reporting will be evident in the increase in compliance of reporting with a compliance percentage greater than 64%, which was the starting point before the project. This objective aligns with the AACN (2006) *Essential VIII: Advanced nursing practice* through the guidance, mentoring, and support of other nurses to achieve excellence in nursing practice.

Clinical Question/PICOT

For nursing staff in the Neuroscience Intensive Care Unit with decreased compliance reporting to the medical team of embedded triggered sepsis alerts in real-time, does 1:1 education increase compliance?

Congruence with Organizational Strategic Plan

Centers for Medicare & Medicaid Services (CMS) (www.cms.gov, n.d.) partnered with Virginia hospitals, including the project healthcare system, to provide the same initiative of sepsis interventions to decrease sepsis admissions from outside hospitals to the project healthcare

system. This strategic initiative includes case studies admitted from other facilities, nursing homes, and regional or statewide collaboratives to review processes; lessons learned and assist other systems in decreasing sepsis mortality rates (Smith et al., 2017). Sepsis education and nursing knowledge align with the organizational strategic plan for the project healthcare system (www.virginiacommonwealthhealthsystem.org, 2019). A unit-based and hospital-wide sepsis committee meets monthly to share data, compliance, and best practices among the facility's units. The unit committees report to the hospital-wide chair, which sits on the hospital-wide critical care committee, which in turn, reports to the chief nurse and medical committee.

Synthesis of Evidence

A review of the literature to research was done using CINAHL, Google Scholar, Cochrane Library, EBSCO, Sepsis Alliance, and MEDLINE. The keywords used for this search were: *sepsis, continuing education, knowledge, attitude, practice, electronic health record data; mortality, predictive modeling; severe sepsis; surviving sepsis campaign guidelines, SIRS, hospital mortality, care bundle, antibacterial agents, antibiotics, septic shock, shock recognition, the timing of antibiotics, and early recognition*. Using the search and the Boolean phrase: sepsis, *severe, severe sepsis, SIRS, mortality, economics, quality of life, septic shock, lactate level, nurse education, and intensive care unit.* MeSH terms in PubMed *epidemiology, mortality, economics, quality of life,* and *statistics* were utilized to obtain 51 articles for review. Of these articles, 20 did not apply to the project or excluded as being of inferior quality, poor design, or out of date for the project search criteria of the last five years or less. Search criteria included the terms: ICU, length of stay, adherence, increasing adherence, and a range of factors that affect the length of stay. The following databases used to research sepsis evidence were the Cochran database, OVID, google scholar, EBSCO, and CINAHL. The literature synthesis's purpose was

to identify the underlying theme of early sepsis recognition and practice-based inter-professional collaborative interventions to improve healthcare processes and outcomes while lowering mortality rates.

Appraisal of Evidence

A total of 35 articles from 2015 to the present was selected as relevant or contributory to guide the project development. Numerous factors affecting the length of stay were also examined as this information may benefit the healthcare team in directing care for the patient throughout their hospitalization. The dominant themes were classified, addressing outcomes, epidemiology, quality of life, and societal costs of sepsis. Early detection and the beginning of therapeutic interventions in patients with sepsis are part of the critical care nurse's pivotal role in decreasing sepsis prevalence in the ICU. Of the 25 articles in the Evidence Evaluation Table (EET), 20 were used to appraise this project's evidence. There are five levels one articles in this EET, seven-level two articles, six-level three articles, one level four, and one level five articles.

The strength of the research articles demonstrated a strong correlation between early intervention for sepsis (within one to three hours at the onset of symptoms) and better patient outcomes with decreased mortality. Other strengths of the articles showed a “predictive validity measured by hospital mortality that was predicted by the quick sequential organ failure assessment (qSOFA) score (primary) and SIRS criteria (secondary)” Rudd et al, 2018, p. 1). The higher the qSOFA score the greater the chance of mortality Recurrent themes of the articles' weaknesses include the sample size in some groups that were too small, limiting the strength of some associations, and the ability to generalize results. Several articles with “limitations of studies included differences in ICUs features in terms of facilities, equipment, and type of

patients" (Yousefi, 2012, p. 4). Another limitation was that the subjects could achieve diverse information levels through mass media, books, or articles, consequently influencing the study.

The gaps in knowledge were noted in a few articles that included clinical symptoms and indicators missing for some septic patients included in the reviews. And could not be confirmed, which may have led to bias in some of the research findings published (journals.lww.com, 2020 & Zhao et al., 2020).

Synthesis

Several articles showed complementary research that indicated the best timeframe for sepsis intervention is between one and three hours (Rudd et al., 2018 & Odden et al., 2015). Many articles were congruent in the literature regarding the lactate levels, the timing of antibiotics and sepsis reporting triggers (Levy, 2019). Lactate levels are essential pieces of information to start the interventions and point to sepsis if the lactate level is >2. Nurse education and early recognition signs are necessary if the ICU nurses are to intervene in the sepsis cascade to improve patient outcomes and decrease mortality. Interestingly, ammonia levels were also discussed in the literature as a predictive indicator of to determine if the "serum ammonia level is also a suitable early indicator for prognostic evaluation of patients with sepsis as well as increased lactic acid lab levels" (Zhao et al., 2020 , p. 1 & Numan, 2018).

Early Recognition

The earlier sepsis is recognized the faster the diagnosis, interventions of treatment, and antibiotics can be administered in an effort to help decrease mortality rates. (Husabø et al., 2020). Kim & Park (2019) and Sterling et al. (2015) noted that early recognition appears to be the key to decreasing mortality and increasing survivorship in septic patients. Lactate levels are among the essential identifiers for medical professionals to help in the early recognition and

treatment of sepsis. Yousefi et al. (2015) note that the ICU nurses play a significant role in preventing, detecting, reporting, and implementing sepsis interventions. ICU nurses care for the sickest patients in the hospital. This patient population's probability of going into septic shock is highest after high-risk surgery and while recovering in intensive care units. Another article by Sterling et al. (2015) agrees with the available data associated with antibiotic administration timing and increased mortality. Severe sepsis decreases when interventions are recognized and implemented between the one and three-hour window timeframe.

Early Interventions

As noted by several authors throughout the literature searches, early interventions or bundles proved to have positive outcomes and decreased mortality (Schorr et al., 2016, Odden et al., 2015, Pruinelli et al., 2018 & Scoligard, 2016) noted the positive outcomes in his article with early identification of sepsis in hospital inpatients by ward nurses with an increase of a 30-day survival rate. Pruinelli et al. (2018) noted that the overall theme of delayed treatment for sepsis is safe. Modest delays of less than 50 minutes may not be harmful in a clinically meaningful way. Still, any delay more significant than 50 minutes equals an increase in harm outside of an intervention's first hour. Being outside of the three golden hours window with responses of opportunity is severely harmful to patients and dramatically increases mortality rates. The importance of the Surviving Sepsis Campaign 3-hour guideline recommends that every time sepsis is suspected, the following is to be done within 3 hours:

- Obtain a blood culture before antibiotics.
- Obtain a lactate acid level.
- Obtain broad-spectrum antibiotics.
- Administer 30ml/kg of crystalloid fluid for hypotension (Pruinelli et al., 2018).

Leisman et al. (2016) proposed aggressive adherence to the 3-hour sepsis bundle would decrease mortality and the cost of sepsis or septic shock versus non-compliance of any one of the bundle elements alone. Another article by Moore et al. (2019) demonstrated that sepsis bundles' and early nurse intervention were enough to decrease septic outcomes through compliance. Early recognition of sepsis is critical to patient outcomes. Emergency room nurses are often the first to assess patients for sepsis since it is often the entry point into a medical facility. The use of Detect, Act, Reassess, & Titrate (DART)-based checklist and communication tools used in this area showed promise for decreasing mortality through their early intervention tool. The emergency room project with the DART-based checklist for communication results suggested the nurse-driven protocols help facilitate the rapid implementation of treatment interventions that positively impacted meeting the metrics and resulted in positive patient outcomes and shorter hospital stays.

Interestingly, a few articles also included the use of ammonia levels as an indicator of sepsis and length of stay (LOS). The ammonia levels were not used to indicate the length of stay for this project and are not currently used in the present facility. Zhao et al. (2020, p.1) noted, “in predicting the 28-day mortality rate for LOS, the ammonia level, C reactive protein, SOFA score, and the leukocyte were independent risk factors for the mortality rate “. In conclusion, elevated ammonia levels can be a biomarker for sepsis, compared to conventional markers. High ammonia levels also have a predictive purpose and were associated with determining extended hospital stay.

Education of Nurses

Although limited, the research revealed several studies that established the impact of a nurse-led sepsis screening process to improve early recognition of sepsis (Kleinpell, 2015). The

literature search limitation for nurse education and sepsis seemed to be a consistent theme throughout the literature search. It is a fundamental concept that is interesting and relevant to the project because it appears to be a compliance issue related to education and a lack of early sepsis identification. In 2007, as a result of marginal effects of sepsis death rates, the focus focused on designing programs that would be readily used by nurses to ensure early recognition of patients showing signs suspicious for sepsis and well as the institution of an evidence-based intervention to diagnose and treat it (Jones et al., 2015). Kleinpell (2015) noted a study done in New Zealand, called the *Sepsis Six* resuscitation in which bundles of care were used to increase knowledge among the staff and helped to improve sepsis patients' management and outcomes. This bundle addressed the care in six specific areas of sepsis care which included: starting intravenous fluids, obtaining blood cultures, starting antibiotics if indicated, drawing a lactate if indicated, the application of oxygen, and monitoring urine output. The nursing staff and junior physicians were provided education with an algorithm poster available to be served as a visual reminder to implement the bundle. A periodic audit and feedback were provided to the staff which showed an improvement in the number of bundle measures that were implemented within a one-hour timeframe, and the outcomes were increased from 29% pre-intervention to 63% post-intervention.

Delaney et al. (2015) noted that nurses must be knowledgeable, competent in the early identification and care of patients with sepsis since sepsis was an emerging healthcare issue as far back as 2015. The authors noted that sepsis education programs should be designed specifically for nurses to empower them with the tools needed to recognize patients in the initial stages of sepsis, mobilize the healthcare team, and implement appropriate interventions to influence patient outcomes positively. Raines et al. (2019) noted the high number of patients

diagnosed with sepsis before an important finding reinforces the need to provide sepsis education to non-ICU nurses early identification and timely treatment of these high-risk patients. Yost et al. (2015) noted that knowledge translation interventions directed to nurses in tertiary care were more effective for improving evidence-informed decision-making, knowledge, skills, behaviors, and client outcomes. The nurse's role or how education improves outcomes has been thoroughly documented in many peers reviewed articles. One such example is an article by Chmielewski et al. (2019) noted by using floor nurse champions to have 1:1 conversation with their team members allowed the team to identify specific contributing process barriers to achieving bundle compliance, respond to objective barrier trends once identified, and reported to medical staff promptly. As a result of the implemented improvements, the staff also received education regarding antibiotic therapy and IV fluids documentation in the EMR. It was further noted that the staff responded better to peer education than to leadership because it was much more informal and more constructive peer to peer. Flinkman et al. (2016) agreed that competence is a crucial attribute for assuring high-quality, ethical, and safe nursing care in early recognition and sepsis treatment.

Theoretical Framework

The framework that best fits this project is Knowle’s adult learning theory. This theory, chosen because the team requiring education are adult nurses of different generations and genders, was the correct QI project framework. Knowles's approach to education best seeks to describe adults' principles and how they learn with examples of the best strategies for this population. Malcolm Knowles has five assumptions regarding adult learners, which applied to any adult educational situation, explains the staff's different mindsets and their point of view of the importance of the project (Papas, 2013). The first concept is one of maturity. As adults, we

are supposed to become less dependent on others and more self-directed and reliant. Knowles's assumptions best fit the nursing staff on this unit, which encompasses different generations. Nursing staff on this unit vary from transitioning from a graduate nurse with less than one year of nursing experience to a novice nurse with a year or more experience to an experienced nurse with five years or more of experience. An example is sepsis generated triggers in the EMR, and the protocols not followed based on inexperience or lack of knowledge. The second assumption is the accumulation of life experience. As the adult becomes more proficient in her/his practice, they slowly transition to an official or unofficial resource for novice learners.

There are different age groups and genders on the unit, and some of the younger nurses have less life experience than the more mature nurses, and there was some immaturity about following the sepsis protocols and procedures associated with an actual sepsis trigger. Nevertheless, some more mature adults seemed to be "burnt-out" and were not as keen to follow the protocols of promptly reporting the sepsis triggers. The third assumption is the readiness to learn, and as we mature, our willingness to learn attaches to the responsibilities we share at work. A charge nurse may be more inclined to follow policies than the bedside nurse. The fourth assumption is an orientation to learning. The adult learner shifts their direction of learning from subject to problem-solving, which needs to happen for sepsis reporting and compliance. The last assumption is one of motivation. As we mature, the motivation to learn becomes more internal and perhaps the most challenging assumption to overcome because tangible items drive some people, and others are excited to learn by nature. Getting a unit champion involved in the education of the staff for sepsis bundles was the key to increasing compliance and thereby increasing the unit's percentage of reporting to align closer to the strategic initiative of the

hospital of 100% compliance of reporting and initiation of the sepsis bundle to decrease patient mortality hospital-wide.

Chapter II: Methodology

Project Design

the facility at the end of their residency. As an urban medical center, it also has diverse patient populations from those who are indigent to those who are famous. As a result of the facility's reputation patient s are brought either by ground transportation or ambulance if they need one of the specialties that the facility employs. My own memory includes a very famous singer who performed a show in the area and had an accidental fall, the chance to meet a legendary civil rights activist who was involved in an accident with their church group while traveling and the accident occurred in in the area and with multiple hospitals in the area, this facility was the hospital of choice. Most recent memory was a well-known actor who was a visitor on the unit.

The proposed project is a sepsis quality improvement project to increase the percentage of sepsis compliance reporting in the NSICU. To achieve goals for the project, the nursing staff needed to improve timely communication to the physician. This is done to ensure the physician rounds on the patient at some point during the day. If the patient is symptomatic and the nurse cannot get in touch with the PA, they are to call the attending physician, and if he/she cannot be reached call the rapid response team (RRT). The sepsis team responds to RRT alerts and code sepsis alerts for patient rescues on the floor and stepdown units. The Neuroscience Intensive Care Unit has 27 total beds, including the three stepdown beds. The NSICU is in the critical care tower of the project site in an urban setting. The project site is an 865 licensed bed, level one trauma center on the east coast.

Setting

The study took place in a facility that was an early adopter of the SIRS and sepsis alerts, in partnership with their primary healthcare information system vendor, Cerner Corporation. The hospital is in an urban city with 865 beds (Zink, 2018). The facility is the region's only Level I Trauma Center and is a referral center for the region on the east coast and state of Virginia's surrounding states. The project's setting is a teaching hospital with nurses, medical students, residents, and interprofessional teams who collaborate throughout the day. During this QI project I had the opportunity to work with many diverse groups. The diverse groups included the patient population, families, and some staff. To serve the needs of this diverse population it was important to be able to serve these patients and families according to their cultural beliefs. An example is a female patient that does not want a male caring for them due to their cultural or societal norms. Also improvising when there was a language barrier and using the resources available to me to help explain some of the nuances of the project such as multiple lab draws for lactate levels based on their triggered sepsis alerts. Diverse staff can be challenging as their background of working with American nurses may be different than it is in their countries due to a more broaden scope of practice that the American medical collaborative team values. The collaborative medical team that is used on the NSICU allows nurse to give input into the patient's care during rounds and suggestions are often carried out based on the primary nurse's suggestion. This rare opportunity to work with many diverse groups has allowed me to meet the challenge while carrying out my QI project in this facility.

This facility is a renowned level one trauma center and the medical school has contracts with different countries to train their students and some of the physicians are employed at

The focus of the project is the three- bed step-down unit within the ICU. The sepsis alerts only trigger for patients who have transfer orders out of the NSICU or who are in one of the

three stepdown beds on the unit. It is essential to note that the patients who have an order for the level of care to be intensive care will not trigger a sepsis alert because they are some of the sickest populations with unstable labs and vital signs. The system is built to turn on based on the order for bed assignment The trigger embedded in the EMR will only trigger sepsis alerts according to the order sets for patients with any other care level other than intensive care; orders for stepdown, floor beds, transfer to rehabilitation and discharge from the ICU. Excluded beds from the project and the patients in these beds may be outside the critical stage, and the sepsis trigger may never trigger during their time on the unit. The Neuroscience Intensive Care Unit has 27 total beds, including the three stepdown beds.

Population/Sample

The proposed sample size was the 75 nurses in the Neuroscience Intensive Care Unit. The nursing staff included all the team members, regardless of benefitted position status, and comprised both dayshift and nightshift nurses.

Tools and Instruments

The EMR system used for the project is a Cerner product. The hospital-based tool used for sepsis alerts was the Sepsis Surveillance Agent also developed by Cerner. The sepsis alert system is a clinical decision support system with real-time surveillance and electronic alert notification capabilities (Amland & Sutariya, 2017). PowerForms (see Figure 2 above), the electronic version of the sepsis form in the EMR that the nurse needs to fill out in the EMR system. PowerForms were used to document the timeframe from the time the alert was triggered in the computer to the time the nurse acknowledged the alert. To acknowledge the alert, the nurse fills out the PowerForm and notifies the physician that a sepsis alert has been triggered. The nurse usually pages or calls the physician and if they do not get a response back within one hour

they are to call the attending physician and report to them that resident has not called back within the hour. This was established when the hospital-wide sepsis team was formed and is in line with the organization's strategic plan and benchmark of 90% compliance. It was felt the attending physicians would be able to get the residents to comply better than the nursing staff since they were their direct reports. Only the clinician could see the Powerforms with the raw data. After it is de-identified without the patients identifying information and the nurse responsible for acknowledging the triggered alerts within the hour timeframe. The data was kept in a locker with a combination lock until the end of the project and then it was properly disposed of in a secure shred box that is maintained by a professional security team. Qualitative Research methods used for this project included; direct interaction with individuals on a 1:1 educational basis, retrospective and real-time chart reviews, observations of nurses on all shifts, shifts during sepsis alert firing, direct communication with nursing staff on days, evenings, nights and weekends, after the intervention was applied which helped to determine the degree of success of the QI project (see table 3).

Table 3

Sepsis Data Compliance Tool/Instrument

Order Type	Order Trigger Date	Powerform	Total N	Number completed	Powerform Time	PFT-OTT	HR	RR	Temp	WBC	Band

Project Plan

During week one of the project in September of 2019, the team identified included a mentor, the unit sepsis champions (two unit nurses and the DNP student), the principle investigator (PI), and the PA assigned to the Neurosurgery team, who will be the point person on the medical team to whom the nurses will report sepsis triggered events. The PA was identified as the point person on the medical team because she was more easily accessible to the staff and responded faster to pages and phone calls. The PA assigned to is also available to assist with ordering the correct interventions for patients who exhibit reported sepsis signs. The detailed description of the interventions for the project started with an initial meeting with the QI project DNP student and the project mentor by the first week in September of 2019. Together it was decided that based on some of the unit's educational needs assessments, sepsis was high on the list of needs. The sepsis compliance was 68% at the beginning of the QI project and the education was relevant to the nurse's practice. There was a development of a PowerPoint presentation by the end of October 2019, regarding sepsis that was specific to the Neuroscience population that was added to the hospital SharePoint site. The education focused on the use of patient inclusion parameters for suspected or confirmed infection, which includes greater than or equal to two systemic inflammatory response syndrome criteria, systolic blood pressure less than 90 mmHg, greater than 40% decrease from baseline or mean arterial pressure less than 65mm Hg or confirmed infection as a mean to intervene (American Hospital Association, 2018). Seizure patients trigger an alert based on diagnoses and signs and symptoms exhibited during their stay, for example, a seizure patient may trigger the alert several times a shift based on the number of seizures they may have.

The nurse education was carried out by the DNP project student with each of the nurses on the unit by the end of December 2019. As the QI project person I had to change my shift to meet with different nurses and work extra hours and weekends to make sure I was able to sit with each nurse and go over the sepsis data and the alerts that were triggered by their patients or choose a patient who was not assigned to them to show what the trigger looked like, where it was located, and what the nurse's responsibility was when the trigger was fired. I was able to teach night nurses at the change of shift and by working evenings I was also able to educate the nightshift nurses from 7pm -11pm when I changed my shift to work 3-11pm. The dayshift nurses were educated when I worked 7am-7pm and I worked weekend shifts for those nurses who were on weekends only shifts.

A sepsis poster was created by the end of November 2019, to share sepsis data to staff and visitors on the unit. A color-coded dashboard was created by the end of October 2019 and is currently in use and presented each month at the monthly unit practice council (see Appendix G). This dashboard displays the regression or progress each monthly and will assist with the sustainability of the project. The stepdown rounding sheet was redesigned to include the question of a triggered sepsis alerts during the shift (see Appendix H). This redesigned sheet will encourage the discussion of alerts during rounds the next day, making the whole team aware of potential issues to be addressed. Early in the project planning, the last week of September 2019, I met with the Information Technology (IT) member via a phone call to discuss the EMR sepsis alerts to see if they were modifiable. Any improvements brought to light during the project's inception to completion may benefit the hospital. It was encouraged to go through the IT committee to submit changes that needed to be changed. There is one member of the NSICU nursing staff that is on the IT project team and suggestions were made and submitted. One of the

suggestions made was to have a lactate label triggered and available to the nursing staff when the sepsis parameters were correctly identified by the nursing staff when an EMR alert was triggered. This change was routed through the sepsis committee and changed in the EMR because of the issues surrounding the lack of communication between the nursing staff and physicians.

It was discovered by the DNP student that the medical team does not get the sepsis alerts because the sepsis alerts are linked to the patients that the nurse establishes a relationship with on the day that they are assigned to the patient. When educating the PA on the team about the sepsis alerts we attempted to pull up the same screen the nurses use for sepsis alert reporting and that is when we discovered the medical team does not have the same screens available to them. At the beginning of a nursing shift the nurse is assigned to a set of patients that they will care for during their 12-hour shift. The nurse then establishes a relationship with the patient through the EMR system so that they will have access to their patient's data for the shift while caring for the patient. This is how the EMR triggers alerts to the nurse caring for the patient and not all nurses on the unit. The medical staff does not establish relationships with patients because they have patients throughout the hospital, and they would get an overwhelming number of alerts throughout the day. The decision was made to not include the alerts in the medical staff's profile for patient lists. The PA on the project team was educated about the project, the sepsis alerts and the nurse reporting expectations to the medical team. The PA in turn educated the rest of the collaborative medical team. The DNP student reported this fact to the chair of the hospital-wide sepsis committee and the information was relayed to the chief nurse, who is the administrative executive of the sepsis committee, and she reports nursing issues to the chief of the medical staff

and he discusses issues with the head of each medical department. This is how information gets passed between the nursing staff, administration, and the medical team.

Data was gathered using the Sepsis Data Collection Tool form and saved the data on thumb drive in a locked locker (Table 3). The project mentor shared deidentified information from the sepsis alerts from the PowerForms alerts that were triggered the EMR weekly (see Appendix H) to the principle investigator. This data was used to determine the RNs who needed more education and to see the monthly sepsis data compliance trends. The appraisal was done monthly and the information was used to create the dashboard and educate the nurses for educational reinforcement. Weekly to bi-weekly meetings occurred with the DNP student's mentor for input and appraisal of project deliverables throughout the DNP project. After the implementation of the additional education, there was the expectation that the intervention increased knowledge and learning has occurred. The percentage of compliance to sepsis alerts measured the evaluation of the project after four months.

The sustainability of the project will be the poster board in the unit as a continued reminder of the sepsis education, and the shared PowerPoint on the hospital website, the monthly meetings attended by the DNP student as the unit sepsis champion for the unit and the continued report of the month to month sepsis compliance data via the newly created dashboard at the unit practice council. The timeline for the project started in September of 2019 and ended in December of 2019 to have 4 months of data to evaluate for sepsis compliance with 1:1 education of nursing staff by the DNP student (see appendix I).

Data Analysis

The data analysis at the end of the project used a simple before, and after compliance percentage graphed to analyze the change after the intervention was applied. This analysis

determined the degree of change and the increased compliance percentage of triggered sepsis alerts by the EMR. Additionally, the overall rate of NSICU compliance was collected from an EMR query by the DNP mentor via a monthly standardized computer program that the hospital uses. The patient's data was deidentified and passed on to the QI project student for the percentage of compliance for the month based on the number of triggers, the time the trigger was acknowledged, and the time the nurse notified the physician. This information was put into a monthly dashboard and reported out to the staff in a unit practice council. The ongoing education by the DNP student with the nursing staff to assist in the increased compliance was a two-prong approach to increasing the unit's compliance with the goal of increasing the compliance rate to greater than 90 percent. As a member of the sepsis and mortality committee member the DNP student is made aware of the team's increased compliance as reported through the sepsis committee. The mortality reports are sent to myself and my mentor to evaluate when a patient has died on the NSICU as a result of sepsis my job is to evaluate where the breakdown in the sepsis cascade happened and the improvements that are suggested from the unit level and the hospital level as a failure on the facility's part that may have contributed to the patient's demise.

Institutional Review Board/ Ethical Issues

The Institutional Review Board (IRB)/Ethical issues were addressed from the facility level (see Appendix J) and through Bradley University's Committee for the Use of Human Subjects in Research (see appendix K). The facility's IRB issue of the patient's HIPPA rights was accomplished through the monthly compliance data that was de-identified by the project mentor and then given to the DNP student who locked the information in a locker away from other staff on the unit and was destroyed in a global shred bin on the unit. Approval for the project was obtained on August 18, 2019. The QI project included a retrospective and a real-time

chart review and no reasonably foreseeable risks, discomforts, hazards, or inconveniences to the research participants. There was no direct benefit to participants as this is a chart review process, and no physical participants used for the QI project.

This QI project did not involve physical patients during the project. The privacy of all patients whose charts were reviewed by and done in the unit clinician's private office away from others who may see their HIPPA protected health information (PHI). Because of the patients' PHI, information used from the patient data or chart review was kept confidential. The information used in the QI project was redacted names of the patient and keep the integrity of the data safe. Those team-members permitted to access all information sources about the participants were the student principal investigator, hospital mentor, and one-unit sepsis data abstractors (Shannon Riordan, a unit sepsis-member RN) who is also a member of the unit and hospital-wide sepsis committee. The information included in the extracted data contained medical record number, patient name, diagnosis, vital signs, labs, and treatments at the fired sepsis alert. The stored data was on principle QI investigator's private encrypted thumb drive and was locked in the investigator's locker with a combination lock on the locker for safety. The data stored for approximately six months and the only person with access was the student principle QI investigator. The de-identified data and aggregated was shared with the staff on the unit at the unit practice council and with the hospital-wide sepsis committee for discussion. It was also shared with other researchers for possible replication to be used in future studies.

Chapter III: Organizational Assessment and Cost Effectiveness Analysis

Organizational Assessment

The organization has been working with the sepsis alert system, embedded in the EMR, for almost five years with no real traction for compliance of reporting in the ICU. The IHI sepsis

bundle notes that sepsis treatment within 3 hours found to decrease mortality. During the project the hospital-wide sepsis team discussed creating a full-time sepsis coordinator as part of the Rapid Response Team (RRT) for the facility to respond to all RRTs in the event the RRT was related to sepsis. This addition of the sepsis coordinator to the RRT team will keep all units functioning and reporting the same information during code sepsis alerts. This will help to institute stability and uniformity throughout the facility. The creation of the sepsis coordinator would also help to monitor and implement sepsis strategies for the organization. The sepsis coordinator is in line with the organization's future strategic goal to form a sepsis team with an overhead alert system announced when a patient comes into the emergency room from an outside source. The facility sepsis coordinator uses data from the sepsis alliance website to update the members of the committee and to ensure we are in alignment with other national sepsis programs world-wide. Most recent discussions around COVID 19 and the similar presentation seen with sepsis patients in the facility makes this website essential to assisting in decreasing mortality and increasing better patient outcomes in our facility.

The NSICU staff can call an RRT for sepsis patients on the unit to assist with a rapidly declining patient's condition in the absence of an available physician. If the staff has attempted to get in touch with the medical team and they are to slow respond, call back, or come to assess the patient, an RRT may be called with or without the sepsis team. The NSICU team assigned to the unit is available to all patients on the unit. However, their focus is on the intensive care unit patients. The attending team is responsible for the step-down patients, and they are the first call if a patient requires care on the unit's step-down. An earlier portion of the project discussed the EMR triggers that do not trigger on ICU patients because the expectation is that they are unstable. The step-down patients are not considered unstable; otherwise, they would still be on

the unit's ICU side, and they do trigger sepsis EMR alerts to the nursing staff. The unit's step-down hospital area that patients transfer to before transfer to the floor and then home. Activation of the RRT or sepsis team may be alerted to this patient population. However, the caveat is that the sepsis team can be activated to help nurses with patients in the ICU if the nursing staff appears to have issues getting the service team to respond to the triggered sepsis alerts. The nursing staff thinks the patient is becoming septic and needs to have treatment implemented within the first three hours of the IHI sepsis bundle to decrease septic shock.

The sepsis QI project's suggestion by a mentor who is a unit leader, and the unit sepsis champions are very enthusiastic and engaged in their roles as unit champions. There are minimal risks related to this project since the data is retroactive, and the investigator will not have direct contact with the patients for the information sought. The staff's increased knowledge of the sepsis triggers and what they mean in the timeframe suggested by the project will benefit patients who have trending data associated with possible sepsis. It is through collaboration with the medical team and nursing staff that this benefit will be possible. The medical team does not have the sepsis alerts embedded in their documentation screens, and they do not know when the triggers fire and do not know the length of time before the sepsis trigger alerts the nursing staff until they get the notification from the nurses. The increase in compliance reporting this project demonstrated a collaborative inter-team approach is necessary to assist with sepsis's life-threatening complications in the ICU.

Cost Factors

Budgetary Needs

This project initiation's cost factors were minimal. This project's budgetary needs were the meeting times given to the cost of human time paid to me for additional hours to meet with

individual nurses. The cost of sepsis and post sepsis care to patients continue to be a costly healthcare burden. The cost avoidance or savings associated with this project's implementation is insufficient to suggest putting forth a detailed budget. The project's cost included the student's overtime to complete the project with 1:1 nursing education and the time spent in committees to further the project's interest. The unit nurse's time was not included in the budget table because the education was done with the staff at the bedside so that they could continue to care for their patients and not be pulled off the floor for any extended timeframe, average time with each nurse was 15-20 minutes with real-time interactions if a sepsis alert was triggered during the education (see table 1).

Table 1

Project Budget Table

Table 1 Project Budget Table

Additional Hours of labor for Project FY 2019

Month $-Labor Material Meetings

	4- hour weekly education	Poster	Sepsis	Unit Practice Council
September	$318	$51.98	$30.75	$58.13
October	318		39.75	58.13
November	318		39.75	58.13
December	318		39.75	58.13
Total	$5,088	$51.98	$123	$232.52

Total Project Budget: $ _5,495.50_

Cost Avoidance or Savings Associated with Implementation

There was an attempt to get information from the institution from several sources, including the Chief Nurse, Response Team program coordinator, Bundles Payment Manager, and

the Coding Manager, to get questions answered related to sepsis at the institution. The questions attempted to get answers for included; the yearly cost of sepsis at the institution, how it is determined, and how sepsis (hospital-acquired) impacts hospital compare data and dollars for sepsis occurrences, but to no avail. According to Premier, a healthcare consulting company, more than 1.7 million adults in the United States are diagnosed with sepsis each year and 270,000 die as a result. The Centers for Disease Control and Prevention, notes sepsis costs hospitals more than $24 billion annually. Primer also noted most people who are diagnosed with sepsis come into the hospital with the diagnosis and cost approximately $22,000 to treat if not hospital acquired. This is believed to be because of early identification and treatment in the outpatient facilities and emergency rooms. From 2015 to 2018 the cost to treat hospital acquired sepsis rose from $58,000 per case to $70,000 per case of sepsis (healthcaredive.com, 2019). If we include the inflation for each year of approximately sepsis approximately 5% from 2015 to 2020; the proposed average cost of sepsis for inpatient encounters would be $74,024 per case for 2020 (see Table 2).

Table 2

Possible inflation of 5% for hospital-acquired infections from 2015-2020

2015	2016	2017	2018	2019	2020
	$58,000 x 0.05=2,900	$60,900 X 0.05=3,045	$63,945 x0.05=3,197.25	$67, 142.25 x 0.05=3,357	$70,499.36 x 0.05=3,524.97
$58, 000	$60, 900	$63,945	$67,142.25	$70,499.36	$74,024.33

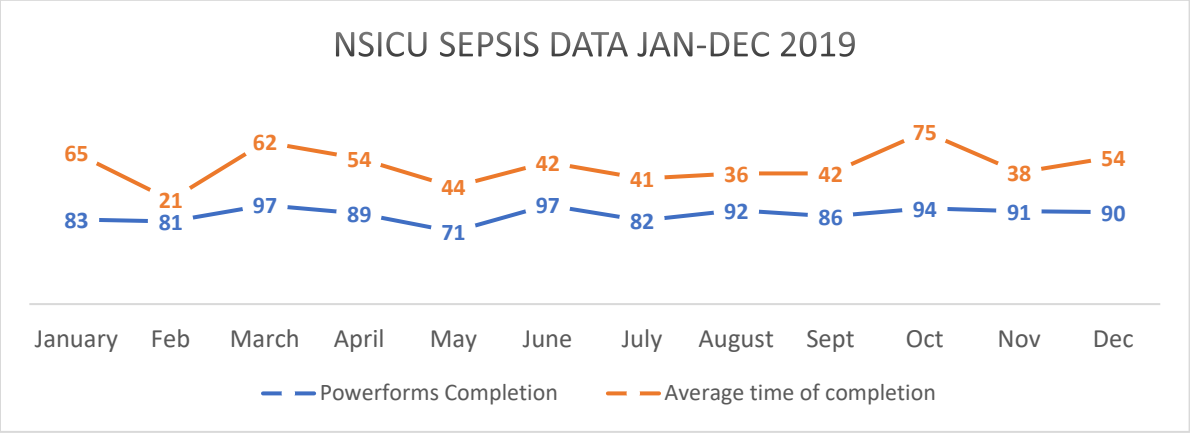
Chapter IV: Project Outcome Data

Analysis of the Implementation Process

A year before starting the sepsis QI project, the unit's sepsis compliance reporting was 64%, with an average reporting time > 2 hours. From September of 2018, two unit-based sepsis champions gleamed the data monthly and kept stats in a unit binder and sent out information to the staff of the past month's compliance. A standard email used to send to staff regarding compliance within the period of 60 minutes reporting in the unit practice council by the unit's sepsis champion to encourage staff who were reporting within the hour window. For the staff that did not meet the hour window's goal for reporting, a different email went out, reminding them of the unit's goal and an invitation to meet with the staff for any questions or process issues they did not understand. Each month from the beginning of the project, August to December 2019, there was some variance in the compliance of EMR triggered sepsis reporting, the number of power-forms filled out, and the timeframe of reporting to the medical staff (see Figure 3).

Figure 3

NSICU Sepsis Data



As displayed in Figure 3, the percentage of compliance for completing the power forms within one hour of EMR triggered sepsis events were compiled and analyzed for an increase in

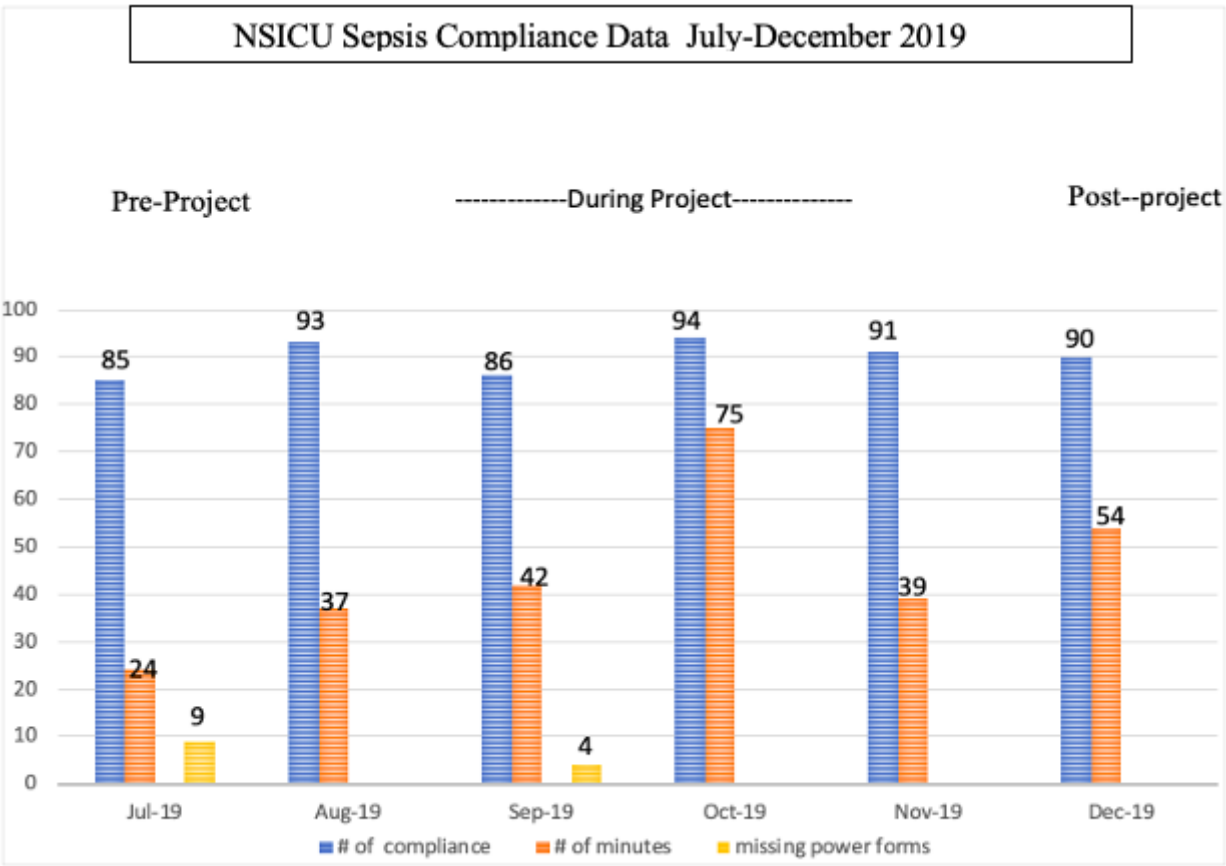
compliance because of the 1:1 nurse education. Each month the triggered power forms were tallied along with the timeframes to completion by the DNP student's mentor and the de-identified data was sent to the DNP student for the project. Qualitative Research methods used for this project included; direct interaction with individuals on a one to one basis, retrospective and real-time chart reviews, observations of nurses on all shifts, shifts during sepsis alert firing, direct communication with nursing staff on days, evenings, nights and weekends, after the intervention was applied which helped to determine the degree of success of the QI project.

Analysis of Project Outcome Data

The DNP project's goal was to provide 1:1 nurse education was to increase nurse reporting compliance to 90 percent of EMR sepsis triggered alerts to the medical staff within a 60-minute timeframe to decrease patient mortality and improve outcomes in the NSICU. At the end of the four-month DNP QI project, all 75 nurses received the compliance at 90%, with an average compliance time of 54 minutes (see Appendix B). The 90% increase in compliance reporting (see Appendix C) was achieved by completing 1:1 nurse education to all staff on the unit (n=75) regardless of FTE status. In January of 2019 the average compliance reporting was 83% with an average tie of completion of 65 minutes and had a lower dip in compliance in May of 71 % completion and just prior to the beginning of the project the completion compliance percentage was only 82%. The first month of the project the compliance rose to 86% with the final compliance of 90% and the compliance time went from 75 minutes to 54 minutes at the end of the project. The below figure represents the project reaching the benchmark goal of compliance of for the project at completion, 90% compliance of reporting sepsis alerts to the medical staff. The timeframe compliance of 54 minutes, the benchmark goal was to report in less than 60 minutes, was met at the end of the project as well (see figure 4).

Figure 4

NSICU Sepsis Compliance Data



Chapter V: Discussion

Summary of Major Findings and Outcomes

The significant findings discovered during the project were that the physicians, nurse practitioners, and physician's assistants were not getting the sepsis alerts. The medical team was educated along with the nursing staff when the project began. As mentioned in the method section it was discovered the medical team does not get the sepsis alerts and education was provided by the PA on the project team. Many of the medical staff did not know what to expect and did not know what interventions were needed to be in place for the patient's safety, such as bolus IV fluids, draw lactate level, start antibiotics if lactate was greater than 2 and start

anntihypotensive drugs, they were under the impression that it was just a notification from the nurses to make them aware of a potential issue, and the medical team did not think there was any other needed action on their end. Before starting the project, the nursing staff was not getting any orders to draw lactate lab levels. The sepsis committee chair worked with administration and the IT director to have the lactate lab label automatically prints once a sepsis trigger is triggered in the EMR for the patient. The staff is aware that the physician is still to be called or paged, and the PowerForm is to be filled out in the computer, with the lactate label now automatically printed and the label to be drawn. The automatic lactate draw is beneficial because if the physician does not return the page or phone call, the lactate lab will be drawn regardless of when they return the call. As a result of the four-month project, sepsis education, and an increase in phone call notifications, the medical team has become more receptive and understand their role, in the process. As result of the increased communication and education there is more of a dialogue with the nursing staff regarding the patient's condition and lab results during the bedside collaborative rounds.

Deviations from the original plan

A deviation from the project plan was the change in the stepdown report and lab values. This project's plan stems from the decreased compliance reporting of the sepsis alerts triggered in the EMR. Education is essential in real-time sepsis reporting to decrease the cascade of sepsis and, in the process. Sepsis, defined as a potentially life-threatening condition caused by the body's response to a stress. I completed a PowerPoint presentation for the staff meetings on the project and sepsis, but I could not present due to no meetings held in person with large groups due to the COVID-19 pandemic, which restructured the staff meetings to virtual meetings. As part of the sustainability of the project, I will present the PowerPoint slides in a meeting once we

start back with in-person meetings, and I plan to meet with the nurse interns on the unit in a set time during their education on the unit to continue 1:1 nurse education with the EMR notifications and expectations. Unfortunately, a 30-minute meeting with the new nurse cohort did not happen due to the COVID-19 pandemic and the shift in education strategies on the unit, but that too can be accomplished as part of the sustainability of the project. As part of the hospital sepsis champion team, I would eventually like to give a presentation to the entire new nurses in the facility during their orientation and allow them time to learn about sepsis, the hospital's goals of sepsis compliance.

Limitations to the project plan

I believe I could have had a much more effective outcome if the project was longer than four months. Six months would have been a better strategy to educate, and it would have given more time to assist the medical staff and show them the screen that the nurse sees when a trigger was fired. Time was too short and schedules of the people I wanted to sit down with or spend time with to understand all the organization's moving parts and the sepsis data that is tracked and disseminated to other members in the executive suite. Education of all the staff was a little challenging, and those who had no allegiance to the unit were not quick to buy into the education as beneficial to them. Some limitations to the project were the timeframes of educating all the staff. My original goal was to educate 100% of the staff, unable to fulfill this due to matriculation of the unit, different shifts, and FTEs that were PRN that I never saw. I did change my schedule to make sure ai was available during the day, evening, and night shift to educating, and this was very pivotal in the educational process because it allowed me to interact with staff that I do not usually get the opportunity to do so. During the project, I worked either 11 am-7 pm or 3 pm-11 pm on weekdays and weekends to allow me access to as many staff as possible to

educate 1:1. I kept a list of all staff members (provided to me by the nurse manager) and checked off all the staff as I educated and in the process, the staff that I rarely saw I was able to come in on my days off or switch shifts or stay over after my shift ended to educate. Office time was generously given in time in 4-hour blocks to educate staff either before my shift or after my shift to not interrupt during the educational process. The final limitation to the project was the transition of staff members of my team. The PA switched position onto another unit and one of the sepsis champions took a travel assignment which left two unit champions available to carry on the sepsis compliance audits monthly and with covid-19 it has been difficult to get scheduled time to be consistent with the chart reviews.

Implications for the organization including sustainability

Sustainability should be smooth and very practical if the education could continue with inexperienced staff and have the sepsis champions available for nurse education. One of the sepsis champions is on the night shift, and one is on dayshift, which would make it easier to educate. An idea for the future stainability would be to have subject matter experts (SMEs) to be available for sepsis education would benefit the staff. As a member of the unit and hospital sepsis committee, it should not be challenging to keep the staff engaged and continue to work with the medical staff with the meaning of the triggers and their responsibility. July 1st of every year is when new residents come on board, and this would be easy to meet with them and explain the triggers and what they are expected to know and do to keep our patients safe. Working with the facility educators to provide sepsis training through annual education in the computer system would be one way to make sure the staff has a refresher every year if it was made part of annual training.

My mentor assisted me in creating a dashboard that allowed me to track the unit's compliance each month and allows yearly reporting of the reports to be available to the staff for compliance. The sustainability of the project is discussed at the monthly unit practice council where there were discussions of practice issues and suggestions regarding the sepsis triggers and reporting issues and what we as a team could do to increase compliance, this keeps the compliance relevant to the staff. As a member of the hospital sepsis committee, it was vital for me to attend meetings and return to the unit with information disseminated monthly via emails with sepsis practice changes and hospital coming events of sepsis education. A current rounding sheet was updated to include any sepsis alerts fired on a patient within 24 hours that needed to be discussed during physician rounds. This was done to alert the staff that we may have a potential issue and to assist in watching for trends in vital signs and WBCs elevation over the 24-hour period, most labs are only done once a day unless warranted. If the WBCs are trending up and the patient's vital signs become unstable the nursing and medical staff need to keep a watchful eye on the patient.

Implications for Practice Change

Some nurses have been on the unit for a while and have experienced a great deal of change and to have someone who is attempting to hold them to the standards that have been set forth by the facility seemed like another 'thing they are trying to make us do, and nursing is hard enough without doing extra work for the physicians". The nurses feel the physicians should be responsible for seeing the sepsis triggers and ordering the necessary interventions without the page or phone call from the staff. It was explained to the staff why the medical team does not see the triggers because it would be like the nurses seeing all the triggers on the patients on the unit and it would not be a desirable work flow for them as it is currently not for the physicians.

Because the medical personnel cannot see the triggered alerts it causes the nursing staff to pause what they were doing, acknowledge the alert, access the patient, document in the EMR if the trigger is correct and then to page or call the medical staff to report the trigger. This requires the nurse to report the information of the vital signs, white blood cell count trend and the patient's overall condition at the time of the trigger, all of which they don't think they have the time to do so all while caring for their assigned patients. After explaining that they may have saved a life in reporting, the sepsis enhanced education of the triggers and information of the nurse inspired change in practice of the lactate lab label printing was a little easier to accept. I also believe if the education is made personal, it makes people realize it could be them or anyone of their family members and having a nurse who does the right thing and following protocol is invaluable when it comes to saving lives. The quality improvement project's impact was to increase compliance in reporting of sepsis alerts to the medical team through 1:1 nurse-driven education. Applying the DNP essentials to the project levels voided some of the elements meant to focus on critical areas of the project. Through the relationship with the project site, I would like to see this project continued all units to help decrease sepsis mortality in the facility.

Future Research

Helms and Perner (2020) notes, globally, there is extensive research conducted yearly and published articles on sepsis because it is still a major medical issue that causes millions of deaths. Although there continue to be many random clinical trials surrounding sepsis, it is an elusive syndrome, much like coronavirus. Until we can develop some early biomarkers or a screening tool, sepsis will continue to be one of the top 10 health care issues in and out of the hospital. This project would be easy to recreate and given more time, and it would probably yield the same results or better with more time. Prevention is the best solution to sepsis, and when

patients are hospitalized, the lactate blood test is the most reliable indicator that we currently must help diagnose sepsis when patients' vital signs are unstable. A recommendation would be within the framework of the organization's strategic plan through the use of the sepsis champions and the sepsis committee to use this project plan from unit to unit through education and dissemination of the project with help from the sepsis champion that each unit sends to the hospital-wide monthly committee meetings. The committee member would be the facilitator on each unit and would facilitate 1:1 nurse education for new employees and some staff that desire reeducation so that every nurse in the facility is confident in their reporting and compliance with the facility's sepsis protocol. Vizient .com (2020) notes, Patient Family Advisory Councils would be an essential resource to increase public awareness and patient education. I agree that this would be a worthwhile endeavor for the organization to continue to address and adhere to sepsis issues in the hospital and the communities that the organization serves. It is more evident now than ever, considering the current state of the covid-19 pandemic that we are currently experiencing. Sepsis education needs to be addressed in communities to assist in the warning signs to report to medical personnel and address when people need to seek medical treatment in hospitals to help save lives.

Significance to Nursing

Nurses are the staff that spends the most time with patients during their hospitalization, and patients rely on them to keep the patients safe. Intensive care unit nurses can easily spot patient conditions changes because they see them hourly while in the unit. On the NSICU unit the ICU nurses also care for the step-down patients. As stated above in the *setting* portion of the paper, the NSICU has three dedicated beds on the ICUs that are for stepdown-beds. Along with the EMR triggers embedded to alert the staff of changes in the patient's condition, improving

sepsis on the unit will improve and is significant to nurses in that it will assist in capturing any sepsis alerts triggered overnight. To help with improving the process for nurses, the stepdown collaborative rounding sheet was retooled to include the question of *any triggered sepsis alerts* overnight so the team can address them on rounds the following morning and any interventions that were done. Vizientinc.com (2020) notes that Patient Family Advisory Councils would be an essential resource to increase public awareness and patient education. I agree that this would be a worthwhile endeavor for the organization to continue to address and adhere to sepsis issues in the hospital and the communities that the organization serves. A nurse reported back to me that she had an off-service patient, that she had to explain to the medical staff the importance of why she was calling to report the sepsis trigger and what it could mean to the patient's outcome if not treated. That was a very satisfying moment during the implementation of the project. I encountered nurses who wanted to ask questions about sepsis but were unsure whom to ask and didn't want to feel embarrassed about not knowing what the correct reporting looked like. They were incredibly grateful for the 1:1 education and felt more empowered to call the attending physician and report if they were not getting the call backs from the residents or satisfactory medical treatments when they reported the alerts.

Health Policy

Sepsis is responsible for nearly one-quarter of a million lives, the elderly and those with underlying issues are the most at risk. In Virginia, 34 hospitals and 38 nursing homes hospitals have partnered with Health Quality Innovators (HQI) and the Virginia Hospital & Healthcare Association to ease sepsis admission burden in local hospitals. The initiative educates patients and families to recognize possible sepsis and speak up if they think they have symptoms, educating and training staff in nursing homes and veteran homes and hospitals to seek immediate

medical attention for patients if sepsis is suspected. This initiative is also better educating the emergency room staff to draw lactate levels and start antibiotics immediately if they suspect someone has sepsis. The initiative is also attempting to improve collaborative communication between hospitals and nursing homes by meeting in person and discussing facility and community issues surrounding sepsis to improve transfers between facilities when needed. Thus far, this initiative has prevented 123 hospital admissions, and over 342 deaths, while saving health, are dollars of up to 4.8 million (hqisolutions.com, 2020). These are ideal initiatives that can slow sepsis rates and prevent deaths through education.

Relevant Health Care Policy or Regulatory Issues Related to the Project

The international Surviving the Sepsis Campaign, a joint initiative of the Society of Critical Care Medicine and the European Society of Intensive Care Medicine, is committed to reducing mortality and morbidity from sepsis and septic shock worldwide. This project looked at the timeframe compliance from sepsis triggers to reporting to the medical staff to curtail sepsis in the ICU patient population. This project is in line with the global initiative for sepsis and the recognition that sepsis is the leading cause of death worldwide, with the goal of multidisciplinary, international experts committed to improving time to recognize and treat sepsis and septic shock. There are many opportunities for policy development or reform on the unit, system, regional, and national levels appropriate from this sepsis project.

Chapter VI: Conclusion

The Value of the Project to Health Care and Practice

Sepsis identification and initial treatment are imperative to patient survival. A knowledgeable medical team is the best chance a patient has of surviving sepsis if the team can recognize, intervene, and treat within the three golden hours. This project's value has far-

reaching implications in the health care field and the public health departments throughout local and state governments. Patients who are admitted and die from COVID-19 related to overwhelming sepsis infections have a better chance of survival as the medical community continues to determine how to treat this patient population best, they do have one weapon in their arsenal; they know how to treat sepsis. Throughout this paper, we have learned the treatment for sepsis, which includes: IV fluids, appropriate antibiotics, and supportive care of the involved organ (sepsis.org, 2020). Sepsis education is an ongoing part of the practice, no matter what nursing area I am involved in, pursuing other nursing avenues as an advanced practice nurse. Valuable lessons learned from this project was through the formal education with staff and the information for students, patients, and families through the sepsis poster that I hope will help to increase sepsis awareness . Like sepsis, the coronavirus effects are seen globally and have been around since the 1960s. The effects of the virus on organs and causing sepsis/septic shock were unknown until it reached the pandemic state (clevelandclinic.org, 2020), and more cases reviewed included organ failure. Sepsis can result from any viral infection, including the flu or COVID-19, leading to severe illness, septic shock, and even death (sepsis.org, 2020). Through early recognition, increased compliance of timely reporting, we may be been able to decrease the number of sepsis mortality cases on the unit and potentially keep patient from returning to the unit after a transfer.

DNP Essentials

All eight of the DNP essentials were addressed in this project. The DNP essentials as published by the American Association of Colleges of Nurses (2006) describe the essential criteria DNP education should meet (AACN, 2006).

Essential I. *Scientific underpinnings of practice* was carried out through the professional growth of research and seeking out information from the organizations, professional contacts, committees, and knowledge learned through joining the sepsis committee. This QI project has made me the subject matter expert on the unit. I created a unit-specific power-point presentation for the medical facility on the share-point site that describes some conditions the neuroscience patient population and, that falsely triggered the EMR alert. An example of this is the patient who has seizures; vital signs will trigger a warning through an elevated heart rate, decreased oxygen demand, decreased respiratory rate. The sepsis poster displayed in the unit's step-down area in the hallway will continually educate patients, families, and staff.

Essential II. *Organizational and systems leadership for quality improvement and systems thinking,* impacted the QI project through the advanced communication skills required to teach each staff member the correct way to use the EMR alerts. I communicated with the interprofessional team regarding the project and their expectations when the nursing staff reports sepsis trigger. This essential was satisfied through the processes used to lead quality improvements and patient safety with sepsis education, which was the cornerstone of my project. This project will help the unit, patients, and families identify what we can do to impact the reduction of sepsis on the unit.

Essential III. *Clinical scholarship, and analytical methods for evidence-based practice* gave me the opportunity to focus more on my role of collaborating with others within the organization who are SMEs and those who can mentor my efforts to educate. Working with others can also offer a platform for me to disseminate information on the facility's share-point website for my sepsis QI project to assist in the ICU nurse's growth. The use of analytical methods in research articles was used to critically appraise existing literature and other already established evidence

of sepsis in the organization to determine and implement the best evidence for the unit's practice. A dashboard was designed and implemented into practice to evaluate the outcomes of the project on current practice, practice patterns, and systems of care within the NSICU, the health care organization, and in the community against national benchmarks to determine variances in practice outcomes and population trends.

Educating families who visit their loved ones in the NSICU is ongoing and for those patients who have tested positive for coronavirus and are going home, they are educated on the safe practices in accordance with the CDC guidelines. I have used the EMR system and research methods applied to the project to appropriately; collect accurate data to generate evidence for nursing practice through retroactive chart reviews of the triggered alerts, inform and guide the design of databases that generate meaningful evidence for nursing practice through the dashboard that is shared with the staff monthly at the practice council meetings, analyze data from practice through the triggered EMR alerts, design evidence-based interventions through nurse education, predict and analyze outcomes through the redacted data from the monthly reports, examine patterns of behavior and outcomes through nurse education, identify gaps in evidence for practice through the unit compliance. Prior to the beginning of the QI project the nurse reporting compliance of the triggered alerts to the medical staff was only 64%. The hospital benchmark is 90% monthly compliance which is in line with the national benchmark.

Essential IV. *Information systems/technology and patient care technology for the improvement and transformation of health care.* I learned to create a monthly dashboard to use for the unit’s monthly sepsis compliance reporting to display data in an easily readable, color chart format during monthly team meetings. Through this QI project I have learned to dissect data in the EMR related to the triggered sepsis alerts. I also had a telephone meeting with the IT

manager regarding what could be imbedded into the system and to try to understand what system we were using in the facility and why. The hospital is using the St. John's alerting system

Essential V. *Health care policy for advocacy in health care* has broadened others' education through the QI project, especially at the unit and facility level. I have not had the opportunity to opportunity to influence policymakers on any scale yet. Through the 1:1 education project, report to the medical staff to intervene on the patent's behalf if the triggered data is truly sepsis related to helping save lives. As a member of the hospital-wide sepsis committee, we have changed hospital policy for the way the lactate labs are now drawn. Information was brought back to the committee from several units and the issue of the physician's slow response time to the reported alerts was outside of the three-hour window, and lactate levels were not being drawn, or physicians were returning calls and declining to draw the necessary lactate labs. The chair of the committee and the hospital administrator was able to work with the IT department to change the policy of how the lactate labs were to be drawn. The new policy is that when a sepsis alert has been triggered, and the nurse has verified the patient outliers, the lactate lab is automatically printed out, and the nurse can draw the lactate lab without the physician's order to do so. Through the QI project the unit practice was changed to report out the monthly dashboard sepsis compliance.

Essential VI. *Interprofessional collaboration for improving patient and population health outcomes* required that I communicate more often with the nursing staff and the medical team regarding the project if we wanted to achieve and maintain 90% compliance of reporting within the project's four months. The step-down rounding sheet was retooled to include a question of a sepsis alert fired overnight and if the answer is yes, it forces the collaborative rounding team to address the trigger and examine the patient's latest lab results and address the

patient's current condition and to ask the question of what was done overnight as a result of the trigger reported.

Essential VII. *Clinical prevention and population health for improving the nation's health,* assists me to advance this project on the local level by the use of a poster presentation and education at the community through educational opportunities at work, churches, local and national health fairs. The hospital where the QI project was carried out had scheduled a day of poster presentation by the sepsis committee in the lobby of the facility that was to be open to staff and visitors where information was given with pamphlets and through a verbal education session. The hospital-wide sepsis team wanted to do a roving cart with a wheel that spends and when answering the sepsis related question (right or wrong) the recipient would get a prize for getting the question correct and a piece of candy, if they get the question wrong they would be given the correct answer and have the opportunity to learn through playing the game. This proposed game would be open for both staff and visitors. Unfortunately, the coronovirus caused this to be suspended this year, hopefully we can do it next year. I am also a member of the Caribbean American Providers Practicing Abroad; it is a collaborative health sciences group that travels once a year to an island in the Caribbean to address the most significant needs of each island. Each year the organization has a week-long conference and community health fair in the Caribbean. There are always multiple avenues for education while attending this yearly conference, including speaking, break sessions with other professionals on a panel with related subjects, poster board, with Q & A sessions during the breaks of other sessions during the conference. I am also a member of four nursing organizations, chi eta phi nursing sorority, Sigma Theta Tau, American Nursing Association, and American Association of Critical Care Nurses and can submit an abstract or poster on sepsis information sharing on the local and national level.

Essentials VIII. *Advanced Nursing Practice* has been evaluated and carried out through the project's design while mentoring an experienced nurse and creating an educational opportunity for novice nurses as they transition onto the unit. The IRB approval from Bradley also satisfies this essential in addition to my upcoming graduation from Family Nurse Practitioner school, where I will educate many family and patients and their families in my new during patient visits and consultations before and after visits if patients or families call into my practice with questions related to preventable sepsis infectious.

Plan for Dissemination

Plans for disseminating the project include poster presentations on the local, city, and national level when the opportunity presents. The DNP student will apply to different abstract sessions and hospital education sessions to disseminate the project. As a member of Chi Eta Phi, the nursing sorority's graduate education chapter, we participate in the community's educational opportunities all year round, we meet monthly to discuss health issues and opportunities particular to the African American community and involve ourselves in education the community with some of the greatest needs to include, lower socioeconomic populations, prison ministries, and at risk populations. Chi Eta Phi, incorporated, is a professional organization for registered nurses and undergraduate nursing students (both male and female) represented by many cultures and diverse backgrounds. There are over 41 active undergraduate chapters and 101 graduate chapters located in 33 states, District of Columbia, St. Thomas U.S. Virgin Islands, and West Africa. Membership is by invitation only and is both active and honorary with lifetime membership. On the local and national levels, the Northeast Region of Chi Eta Phi has conferences yearly on the east coast. Additionally, the entire sorority (8,000 members throughout the United Sates, Virgin Island, and West Africa) meets biannually at a designated place that has

an active chapter for all members (chietaphi.com,2020). We can submit abstracts for education and present to the group during educational or leadership seminars which are viewed by the members and families who attend the events we host.

I am also a member of Sigma Theta Tau, the honor nursing society and as a member there are many opportunities for abstracts and poster presentations available. There will be a poster in the unit on the unit's step-downside for staff, patients, and families to see and stay educated on the sepsis challenge. The percentage of compliance will be reported each month through the unit practice council via the dashboard. Sepsis information disseminated to the staff from the hospital committee to the unit committee. The hospital share site will have unit-specific sepsis information available for any staff who wants to view different units and their sepsis outliers due to the patient population that they serve. The doctoral project, the paper will be submitted to a national database to be viewed by any doctoral student who is looking for information on sepsis. I will present a presentation of the project results to the staff at a staff meeting post-graduation and will be working with new nurses assigned to the unit when they are on orientation to educate them on the sepsis alerts compliance. There will be monthly data mining of the triggers and the unit sepsis champions, to include myself, will send individual emails to the nurse regarding their outlying timeliness of the trigger responses and gently reminding them of the hospital's goal of 90%. I will report the unit's current percentage rate of compliance now and inquire how the nurse (the subject of the email) can help the unit maintain the goal. Lastly, my mentor submitted a write up of my sepsis project as part of the Beacon award for stroke centers to the credentialing body as part of the organizational packet (see Appendix M). This is another way to disseminate the sepsis project on a national level.

Attainment of Personal and Professional Goals.

As a DNP scholar, I have learned to work with diverse groups and have gained greater insight into sepsis and septic shock. I will have attained my personal goal of obtaining my DNP as a terminal degree. I was not sure what I wanted to do after I received my MSN degree in leadership. I felt like my education was not complete, and then I was made aware of the DNP degree as the terminal degree, which gives many employment options in different areas of nursing. The DNP degree enhances knowledge to improve nursing practice and patient outcomes; and enhanced leadership skills to strengthen practice and healthcare delivery (AACN, 2006 & Moran et al., 2017). These are some of the goals that I have obtained during the past year. I think I have obtained the education through this program for better leadership and want to impact medicine through my next career move as a DNP. I have the leadership skills, but the DNP adds the knowledge to improve practice for more excellent patient outcomes and decrease in mortality through research, QI projects, and nurse education.

References

American Association of College of Nurses (2006). *The Essentials of Doctorate Education for Advanced Nursing Practice.* https://www.aacnnursing.org/Education-Resources/AACN-Essentials

American Hospital Association (2018). *Sepsis mortality reduction*. http://www.hret-hiin.org/Resources/sepsis/18/sepsis-and-septic-shock-change-package.pdf

Amland, R. & Sutariya, B. (2017). *Saving lives through sepsis surveillance.* Cerner. https://www.cerner.com/perspectives/saving-lives-through-sepsis-surveillance/

Buchman, T., Simpson, S., Sciarretta, K., Finne, K., Sowers, N., Collier, M., Chavan, S., Oke, I., Pennini, M., Santhosh, A., Wax, M., Woodbury, R., Chu, S., Merkeley, T., Disbrow, G., Bright, R., MaCurdy, T. & Kelman, J. (2020). Sepsis Among Medicare Beneficiaries: 1. The Burdens of Sepsis, 2012–2018*, *Critical Care Medicine 48(3)*, p 276-288. http://doi.org/10.1097/CCM.0000000000004224

Castelluci, M. (2017). Sepsis mortality rate on the rise. https://www.modernhealthcare.com/article/20170925/NEWS/170929930.

Chmielewski, N.A., Faulkner, L.D. & Drone, M. (2019). Using floor champions to improve sepsis quality outcomes in community hospitals. *Nurse Leader 17*(2), 51-154. https://doi.org/10.1016/j.mnl.2018.08.005

Clevelandclinic.org (2020). *Coronaviruses have been around for centuries: what differentiates COVID-19?* The Cleveland Clinic. https://consultqd.clevelandclinic.org/coronaviruses-have-been-around-for-centuries-what-differentiates-2019-ncov/

Cms.gov, (n.d.). *The HCAHPS Survey – Frequently Asked Questions.* https://www.cms.gov/medicare/quality-initiatives-patient-assessment-instruments/hospitalqualityinits/downloads/hospitalhcahpsfactsheet201007.pdf

Delaney, M. M., Friedman, M. I., Dolansky, M.A., & Fitzpatrick, J. J. (2015). Impact of a sepsis educational program on nurse competence. *The Journal of Continuing Education in Nursing* 46(4). https://doi.org/10.3928/00220124-20150320-03

Flinkman M., Leino-Kilpi, H., Numminen O., Jeon Y., Kuokkanen L. & Meretoja R. (2016). Nurse Competence Scale: a systematic and psychometric review. *Journal of Advanced Nursing, 73*(5). https://doi.org/10.1111/jan.13183

Hajj, J., Blaine, N., Salavaci, J., & Jacoby, D. (2018). The "centrality of sepsis": A Review on incidence, mortality, and cost of care. *Healthcare. 6*(3) 90. https://doi.org/10.3390/healthcare6030090

Helms, J. & Perner, A. (2020). Focus on Sepsis. *Intensive Care Medicine (2020) 46:*1457–1459 https://doi.org/10.1007/s00134-020-06038-x

hqisolutions.com (2020). *Stopping sepsis: Virginia initiative saves lives, reduces hospital stays.* https://www.hqi.solutions/news/stopping-sepsisvirginiainitiativesaves-lives-reduces-hospital-stays/

Kleinpell R. (2017). Promoting early identification of sepsis in hospitalized patients with nurse-led protocols. *Journal of Critical Care* 21(1), 10. https://doi.org/10.1186/s13054-016-1590-0

Leisman, D. E., Doerfler, M. E., Ward, M. F., Masick, K. D., Wie ,B. J., Gribben, J. L., Hamilton, E., Klein, Z., Bianculli, A. R., Akerman, M. B., D'Angelo, J. K. & D'Amore, J. A. (2017). Survival benefit and cost savings from compliance with a simplified 3-hour

sepsis bundle in a series of prospective, multisite, observational cohorts. *Critical Care Medicine*, *45*(3) 395-406. https://doi.org/ 10.1097/CCM.0000000000002184

Mayr, F. B., Talisa, V. B., Balakumar, V., Chang, C. H., Fine, M. & Yende, S. (2017). Proportion and cost of unplanned 30-day readmissions after sepsis compared with other medical conditions. *Journal of the American Medical Association*, *317*(5) 530-531. https://doi.org/10.1001/jama.2016.20468

Moran, K. J., Burson, K. & Conrad, D. (2017). *The Doctor of Nursing Practice Scholarly Project.* Jones & Bartlett.

Moore, W. R., Vermuelen, A., Taylor, R., Kihara, D. & Wahome, E. (2019). Improving 3-Hour sepsis bundled care outcomes: implementation of a nurse-driven sepsis protocol in the emergency department. *Journal of Emergency Nursing 45*(6), 690-698. https://doi.org/10.1016/j.jen.2019.05.005

Mutual Medical Insurance Company (2019). *Sepsis: A Medical Emergency*. Mutual Medical Insurance Company of Maine. https://www.medicalmutual.com/news/article/sepsis-a-medical-emergency/357

Pruinelli, L., Westra, B.L., Yadav, P., Hoff, A., Steinbach, M., Kumar, V., Delaney, C.W. & Simon, G. (2018). Delay within the 3-hour surviving sepsis campaign guideline on mortality for patients with severe sepsis and septic shock. *Critical Care Medicine, 46*(4):500-505. https://doi.org/10.1097/CCM.0000000000002949

Rudd, K. E., Seymour, C. W., Aluisio, A. R., Augustine, M. E., Bagenda, D. S., Beane, A., Byiringiro, J. C., Chang, C. H., Colas, L. N., Day, N. P., DeSilva, A. P., Dondorp, A. M., Dünser, M. W., Faiz, M. A., Grant, D. S., Haniffa, R., Van Hao, N., Kennedy, J. N., Levine, A. C., ... Angus, D.C. (2018). Association of the Quick Sequential (Sepsis-

Related) Organ Failure Assessment (qSOFA) score with excess hospital mortality in adults with suspected infection in low- and middle-income countries. *Journal of the American Medical Association, 319*(21), 2202–2211. https://doi.org/10.1001/jama.2018.6229

Saito, H., Tmurkaynak, F., Borzykowski, T., Kilpatrick, C., Pires, D., Allegranzi, B. & Pittet, D. (2018). "It's your hands-prevent sepsis in healthcare", World Health Organization (WHO) SAVE LIVES: Clean Your Hands campaign. *American Journal of Infection Control*, 31(1), 2-3. https://doi.org/10.5152/kd.2018.03

Scoligard, E. (2016). Early identification of sepsis in hospital inpatients by ward nurses increases 30-day survival. *Critical Care, 20*(244). https://doi.org/10.1186/s13054-016-1423-1

Sepsis Alliance (2020a). *The connection between covid-19, sepsis, and sepsis survivors.* https://www.sepsis.org/news/the-connection-between-covid-19-sepsis-and-sepsis-survivors/

Sepsis Alliance (2020b). *Post Sepsis Syndrome.* https://www.sepsis.org/sepsisbasics/post-sepsis-syndrome/

Sterling, S. A., Miller, W. R., Pryor, J., Puskarich, M. A., & Jones, A. E. (2015). The impact of timing of antibiotics on outcomes in severe sepsis and septic shock: A systematic review and meta-analysis. *Critical Care Medicine,* 43(9),1907-1915. http://doi.org/10.1097/CCM.0000000000001142

Tiru, B., DiNino, E. K., Orenstein, A., Mailloux, P. T., Pesaturo, A., Gupta, A., & McGee, W. T. (2015). The Economic and humanistic burden of severe sepsis. *PharmacoEconomics* 33, 925. https://doi.org/10.1007/s40273-015-0282-y

usnews.com (2018). VCU Medical Center. https://health.usnews.com/best-hospitals/area/va/virginia-commonwealth-university-medical-center-6340860

Vizientinc.com (2020). *Sepsis Early Recognition Collaborative 2019-2020*. https://www.vizientinc.com/my-dashboard/my-collaboratives/sepsis-earrecognition collaborative-2019-2020.

Wheeler D. S. (2015). Is the "golden age" of the "golden hour" in sepsis over? *Critical care 19*(447). https://doi.org/10.1186/s13054-015-1167-3

www.mayoclinic.org (2018). *Sepsis*. Mayo Clinic. https://www.mayoclinic.org/diseases-conditions/sepsis/symptoms-causes/syc-20351214

Yousefi, H., Nahidian, M. & Sabouhi, F. (2012). Reviewing the effects of an educational program about sepsis care on knowledge, attitude, and practice of nurses in intensive care units. *Iran Journal of Nurse Midwifery Research*, 17(2Suppl1), S91-S95. http://www.ijnmrjournal.net/

Zhao, J., He, Y., Xu, P., Liu, J., Ye, S., & Cao, Y. (2020). Serum ammonia levels on admission or predicting sepsis patient mortality at D28 in the emergency department: A 2-center retrospective study. *Medicine, 99*(11), e19477. https://doi.org/10.1097/MD.0000000000019477

Zink, J.A. (2018). *Reducing Sepsis Mortality: A Cloud-Based Alert Approach*. [Doctoral Dissertation, Virginia Commonwealth University]. https://scholarscompass.vcu.edu/cgi/viewcontent.cgi?article=6786&context=etd

Appendix A

Patient case study for the basis of the student's QI Project

8/17/18: A 73-year-old male with a history of HTN, A-fib on Xarelto, CVD, and previous CVA that left him with right sided deficits. Admitted to facility after being found unresponsive at home by family and showing right sided hemiparesis and aphasia. CT was obtained in the ED and showed a Large Left sided Basil Ganglia Inter Cerebral Hemorrhage. Significant Labs on Admission: WBCs 5.7 Crit 1.25 BUN 10. VS on arrival to the ED @ 1000: HR 75 BP 204/155 (143) RR 18 SpO2 97% RA Temp 37.4. VS on admission to the NSICU @1200: HR 81 BP 183/65 (94) (on nicardipine) RR 15 SpO2 96% RA Temp 37.6. First set of cultures drawn 8/17/18 @ 1600 and CXR ordered for Temp 38.5 and copious amounts of sputum. Pt started on Zosyn. Tmax 38.7 overnight HR high 80s to mid 90s RR 20-27 with + neuro change and lethargy. Clevidipine gtt turned off overnight and BP sustained in the 110s/50s. 3am labs WBCs 6.0. Day Tmax of 39.5 and pt requiring 2L NC. HR steadily increasing from low 90s to low 110s. SBP 140-160s responding to antihypertensive. Pt started on Vanc.

8/19/18: Tmax 39.1 PRN Tylenol given Weaned to RA sating mid 90s, RR 20s, HR consistently in the 110s. Pt remained hypertensive over-night but responded to labetalol and IV metoprolol. 3am labs WBCs 7.7

8/20: HTN persisted, RR increased to 20s to 30s, Tmax 38. PRN Tylenol given. Pt still drowsy but back to following commands. WBCs 5.0 Vanc Stopped.

8/21: 1st sepsis alert fired at 0821 for HR 116 BP 144/82 (101) RR 22 SpO2 98 on 2L 3am Labs WBCs 5.4 --- Sepsis alert fired but form was never filled out. No follow up. Pt on RA by 1600, BP normalized into the 130s and HR back to the low 100s.

By 8/23 @ 0200 pt was back on 2L NC with a RR in the low 40s and a Tmax of 39.4. No alert fired. RN requested pan cultures. Vanc Started again. WBCs 10.3

8/23: 2nd Sepsis Alert fired at 1608 HR 102, RR 30, Temp 38.9, BC ordered (BP 133/84 (97)) (not filled out by dayshift RN who triggered the alert but by the night shift RN at 2000 when BP was 106/53(67) HR 82 RR 34 and Temp 38.5)

8/24: Persistent tachypnea overnight. MD paged and made aware after RR consistently above 30 for 8 consecutive hrs. No plan per MD. Pt placed on Face tent at 0400. Tmax 38.5 pt given PRN Tylenol. SBPs in the 110s HR 80s-120s WBCs 8.8

8/25: 3rd sepsis alert fires @ 2019 Temp 39.4 (no Tylenol in 24 hours) RR 53 BP 122/62 (80) HR 116 WBCs 9.1 from 0300 labs. Blood cultures ordered. No growth in any of the cultures to date. ***Reminder pt has been on zosyn since admission and on and off vanc since the 18th***

8/26: 4th sepsis alert fired @ 155 for HR 114 RR 26 (RN charted in the alert that the VS were charted incorrectly) RR persisted above 30 on RA. At 8am Primary team increased LOC for increased respiratory efforts and change in neuro status (pt became obtunded) WBCs 11.8

8/27: ICU team caring for pt, consulted ID, T max 39.2 another set of cultures are sent (last of 5 rounds none of which showed growth on anything except the respiratory culture on 8/19 which showed mixed respiratory flora) WBCs 8.4

8/28: pt. intubated for work of breathing with accessory muscles (face tent at 10L) and RR in the 30s, BPs soft (below 110s) pt back on vanc and still on zosyn. WBCs 7.5

8/29: Pressure in the 90s-70s, 500mL boluses (x2) given for BPs in the 80 and pt started on norepi by 8am.

8/30: DNR status discussed with daughter. Poor pt prognosis at this point.

9/1: Pt received palliative orders and was terminally extubated

9/3 patient sent to an inpatient hospice unit

9/7: Pt dies

Take-aways from this case study

- Every alert for this patient had HR and RR as the SIRS criteria and with the change in systolic BP >40, the organs involved were the kidneys and lungs. Next he was started on Zosyn for supposed community aspiration on initial admission, this masked the infection and dampened the WBCs and probably contributed to the lack of growth from the blood cultures
- The Pt had a change in cognitive on 8/20 which was most likely not picked up by the staff in the NSICU. A change in mentation without a neuro reason can often mean sepsis. That is why the **Sepsis** alerts are so important to review and to have 100% compliance with reporting to the medical staff.
- In the end it appears this man was aspirating, and the big issue was that the lactate was never drawn, he seemed to maintain his BP but pulmonary was wearing out. People don't breathe in the 30's for no reason. He finally just tired out. So those alerts were telling a story.

Appendix B

Retroactive Chart Reviews by Unit Sepsis Champions

Staff Name (deleted for project)	Date of chart Review								RETROACTIVE CHART REVIEW SHEET
	8/28/18								
	12/18/18								
	2/24/19								
	10/7/18								
	1/27/19								
	8/22/18	9/12/18	9/23/18	11/19/18	3/19/19	3/21/19	3/21/19	3/3/19	
	8/13/18	8/30/18	8/31/18	9/9/18					
	2/26/19								
	Educated 1:1	Email sent	Missing form	Over an hr					
	8/11/18								
	1/8/19								
	11/18/18	2/8/19	3/15/19						
	8/7/18	8/7/18	10/23/18						
	9/19/18								
	9/6/18								
	10/14/18	10/28/18							
	12/4/18	12/17/18	2/18/19	2/18/19	3/11/19				
	1/24/19								
	1/9/19								Legend Code
	8/10/18								
	1/6/19	1/26/19							Blue (form correctly filled out and MD call)
	11/21/18								
	12/1/18	12/6/18							Pink (sent a standard letter)
	10/26/18	11/16/18	12/7/18						
	8/31/18	8/19/18	9/10/18	9/10/18					Red (form not filled out within 60 minutes / OR MD not called
	8/16/18								
	8/31/18	9/8/18							
	9/7/18	1/4/19							Yellow (educated staff 1:1
	8/25/18	8/29/18	9/12/18	11/28/18					
	8/13/18								

Appendix C

Standard Staff Form Letter for Noncompliance to Sepsis Alerts

Letter #1

You are receiving this email because in January you had a SEPSIS alert fire on one of your patient's and the form was not filled out.

On 1/4/2019 _____ had an alert fire. Please make sure to fill out the sepsis PowerForm that pops up in care compass as soon as possible.

The national sepsis guidelines allow for 1 hour to start interventions if sepsis is suspected. Please make sure to call or page the primary provider and let them know why the alert fired and ask for recommendations on how they would like to proceed with the sepsis alert.

If sepsis is not suspected that is okay but you still have to fill out the form and notify the provider. If you have any questions please feel free to ask one of the unit sepsis champions (Shannon, Ruby or Lauren B.) and we would be happy to assist you with any questions you have.

Time is life so please remain vigilant ☺

Thank you!

NSICU Sepsis Champions

Letter #2

You are receiving this email because in February you had a SEPSIS alert fire on one of your patient's and the form was not filled out in the 60-minute time frame.

On 2/8/2019 _____ had an alert fire. Please make sure to fill out the sepsis PowerForm that pops up in care compass as soon as possible.

The national sepsis guidelines allow for 1 hour to start interventions if sepsis is suspected. Please make sure to call or page the primary provider and let them know why the alert fired and ask for recommendations on how they would like to proceed with the sepsis alert.

If sepsis is not suspected that is okay but you still have to fill out the form and notify the provider. If you have any questions please feel free to ask one of the unit sepsis champions (Shannon, Ruby or Lauren B) and we would be happy to assist you with any questions you have.

Time is life so please remain vigilant ☺

Thank you!

NSICU Sepsis Champions

Appendix D

SWOT Analysis

Objective:
Increase the NSICU compliance of Sepsis alert acknowledgements to the top tier of the hospital benchmark standards.

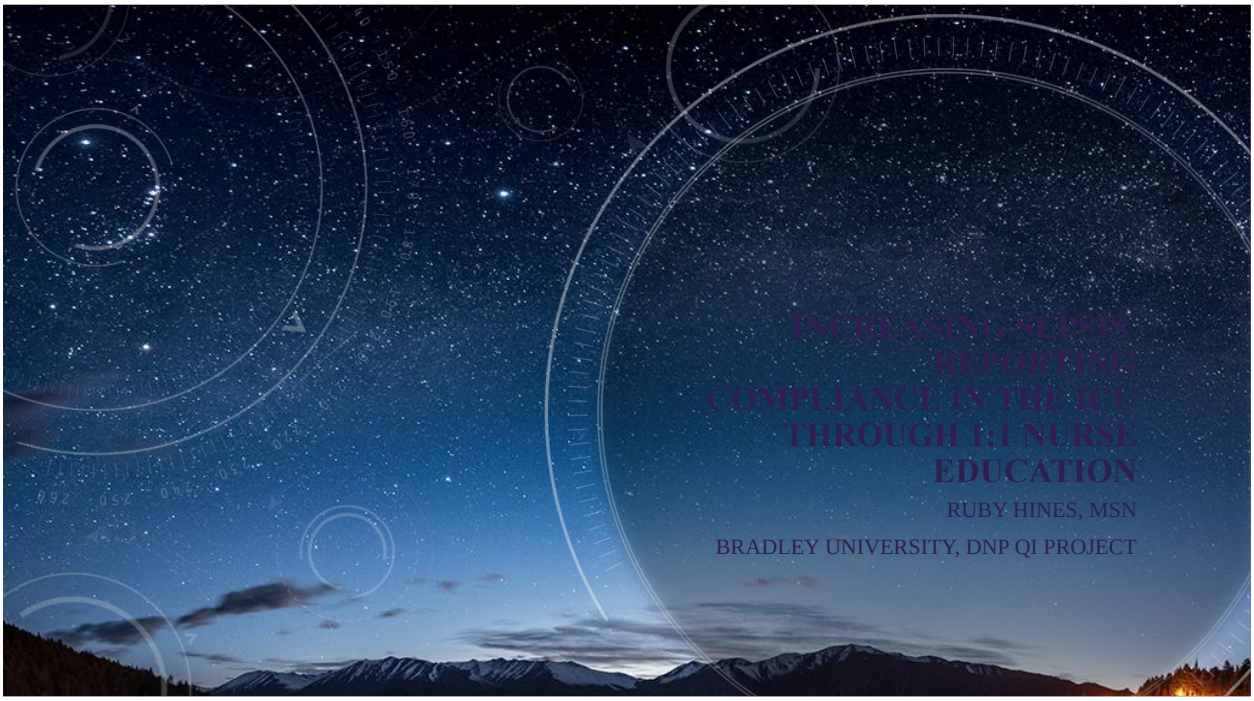
Internal Factors	
Strengths (+)	Weaknesses (-)
• Strong stakeholder buy-in • Planned intervention is evidence based in literature • Facility supports decreased sepsis occurrences as mission driven • Facility promotes health and well-being • The sepsis objective aligns with the mission of the organization • There is recent funding for an approved sepsis team in the organization	• Change is difficult to manage with RNs and MDs • No sepsis category on current rounding sheet for ICU or step-down/general patient population • Employ off-service rounding teams to use current rounding sheets • Sepsis increases LOS, readmissions, medical costs for organization

External Factors	
Opportunities (+)	Threats (-)

• Meet with quality department to determine organizational opportunities • Attend hospital sepsis meetings • Increase unit nursing education 1:1 • Share follow-through during physician rounds • Create dashboard to track improvement and share at monthly practice council • Re-engage current unit sepsis champions	• Ineffective communication between the RN shifts, day and nightshift • Ineffective communication between RNs and physicians • Ineffective follow-p • Ineffective monthly reporting during unit practice council • No dashboard in place for comparison from year to year • Unit employees do not like change
Evaluation of Objective:	
Strong stakeholder support, buy-in, data driven, EBP facility that is also mission driven. Patient safety is paramount, and the organization supports the changes to minimize weaknesses and threats to meet the unit, hospital, and national bench-marks.	

Appendix E

Staff PowerPoint



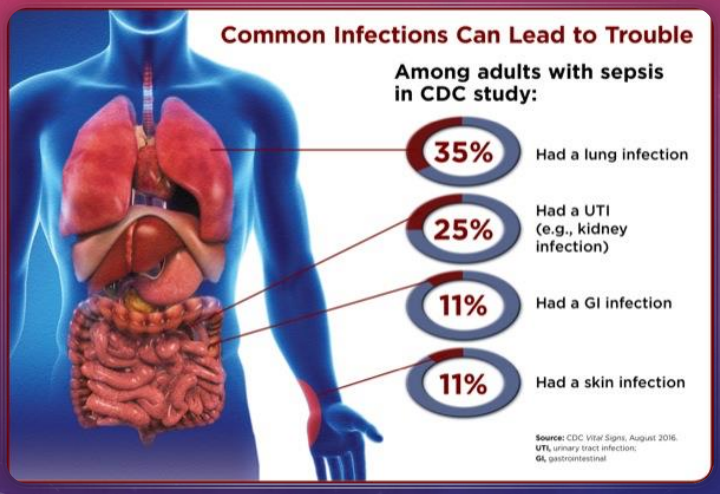
WHAT IS SEPSIS?

- Sepsis is the body's extreme response to an infection. It is a life-threatening medical emergency. Sepsis happens when an infection you already have —in your skin, lungs, urinary tract, or somewhere else—triggers a chain reaction throughout your body. Without timely treatment, sepsis can rapidly lead to tissue damage, organ failure, and death.
- Sepsis is a complication of an infection that can be contagious, but sepsis is not itself contagious. Most sepsis is caused by bacterial infections, but it can be a complication of other infections, including viral infections, such as COVID-19 or influenza(cdc.gov, 2020)
- .Even after hospitalization, 60% of people with severe sepsis go on to experience long term cognitive and physical impairment (Iwashyna, Ely, Smith & Langa, 2010).

WHO IS AT RISK FOR SEPSIS?

- Anyone can get an infection, and almost any infection can lead to sepsis. Some people are at higher risk of infection and sepsis:
- • Adults 65 or older
- • People with chronic conditions, such as diabetes, lung disease, cancer and kidney disease
- • People with weakened immune systems
- • Children younger than one
- The most frequently identified germs that cause infections that can develop into sepsis include Staphylococcus aureus (staph), Escherichia coli (E. coli), and some types of Streptococcus.

(cdc.gov, 2020).



FACILITY'S GOAL IS IN ALIGNMENT WITH THE INTERNATIONAL SEPSIS MORTALITY GOALS

Spreading & Cultivating awareness of sepsis

Educating/training healthcare professionals

Intensifying treatment implementation

Improving/strengthening post-ICU care; expanding care guidelines

Employing sepsis performance

Implementing performance by instituting hospital-wide sepsis improvement programs

(Society of Critical Care Medicine, 2019)

FAMOUS SEPSIS CASES

We don't hear about sepsis in the news very often but it has touched many famous people. Here are just a few examples:

- **Mother Teresa & Pope John Paul II**
- **Muhammad Ali**, Boxer
- **Christopher Reeve**, Actor
- **Jim Henson**, Creator of the Muppets
- **Casey Kasem**, Radio Personality/Actor
- **Patty Duke**, Actor
- **James A. Garfield**, U.S. President
- **William Henry Harrison**, U.S. President
- **Brittany Murphy**, Actor
- **Bernie Mac**, Actor/Comedian
- **George Michael**, Musician
- **Etta James**, Musician
- **Lawrence Welk**, Musician

For a more complete list of names: www.sepsis.org/sepsis-and/celebrities

FUN FACTS

WHAT'S THE DIFFERENCE?

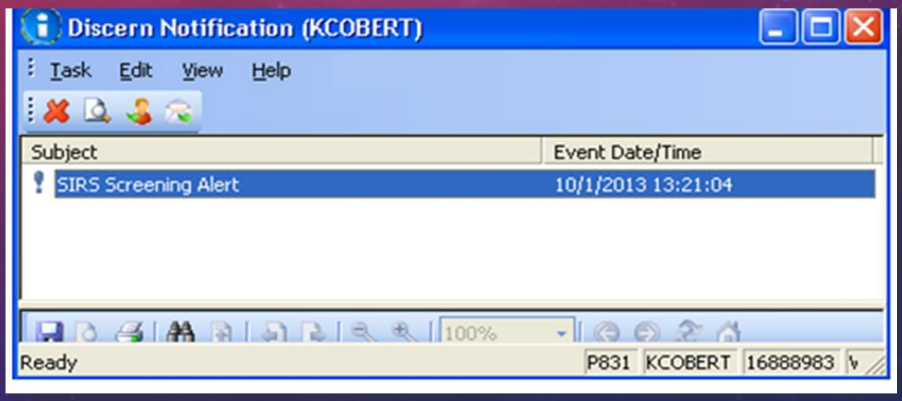
- ***SIRS***
  - Systemic Inflammatory Response Syndrome
  - SIRS is signs or signals of an initial reaction or inflammatory response to a stressor
- ***Sepsis***
  - SIRS + Infection + Organ Dysfunction
  - Sepsis is the disease state in which the body has decompensated in response to the stressors
- ***Septic Shock***
  - SIRS + Infection + Organ Dysfunction + hypotension **despite** IV fluids

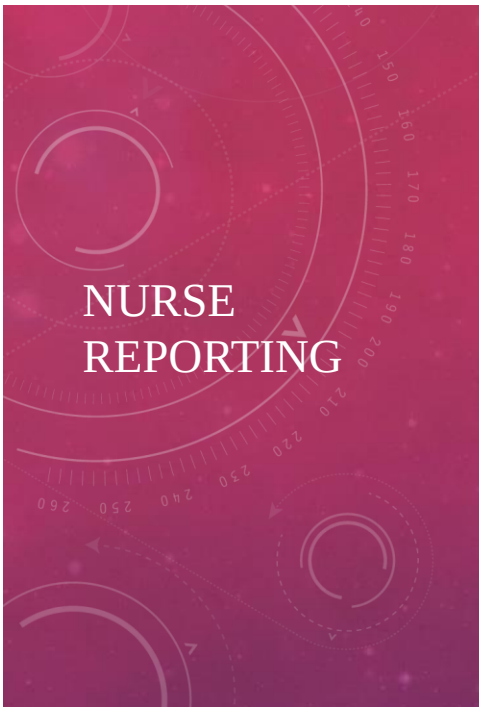
WHO RECEIVES THE SEPSIS ALERTS

- Any nurse who has a relationship with the patient (you will receive the alert until you inactivate the relationship)
- The system automatically assigns the relationship when Nurses opens each patient's chart
- The nurse does not need to have the patient's chart open in order to receive an alert
- ICUs will receive alerts on their non-intensive level of care patients

PAs, NPs and MDs **DO NOT receive these alerts b/c they do not have established relationships with the patients in the computer system

SIRS/SEPSIS ALERT ALSO ON THE CARE COMPASS





The nurse is the primary bedside provider

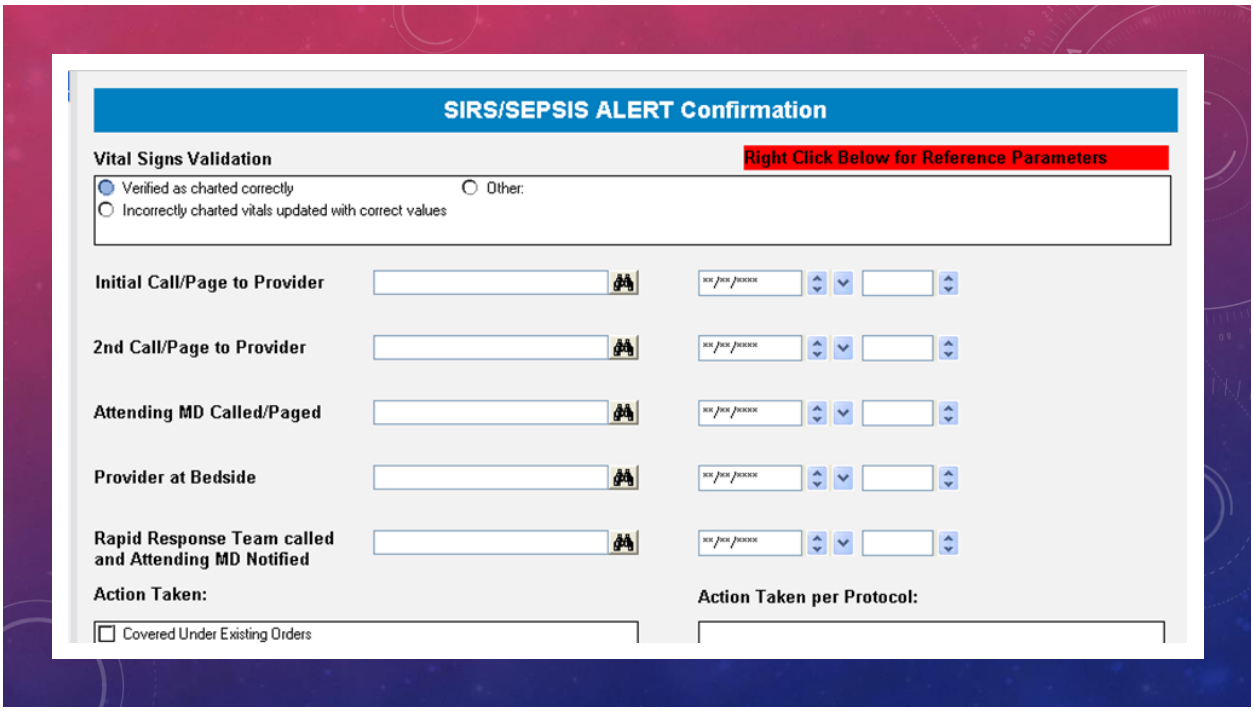
It gives the nurse a chance to verify that the vital signs were charted correctly.

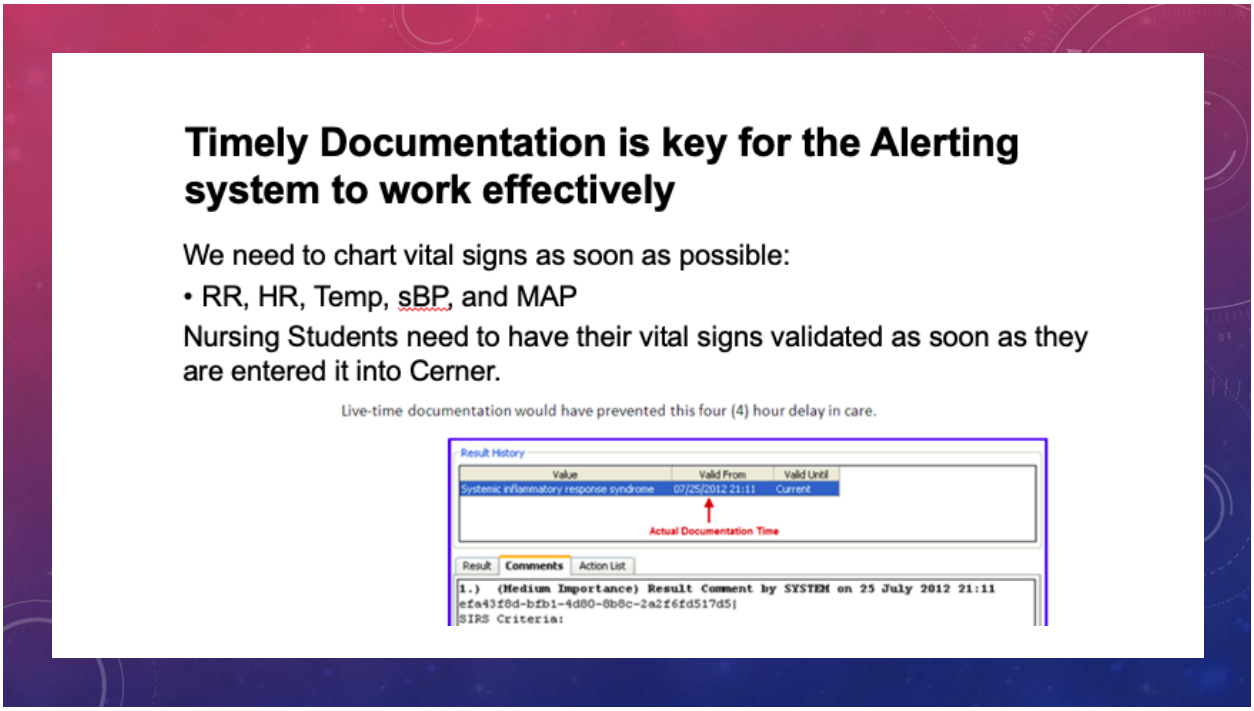
Once the vital signs have been verified, then the nurse escalate as appropriate

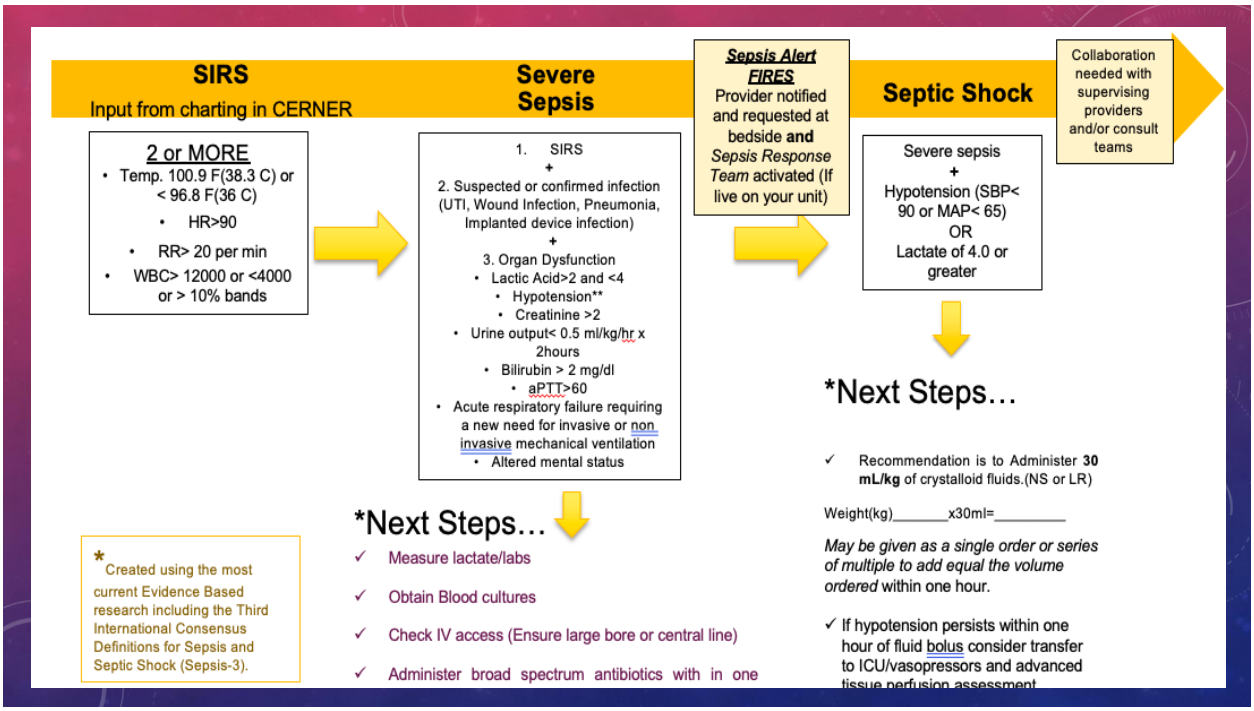
WHAT IS NEXT?

- 1. Validate the charted vital signs are correct
- 2. Contact the Provider
- 3. Document actions taken on the S*IRS/Sepsis* Powerform*
- *The form can be opened from the PAL, in iView, or from the Task list


SBAR TO CALL OR PAGE PHYSICIAN TO ALERT THEM OF THE FIRED ALERT ON THEIR PATIENT
• S: A St. John SEPSIS alert fires on your patient.
• B: Language used while paging providers varies.
• A: A standardized paging language is needed.
• R: Use→ "Sepsis Alert fired. Please come see patient Smith in room #X on Unit or Floor X. Thanks Nurse Doe. 123-4567"

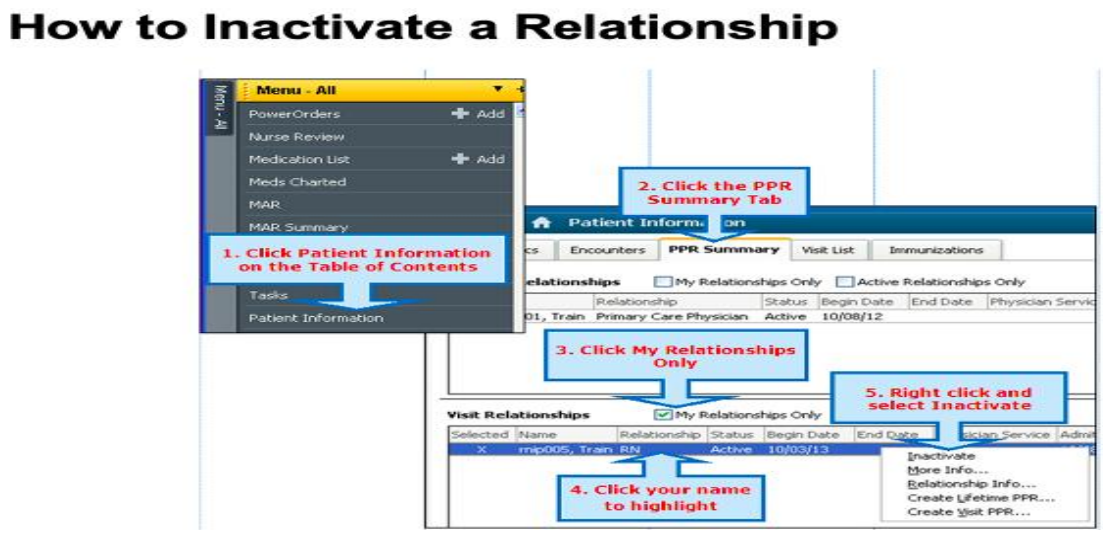

SIRS/SEPSIS ALERT Confirmation
Vital Signs Validation
Right Click Below for Reference Parameters
Verified as charted correctly
Other:
Incorrectly charted vitals updated with correct values
Initial Call/Page to Provider
2nd Call/Page to Provider
Attending MD Called/Paged
Provider at Bedside
Rapid Response Team called and Attending MD Notified
Action Taken:
Action Taken per Protocol:
Covered Under Existing Orders


Timely Documentation is key for the Alerting system to work effectively
We need to chart vital signs as soon as possible:
• RR, HR, Temp, sBP, and MAP
Nursing Students need to have their vital signs validated as soon as they are entered it into Cerner.
Live-time documentation would have prevented this four (4) hour delay in care.
Result History
Value
Valid From
Valid Until
Systemic inflammatory response syndrome
07/25/2012 21:11
Current
Actual Documentation Time
Result
Comments
Action List
1.) (Medium Importance) Result Comment by SYSTEM on 25 July 2012 21:11
efa43f8d-bfb1-4d80-8b8c-2a2f6fd517d5|
SIRS Criteria:



Question: why do the patient alerts continue to show up on your list when you no longer care for them or when they are not on the unit anymore?

- **ANSWER**: The patient will continue to show up on your list as long as they are in the hospital and will not drop off unless you inactivate your relationship with them . See next slide


How to Inactivate a Relationship
Menu - All
PowerOrders
Add
Nurse Review
Medication List
Add
Meds Charted
MAR
MAR Summary
Tasks
Patient Information
1. Click Patient Information on the Table of Contents
2. Click the PPR Summary Tab
Patient Inform
Encounters
PPR Summary
Visit List
Immunizations
My Relationships Only
Active Relationships Only
Relationship
Status
Begin Date
End Date
Primary Care Physician
Active
10/08/12
3. Click My Relationships Only
5. Right click and select Inactivate
Visit Relationships
My Relationships Only
Selected
Name
Relationship
Status
Begin Date
End Date
mip005, Train
RN
Active
10/03/13
Inactivate
More Info...
Relationship Info...
Create Lifetime PPR...
Create Visit PPR...
4. Click your name to highlight


THANK YOU!
RHINES@MAIL.BRADLEY.EDU

REFERENCES

Dugar, S., Choudhary, C.. & Duggal, A. (2020). Sepsis and septic shock: Guideline-based management. *Cleveland Clinic Journal of Medicine,* 87 (1) 53-64; **DOI:** 10.3949/ccjm.87a.18143

Iwashyna, T.J., Ely, E.W,. Smith, D.M., Langa, K.M, (2010). Long-term cognitive impairment and functional disability among survivors of severe sepsis. *Journal of American Medical Association, 304(16)*:1787-94. doi: 10.1001/jama.2010.1553. PMID: 20978258; PMCID: PMC3345288

Singer, M., Deutschman, C., Seymour, C. W. (2016) The third international consensus definitions for sepsis and septic shock. *JAMA*. 2016.315(8):p. 801-810. doi:10.1001/jama.2016.0287

www.cdc.Gov (2020). Its time to talk about sepsis? https://www.cdc.gov/sepsis/pdfs/Consumer_brochure_its-time-to-talk-about-sepsis-P.pdf

www.cdc.gov (2020). *Educational information; get the facts*. https://www.cdc.gov/sepsis/education/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fsepsis%2Fget-ahead-of-sepsis%2Findex.html

www.gleauty.com (2015). *Sepsis know from day 1*. https://www.gleauty.com/XX/Unknown/422123077845334/Sepsis-Know-From-Day-1?__cf_chl_jschl_tk__=ddcb8149d0c9c548eea4b964d72aa4322bd6544b-1604889509-0-AUaeUv8siHf4sa_IZTZhhSofA7LP7uAkokETPWJryXBMEo_l09K_6cdz6U1ZW_2LzG-BH2j7yyeN2ePGuVjlqn_zJgw2-gZDtlCrML2RFvWxE2AHwOPyuHxoL2PSC7xVo0UPF-ECSkJE7VA8AU9wU2KLzkLzckuT9Ef4g4q3g9Ta-1mWRpow8IEIYCGAqX3M_efCkiI8oB3YUSrZa0QC-m6-Dqsnfk3cBymtfuLNG1RGz_AbVKloa-nmVc0UNnlhdTXPUr-8Dfud1qEK3- f9eU6vDqJfH-RDFedb7Pu7dV1lvghOJ_PjKa7cQS5q921EnbiewmsHcw_vR1ZXObX50Gr9n-gV855NLMsbIQ-bIJssYsPPk- Wk6KjFplSiIYvrycAqh0AIpm2TyaJCBxovPzQ

Appendix F

Sepsis Poster

Reducing Sepsis in the Neuro-Science Intensive Care Unit through 1:1 Nurse Education

Ruby Hines, MSN (FNP/DNP student)

Bradley University

INTRODUCTION

- Sepsis is the body's overwhelming and life-threatening response to infection that can lead to tissue damage, organ failure, and death. It is the body's overactive and toxic response to an infection. Sometimes the immune system stops fighting and begins to turn on itself, which is the start of sepsis (sepsis.org, 2020).
- Sepsis is one of the significant risk factors identified that leads to in-hospital death, discharge to hospice facilities, or 30-day readmissions (Hajj, Blaine, Salavaci, & Jacoby, 2018).
- The role of Intensive Care Unit (ICU) nurses in quality improvement of sepsis care are significant for early intervention, patient survival, and decreased overall mortality (Kleinpell, 2017).
- Timely reporting of sepsis triggers in the Neuroscience Intensive Care Unit (ICU) could reduce the incidence of sepsis that leads to septic shock and eventually mortality if under-reported and not treated.
- Within the timeframe of sepsis reporting the first three hours, also known as "the golden hours" are the most important in the intervention of the sepsis cascade.
- The project aim is to report the triggered EMR sepsis alert to medical staff within a one-hour timeframe with a compliance goal of 90% .

Tools and Methods

Establishing a mentor for 1:1 nurse education by the DNP student-DNP essentials (VI, VIII) collaborating with expert in practice or observational time with experts in the healthcare or a related field data mining and extraction, DNP essentials (I-VIII) streamline the PICO question so that it makes sense for the current DNP project. Add St. John's Sepsis information (hospital-based tool used for SIRS/SEPSIS) to current EET, DNP essentials (II, V, VI, VIII) committee for the Neuroscience ICU unit, replace outgoing members of hospital Critical Care Practice Council as a representative for Neuroscience Unit, and DNP essentials (VI, VII, VIII) Development and presentation of a Sepsis PowerPoint that is specific to the Neuroscience population and added to the hospital's SharePoint for all employees and administration. Create a Sepsis bulletin board on the unit for sharing sepsis data to staff and visitors.

OBJECTIVE

This project aims to determine what are the gaps in education for NSICU nurses as it relates to sepsis alert reporting, instituting timely treatment, intervening in outcomes, and mortality rates. When staff follow the sepsis guidelines for treatment within the golden hours of identification (1 hour) mortality should decrease in patients with sepsis markers.

STUDY VARIABLES

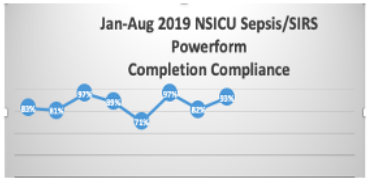
Independent Variable: 1:1 Nurse Education

Dependent Variable: Sepsis Compliance Percentage

Study Design

1:1 Nurse education

Jan 2019-August 2019
(Pre-1:1 Nurse Education)



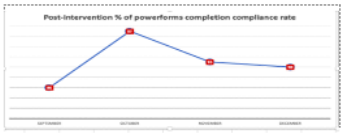
PROJECT DESIGN

The proposed project is a sepsis quality improvement project to increase the percentage of compliance reporting in the Neuroscience Intensive Care Unit's to the benchmark of 90% .

If early recognition, early administration of antibiotics, fluid resuscitation, vasoactive medications, and lactate levels are drawn based on patient vital signs triggers and presentation septic shock is dramatically decreased (Wheeler, 2015).

The setting of the project is on a 27-bed intensive care unit with three of the 27 beds dedicated to step-down patients. The Neuroscience Intensive Care Unit is located in a level one trauma center on the east coast in an urban setting. Population/Sample proposed will be n=75 nurses in the Neuroscience Intensive Care Unit, to include all FTE's.

September 2019-December 2019
(Post-1:1 Nurse Education)



REFERENCES

Castelluci, M. (2017). Sepsis mortality rate on the rise. Retrieved from, https://www.modernhealthcare.com/article/20170925/NEWS/170929930.

Hajj, J. , Blaine, N., Salavaci, J., & Jacoby, D. (2018). The "Centrality of Sepsis": A Review on Incidence, Mortality, and Cost of Care. *Healthcare (Basel)*. 2018 Sep; 6(3): 90. Published online 2018 Jul 30. doi: 10.3390/healthcare6030090

Hershey, T.B. & Kahn, J. M. (2017). State sepsis mandates—a new era for regulation of hospital quality. *New England Journal of Medicine*, 2017 June 15; 376:2311-2313, doi: 10.1056/NEJMp1611928.

Kleinpell R. (2017). Promoting early identification of sepsis in hospitalized patients with nurse-led protocols. Critical care (London, England), 21(1), 10. doi:10.1186/s13054-016-1590-0.

ACKNOWLEDGEMENTS

Chris Szabo, MSN, PhD
Judy Waller, MSN, Ed
NSICU nursing staff

Appendix G

Revised NSICU Sepsis Rounding Sheet

NSICU STEPDOWN ROUNDING SHEET

Date
Service
Contact Number/Pager

- ☐ SEPSIS alert fired?
- ☐ Restraint orders correct and renewed, if needed
- ☐ Daily am labs ordered & REPLETION orders
- ☐ Lab results reviewed and changes addressed
- ☐ Repletion medications ordered, if needed
- ☐ Trach changed and downsized, if needed
- ☐ Nutrition needs (at goal), LBM
- ☐ Sleep or delirium needs met
- ☐ Speech, OT, PT ordered and appropriate
- ☐ Consults followed up, if needed
- ☐ Disposition date plan & Needs

Revised 12/2/2019 by Ruby Hines, MSN

Appendix H

Deidentified Sepsis Information

Order Type	Orig Order Dt Tm	Orig Order Date	Orig Order Time	Order Loc	Powerform DateTime	Powerform Date	Powerform Time	PFT-OOT	Powerform Y/N	Vital Verification - Part1
SIRS Alert	Oct 8, 2019 12:42:00 PM	10/08/2019	12:42:00 PM	C11A	Oct 8, 2019 12:51:53 PM	10/08/2019	12:51:53 PM	0:09	Y	Verified as charted correctly
Sepsis Alert	Oct 22, 2019 5:31:28 AM	10/22/2019	05:31:28 AM	C11A	Oct 22, 2019 6:36:42 AM	10/22/2019	06:36:42 AM	1:05	Y	Other:
SIRS Alert	Oct 22, 2019 3:41:25 AM	10/22/2019	03:41:25 AM	C11A	Oct 22, 2019 6:31:18 AM	10/22/2019	06:31:18 AM	2:49	Y	Verified as charted correctly
SIRS Alert	Oct 24, 2019 2:43:32 PM	10/24/2019	02:43:32 PM	C11A	Oct 24, 2019 3:48:19 PM	10/24/2019	03:48:19 PM	1:04	Y	Verified as charted correctly
SIRS Alert	Oct 21, 2019 12:45:48 PM	10/21/2019	12:45:48 PM	C11A	Oct 21, 2019 12:48:31 PM	10/21/2019	12:48:31 PM	0:02	Y	Incorrectly charted vitals updated with correct values
SIRS Alert	Oct 20, 2019 4:55:06 PM	10/20/2019	04:55:06 PM	C11B	Oct 20, 2019 5:31:41 PM	10/20/2019	05:31:41 PM	0:36	Y	Verified as charted correctly
SIRS Alert	Oct 17, 2019 2:34:04 AM	10/17/2019	02:34:04 AM	C11B	Oct 17, 2019 2:38:11 AM	10/17/2019	02:38:11 AM	0:04	Y	Verified as charted correctly
SIRS Alert	Oct 27, 2019 1:15:50 PM	10/27/2019	01:15:50 PM	C11B	Oct 27, 2019 1:40:15 PM	10/27/2019	01:40:15 PM	0:24	Y	Verified as charted correctly
SIRS Alert	Oct 28, 2019 2:06:40 PM	10/28/2019	02:06:40 PM	C11B	Oct 28, 2019 3:03:42 PM	10/28/2019	03:03:42 PM	0:57	Y	Verified as charted correctly
Sepsis Alert	Oct 2, 2019 12:21:55 PM	10/02/2019	12:21:55 PM	C11C	Oct 2, 2019 12:27:23 PM	10/02/2019	12:27:23 PM	0:05	Y	Incorrectly charted vitals updated with correct values
SIRS Alert	Oct 14, 2019 6:51:42 AM	10/14/2019	06:51:42 AM	C11C	Oct 14, 2019 7:06:17 AM	10/14/2019	07:06:17 AM	0:14	Y	Verified as charted correctly
Sepsis Alert	Oct 31, 2019 1:13:41 AM	10/31/2019	01:13:41 AM	C11C	Oct 31, 2019 1:48:59 AM	10/31/2019	01:48:59 AM	0:35	Y	Verified as charted correctly
SIRS Alert	Oct 7, 2019 4:41:17 PM	10/07/2019	04:41:17 PM	C11C					N	
Sepsis Alert	Oct 14, 2019 2:56:34 AM	10/14/2019	02:56:34 AM	C11C	Oct 14, 2019 3:08:03 AM	10/14/2019	03:08:03 AM	0:11	Y	Verified as charted correctly
SIRS Alert	Oct 30, 2019 9:18:33 PM	10/30/2019	09:18:33 PM	C11D	Oct 30, 2019 11:36:12 PM	10/30/2019	11:36:12 PM	2:17	Y	Other:
SIRS Alert	Oct 11, 2019 5:04:36 PM	10/11/2019	05:04:36 PM	C11D	Oct 11, 2019 5:08:34 PM	10/11/2019	05:08:34 PM	0:03	Y	Incorrectly charted vitals updated with correct values
SIRS Alert	Oct 9, 2019 5:47:35 AM	10/09/2019	05:47:35 AM	C11D	Oct 9, 2019 9:42:51 AM	10/09/2019	09:42:51 AM	3:55	Y	Incorrectly charted vitals updated with correct values
Sepsis Alert	Oct 9, 2019 9:57:43 AM	10/09/2019	09:57:43 AM	C11D	Oct 9, 2019 12:44:30 PM	10/09/2019	12:44:30 PM	2:46	Y	Verified as charted correctly
Sepsis Alert	Oct 4, 2019 9:23:58 PM	10/04/2019	09:23:58 PM	C11D	Oct 4, 2019 11:25:20 PM	10/04/2019	11:25:20 PM	2:01	Y	Verified as charted correctly
Sepsis Alert	Oct 16, 2019 8:03:51 PM	10/16/2019	08:03:51 PM	C11D	Oct 16, 2019 11:21:58 PM	10/16/2019	11:21:58 PM	3:18	Y	Other:
Sepsis Alert	Oct 12, 2019 12:20:13 PM	10/12/2019	12:20:13 PM	C11D	Oct 12, 2019 3:18:17 PM	10/12/2019	03:18:17 PM	2:58	Y	Other:
SIRS Alert	Oct 16, 2019 1:53:38 PM	10/16/2019	01:53:38 PM	C11D	Oct 16, 2019 7:33:25 PM	10/16/2019	07:33:25 PM	5:39	Y	Verified as charted correctly
SIRS Alert	Oct 17, 2019 7:09:39 PM	10/17/2019	07:09:39 PM	C11D	Oct 17, 2019 8:36:22 PM	10/17/2019	08:36:22 PM	1:26	Y	Incorrectly charted vitals updated with correct values
SIRS Alert	Oct 19, 2019 3:43:50 AM	10/19/2019	03:43:50 AM	C11D	Oct 19, 2019 3:57:08 AM	10/19/2019	03:57:08 AM	0:13	Y	Incorrectly charted vitals updated with correct values
SIRS Alert	Oct 20, 2019 10:49:54 AM	10/20/2019	10:49:54 AM	C11D	Oct 20, 2019 10:52:23 AM	10/20/2019	10:52:23 AM	0:02	Y	Incorrectly charted vitals updated with correct values
SIRS Alert	Oct 21, 2019 11:45:47 AM	10/21/2019	11:45:47 AM	C11D	Oct 21, 2019 1:12:17 PM	10/21/2019	01:12:17 PM	1:26	Y	Incorrectly charted vitals updated with correct values
SIRS Alert	Oct 23, 2019 2:32:11 AM	10/23/2019	02:32:11 AM	C11D					N	
Sepsis Alert	Oct 23, 2019 11:17:59 PM	10/23/2019	11:17:59 PM	C11D	Oct 23, 2019 11:39:39 PM	10/23/2019	11:39:39 PM	0:21	Y	Incorrectly charted vitals updated with correct values
SIRS Alert	Oct 17, 2019 10:19:20 AM	10/17/2019	10:19:20 AM	C11D	Oct 17, 2019 11:16:44 AM	10/17/2019	11:16:44 AM	0:57	Y	Verified as charted correctly
SIRS Alert	Oct 31, 2019 2:53:44 AM	10/31/2019	02:53:44 AM	C11D	Oct 31, 2019 3:25:24 AM	10/31/2019	03:25:24 AM	0:31	Y	Verified as charted correctly
SIRS Alert	Oct 30, 2019 5:43:26 PM	10/30/2019	05:43:26 PM	C11D	Oct 30, 2019 5:49:34 PM	10/30/2019	05:49:34 PM	0:06	Y	Incorrectly charted vitals updated with correct values
								1:15		
			94%							

Appendix H

Gantt Chart

SEPSIS QI PROJECT

Bradley University, NUR 827
Ruby Hines, MSN

Project Start: Mon, 8/26/2019
Display week: 1

TASK	ASSIGNED TO	PROGRESS	START	END
Task 1	ttend monthly hospital sepsis meeting	100%	1/2/19	11/28/19
Task 2	Review monthly Sepsis alerts	100%	1/2/19	11/28/19
Task 3	ORAL DEFENSE PRESENTATION	100%	4/11/19	4/11/19
Task 4	Present Sepsis presentation to nursing	100%	4/18/19	4/18/19
Task 5	Submit CUSHR application to chair for review	100%	4/18/19	4/18/19
NUR 826/DNP Seminar IIIa				
Task 1	Resubmit CUSHR to newly assigned chair for	100%	5/10/19	7/16/19
Task 2	1:1 Nurse Education	100%	5/10/19	9/1/19
Task 3	Submit IRB to facility for approval	100%	6/15/19	6/22/19
Task 4	Submit Letter to IRB	100%	6/9/19	6/10/19
Task 5	Submit tool for IRB	100%	6/9/19	6/10/19
Task 6	Sbmit Gantt chart for IRB	100%	6/10/19	6/10/19
NUR 827/ DNP Seminar IIIb				
Task 1	ttend monthly hospital sepsis meeting	100%	5/10/19	11/28/19
Task 2	Review monthly sepsis alerts	100%	1/31/19	11/28/19
Task 3	Submit sepsis data to monthly dashboard	100%	1/31/19	11/28/19
Task 4	Create PowerPoint for facility sharepoint site	100%	8/26/19	8/31/19
Task 5	Create sepsis poster	100%	8/26/19	8/31/19
Task 6	Compliation of data	100%	11/29/19	1/15/20
Task 7	Dissemination of project results to sta:	0%	12/9/20	12/19/20

Appendix J

Facility IRB Notification: IRB Correspondence

From: IRBPANELA@VCU.EDU <IRBPANELA@VCU.EDU>
Subject: Notification: IRB HM20016804 Hines - IRB Correspondence
TO: Ruby Hines
CC: Christina Szabo
FROM: Facility IRB Panel A
RE: Ruby Hines; HM20016804 Increasing Sepsis Reporting Compliance in the Intensive Care Unit through 1:1 Nurse Education

To be subject to the regulations, a study must meet the definitions for BOTH *"human subject"* AND *"research"*. While your study may fit one of these definitions, it does not fit both. Therefore, your study is not subject to the regulations and no IRB review or approval is required before you proceed with your study.

> Section 45 CFR 46.102(l) of the HHS Regulations for the Protection of Human Subjects defines ***research*** as "*a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge. Activities which meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program which is considered research for other purposes.*"
>
> Section 45 CFR 46.102(e)(1) of the HHS Regulations for the Protection of Human Subjects defines a ***human subject*** as *"a living individual about whom an investigator conducting research:*
>
> - *Obtains information or biospecimens through intervention or interaction with the individual, and uses, studies, or analyzes the information or biospecimens; or*
> - *Obtains, uses, studies, analyzes, or generates identifiable private information or identifiable biospecimens."*

Thank you for informing us of the project. If we can be of service with respect to future research studies, please contact us.

If you have any questions, please contact the Office of Research Subjects Protection (ORSP) or the IRB member(s) assigned to this review. Reviewer contact information is available by clicking on the Reviewer's name at the top of the study workspace.

Thank you for your continued collaboration in maintaining the facility's commitment to protecting human participants in research.

Appendix K

Bradley University CUSHR Approval Letter

DATE: 27 AUG 2019
TO: Ruby Hines, Judith Walloch
FROM: Bradley University Committee on the Use of Human Subjects in Research
STUDY TITLE: Increasing sepsis reporting compliance in the intensive care unit through 1:1 nurse education
CUHSR #: 24-19
SUBMISSION TYPE: Initial Review
ACTION: Approved
APPROVAL DATE: 27 AUG 2019
REVIEW TYPE: Quality Assurance

Thank you for the opportunity to review the above referenced proposal. The Bradley University Committee on the Use of Human Subject in Research has determined the proposal to be NOT HUMAN SUBJECTS RESEACH thus exempt from IRB review according to federal regulations and is in agreement with the Virginia Commonwealth University IRB in this determination.

The study has been found to be not human subject research pursuant to 45 CFR 46.102(i), not meeting the federal definition of research (not contributing to generalizable knowledge). Please note that it is unlawful to refer to your study as research.

Your study does meet general ethical requirements for human subject studies as follows:

1. Ethics training of research personal is documented.
2. The study involves no more than minimal risk and does not involve vulnerable population.
3. Subject selection is equitable.
4. A consent process that can be waived.
5. Adequate provisions are made for the maintenance of privacy and protection of data.
6. The gathering of Protected Health Information is permitted in the HIPAA regulations in that the investigator is part of the covered entity and the quality improvement project is considered a part of the health care operations pursuant to 45 CFR 164.506(c)(4).

Please submit a final status report when the study is completed. A form can be found on our website at https://www.bradley.edu/academic/cio/osp/studies/cuhsr/forms/. Please retain study records for three years from the conclusion of your study. Be aware that some professional standards may require the retention of records for longer than three years. If this study is regulated by the HIPAA privacy rule, retain the research records for at least 6 years.

Be aware that any future changes to the protocol must first be approved by the Committee on the Use of Human Subjects in Research (CUHSR) prior to implementation and that substantial changes may result in the need for further review. These changes include the addition of study personnel. Please submit a Request for Minor Modification of a Current Protocol form found at the CUHSR website at

https://www.bradley.edu/academic/cio/osp/studies/cuhsr/forms/ should a need for a change arise. A list of the types of modifications can be found on this form.

While no untoward effects are anticipated, should they arise, please report any untoward effects to CUHSR immediately.

This email will serve as your written notice that the study is approved unless a more formal letter is needed. You can request a formal letter from the CUHSR secretary in the Office of Sponsored Programs.

Appendix L

Mentor's write-up of Student's Sepsis Project used for NSICU Beacon Award for Excellence

Taking advantage of the tuition assistance program offered by VCUHS, there are currently 18 NSICU nurses enrolled in undergraduate, graduate and post-graduate nursing programs who are using this benefit. These nurses often use their course work to investigate and implement evidence-based practice changes on the unit. One example is a DNP project related to sepsis. VCUHS uses a monitoring system that constantly scans the electronic medical record for criteria that indicate possible signs of Systemic Inflammatory Response Syndrome (SIRS) or Sepsis. Communication alerts are sent to the nurses when the data analyzed determines a SIRS or Sepsis risk is present. After the nurse confirms the accuracy of the data they complete an on-line provider alert form and implement any treatments that are ordered. Before the project, compliance with completing this provider notification form was as low as 50%. The DNP student implemented a hip-to-hip, just-in-time educational intervention. Upon completion of the project, completion rates were 97%.