Improving Timely Sepsis Care Through Staff Education Within the Emergency Department

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Improving Timely Sepsis Care Through Staff Education Within the Emergency Department

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Nursing 653, Internship

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Abstract

**Problem:** Sepsis is a life-threatening infection that needs immediate treatment. The ED uses sepsis bundle protocols to treat sepsis but the compliance rates for the order sets are below the institution’s guidelines.

**Context:** A Centers for Medicare and Medicaid Services (CMS) instituted a sepsis performance measure bundle in 2015 called (SEP-1) to promote cost-effective, high-quality care for septic patients admitted to the Emergency Department (ED) (Wang et al., 2020). The ED in a chosen San Francisco, CA acute care hospital has been experiencing unsteady sepsis bundle compliance rates. Sepsis is caught by 1.7 million American adults per year (Malik et al., 2021).

**Intervention:** Based on our gap analysis, we decided to create a sepsis based educational PowerPoint presentation as a learning tool nurses can use to become more proficient with the sepsis order sets. We also created a 36”x48” poster explaining important steps of the QI project. The poster will be displayed on the bulletin board in the unit. Lastly, handouts were created that provided the same information.

**Results:** Because of time constraints, the team was not able to distribute post-intervention surveys. Based on the hospital’s standards, the team agreed that reaching a compliance rate of over 90% in any of the metrics is considered a success.

**Conclusions:** This QI project is considered a success because early sepsis recognition, effective two-way communication and diligent use of the order sets will increase compliance rates due to sepsis nurse education.
**Keywords**: sepsis, compliance, education, nurses, bundle, quality improvement

**Improving Timely Sepsis Care Through Staff Education Within the Emergency Department**

One of the biggest challenges for nurses and physicians within the ED is the management of septic patients. Sepsis, and septic shock, a subdivision of sepsis, is a life-threatening condition that causes organ dysfunction due to an underlying bacterial infection. The timely diagnosis and proper treatment of this condition is crucial in order to minimize mortality, minimize hospital operating costs, and minimize the length of stay (LOS) associated with this aggressive condition.

Septic patients are usually met by a nurse when first admitted to the ED. It is crucial that early recognition by nurses be met. Sepsis screening tools located within the electronic medical record (EMR) must be utilized in order to identify septic patients (See Appendix A). Then, sepsis resuscitation bundles are utilized to manage septic patients.

Compliance with these procedures is sometimes staggering due to factors such as lack of nurse education. The lack of compliance directly affects patient care outcomes and exacerbates the inefficiency within the microsystem. The team had identified the need for improving timely sepsis care through staff education within the ED to increase sepsis bundle compliance rates.

**Problem Description**

A Centers for Medicare and Medicaid Services (CMS) instituted a sepsis performance measure bundle in 2015 called (SEP-1) to promote cost-effective, high-quality care for septic patients admitted to the Emergency Department (ED) (Wang et al., 2020). The ED in a chosen San Francisco, CA acute care hospital has been experiencing unsteady sepsis bundle compliance rates. Sepsis is caught by 1.7 million American adults per year (Malik et al., 2021).
Sepsis compliance rates and sepsis management needs improvement in order to reverse the downward trend which has been documented over the past three months. Sepsis bundle compliance at this hospital consists of obtaining a lactic acid result within 60 minutes of the first vitals taken, antibiotic administration within 60 minutes of receiving the lactic acid results from the laboratory, then lastly, administering antibiotics within 35 minutes of the antibiotic order.

Data was collected for *Vitals to Lactic Acid results Within 60 Minutes* for quarter four (Q4) of year 2022, then again in quarter one of 2023. Quarter four, consisting of October, November, and December of year 2022, had a 100% compliance rate in October, 60% compliance rate in November, and a 71% compliance rate in December. Quarter one (Q1), consisting of January, February, and March of 2023 resulted in a 59% compliance rate in January, 60% compliance rate in February, and a 68% compliance rate in March (See Appendix B) (See Appendix C).

Taking the average compliance rates for each quarter averages out to a 77% compliance rate for Q4 of 2022, and a 62% compliance rate for Q1 of 2023. That is a decrease in compliance of 19%, comparing Q1 of 2023 to Q4 of the previous year. This quality improvement (QI) project was developed to raise compliance rates, within three months, in all three areas, to at least 90% after proper nurse education and training.

Timing is an important factor with regards to sepsis bundle compliance. Sepsis screenings need to be done on time, within the designated three- and six-hour interval periods. Completing the sepsis screening consistently will improve sepsis management outcomes and ultimately improve patient care. Factors that decrease compliance rates include educational gaps about sepsis bundle protocol and attitudes from nurses about the sepsis compliance protocol.
Compliance with the sepsis bundle protocol has been proven to decrease mortality and save patient lives (Townsend et al., 2022). Evidence based research has provided evidence that sepsis education and proper, standardized timely documentation have improved SEP-1 compliance rates as well. (Alexander et al., 2022). Through these interventions, the ED in the SF, CA hospital will experience improved sepsis outcomes, specifically an increase in recoveries and a decrease in the mortality rate of septic and septic shock, a sub-division of sepsis, in patients admitted to the ED.

According to data received by the New York Department of Health (Seymour et al., 2017) between the years of 2014-2016, sepsis bundle compliance was analyzed from 149 hospitals, including 49,331 patients. They discovered that the mortality rate was significantly higher with those patients who received the three-hour sepsis bundle within 12 hours but not less than three hours, than the patients who received the bundle in less than three hours. The study revealed that of the three components of the bundle, the most significant was the administration of antibiotics with regards to bundle effectiveness and lower mortality (Seymour et al., 2017).

**Available Knowledge**

**PICOT Question**

A PICOT is used to find the best practice evidence-based research. It helps formulate a searchable clinical question to address a problem. In the adult population who have been admitted to the emergency department (ED) diagnosed with sepsis (P), does sepsis bundle education, which includes timely blood culture collection, antibiotic and fluid bolus administration, and lactate measurements for nurses (I), compared to non-existent sepsis bundle
education (C), increase the sepsis bundle compliance rate to 90% (O), over a period of three months (T)?

**Annotated Bibliography**

The databases used for the search were PubMed and CINAHL. The keywords used were: sepsis, emergency department, bundle compliance, education, mortality, and quality improvement. No revision of my search was necessary. These articles provided the groundwork and EBP for the research focusing on increased sepsis bundle compliance rates due to nurse education and improved interdisciplinary communication.

Alexander, M., Sydney, M., Gotlib, A., Knuth, M., Santiago-Rivera, O., & Butki, N. (2022). Improving Compliance with the CMS SEP-1 Sepsis Bundle at a Community-Based Teaching Hospital Emergency Department. *Spartan Medical Research Journal, 7*(2), 37707. [https://doi.org/10.51894/001c.37707](https://doi.org/10.51894/001c.37707)

This journal article had a focus on improving compliance using the SEP-1 sepsis bundle in the Emergency Department (ED) of a community-based teaching hospital, McLaren Oakland. This hospital has over 31,000 patients visiting the ED, with 4,500 admissions annually. An educational initiative was established around the instruction of using the Sepsis Macro and Sepsis Order Set involving ED residents and attending physicians. After being educated on the metrics of the system, the sepsis bundle compliance rates rose from 57% to 62%, exceeding the national average and institutional target expectations. This study concludes that simple, educational based intervention coupled with diligent use of data entry pertaining to sepsis identification checklists within the electronic medical record will improve sepsis bundle compliance.

This rapid cycle quality improvement (QI) project was implemented to measure the sepsis bundle compliance rates. The comparison was using pre-three-month intervention and post-three-month intervention. The strategy was to incorporate an interdisciplinary team involving nurses, physicians, pharmacists, and the entire healthcare team to implement early sepsis bundle adherence while using existing order sets and checklists. The study was conducted in a 238-bed hospital on the East Coast consisting of a 54-bed ED. First an interdisciplinary team was developed, then a system was developed using alert systems notifying proper personal of suspected septic patient within the ED. The team was created to initiate sepsis bundle compliance early. Next, staff education was initiated using in-services, handouts, and improved verbal communication regarding the new project rollout. Failures included: not using the alert system in a timely manner, failure to use the order sets, failure to complete the sepsis screening, and delayed laboratory interpretation. The program proved a success in increasing sepsis bundle compliance, at least with four out of the five bundle measures, as well as showing a decrease in mortality.


Registered nurses (RNs) from 16 acute care hospitals were anonymously surveyed to study and explore the effects of training, knowledge, skills, and attitudes towards sepsis related management in the healthcare setting. The response rate was 39%, 98 RNs completing the survey.
out the 250 surveys that were distributed. The questionnaire revealed that nurses with sepsis training had better knowledge with National Early Warning Scores (NEWS) and Systemic Inflammatory Response Syndrome criteria involving septic patients. They also were more adherent to follow sepsis screening protocol and possessed a more positive attitude and confident attitude in caring for septic patients.


ER physicians play an important role in septic patients because they are the first to encounter it during admission. The proactive approach to find an accurate initial diagnosis, resuscitation and early antibiotic treatment are the hallmarks of early sepsis intervention. Since the Surviving Sepsis Campaign (SSC) in 2016, numerous studies have brought light to the pathophysiology of sepsis and have warranted alterations to the existing treatment plan. These alternations include changes to fluid therapy, vasopressor administration, and antimicrobial therapy. Some doctors believe receiving fluids by the third hour of sepsis identification is too late, and some argued the standard 30 ml/kg of crystalloids given was deemed not suitable for all patients. There is also a growing consensus that early norepinephrine (NE) administration benefits the patient in that it improves arterial tone and improves tissue perfusion. There is also new debate on the type and amount of antibiotics used because all patients are different.

This was a retrospective cohort study to explore the optimal bundle of recommendations that minimize 28-day mortality. Limited compliance using the SSC guidelines is limited, contributing to an increased mortality rate. Patients with sepsis or who were in septic shock that were admitted to the Intensive Care Unit (ICU) were extracted from two databases. The Medical Information Mart for Intensive Care-IV (MIMIC-IV) was used for the training and internal validation cohort while the eICU Collaborative Research Database (eICU-CRD) was used as the external validation cohort. The primary outcome measure was the 28-day mortality rate. From the validation cohorts, the bundle groups were defined as patients receiving all recommendations (antimicrobials, balanced crystalloid, insulin therapy, corticosteroids, vasopressors, and bicarbonate therapy). The no-bundle group consisted of patients of whom did not receive all recommendations, where at least one was omitted. The study concluded that the bundle of six recommendations showed a drastic decline in mortality and septic shock.


This peer-reviewed literature review consists of five studies that evaluate the effectiveness of the sepsis six bundle. The sepsis six bundle consists of six actions to be performed on a septic patient after ED admission that was introduced in the UK clinical setting in 2006. Clinician compliance remains low a decade later. This can be attributed to barriers such as: insufficient training, lack of staff resources, limited services that are available, inadequate communication and training. Implementation of the sepsis six bundle alone did not increase compliance rates. Studies found that implementation of an intervention was responsible for increased compliance. Interventions include in-services, staff education and training programs.

According to the Agency for Healthcare Research and Quality (AHRQ), a government agency, a sepsis toolkit was created to identify and impose best practices for dealing with septic patients. The first practice was to develop a sepsis screening tool within the electronic medical record (EMR). Then use a sepsis resuscitation bundle consisting of: obtaining blood cultures, administering antibiotics, measuring serum lactate, managing fluid status. This should be done during the first three hours of sepsis diagnoses. Use the three- and six-hour bundles in accordance with the Surviving Sepsis Campaign (SSC) evidenced based guidelines. Lastly, is adopting sepsis measures such as evaluating compliance using measures such as door-to-antibiotic time.


This article discusses the current approaches to sepsis and septic shock, a subdivision of sepsis. According to the World Health Organization (WHO), sepsis is recognized as a global health priority. It is a life-threatening infection that causes severe organ dysfunction. The populations that are highest at risk are the very young or old and people who have comorbidities such as diabetes, cancer, or weakened immune systems. The 2016 consensus of sepsis includes suspected infection and an acute change in the Sequential Organ Failure Assessment (SOFA) score equal or greater than two points following the infection. Septic shock includes: having sepsis,
hypotension requiring vasopressor therapy, and having a serum lactate greater than two mmol/L after fluid resuscitation. After sepsis screening and assessing/monitoring organ function and hemodynamics, resuscitation is performed if patient is hemodynamically unstable or has an elevated lactate level. These measures include: obtaining blood cultures, administering antibiotics, administering intravenous (IV) crystalloid solution, administering vasopressors and remeasuring lactate levels.


This article argues that the implementation of the sepsis measure performance bundle (SEP-1) instituted in 2015 by the Centers for Medicare and Medicaid Services (CMS) should not be a “one size fits all” protocol to treat septic patients. There are not enough randomized control trials to convince many scientists and physicians that it is beneficial and that it causes no harm. Some of the arguments revolve around proper antibiotic administration and proper fluid resuscitation. Patients who have congestive heart failure (CHF) or end-stage renal disease may not need as much fluid resuscitation as a healthy 40-year-old. The immediate administration of broad-spectrum antibiotics may harm an otherwise healthy person who may not even have sepsis. Elevated lactate levels do not necessarily correspond with sepsis, but may be a physiological response to other factors such as: CHF, renal or liver failure, and thiamine deficiency. SEP-1 compliance has been low due to low quality data. Justification with non-compliance include: uncertainty about the patient’s sepsis diagnosis, avoidance of antibiotics in someone who doesn’t need them, and lack of high-quality data that physicians need.
A quality improvement team was created to improve sepsis bundle compliance in the ED through the utilization of an electronic health record tool. This QI project occurred at NYU Langone Hospital in Brooklyn which houses 450 beds and admits 80,000 people annually to the ED. They provided training and feedback for the EHR tool. Two retrospective cohort studies were used to compare overall effectiveness of the tool. The first cohort were all patients with intention-to-treat for any sepsis severity. The second cohort consisted of adults admitted to the ED with a diagnosis of severe sepsis or septic shock. Both groups experienced an increase in compliance compared to pre-intervention.

**Rationale**

Our QI project revolved around the conceptual framework of Kurt Lewin’s Theory of Planned Change. Lewin was a pioneer and leader in the field of group dynamics and development. He was one of the early developers that developed the Force Field Analysis (FFA), one of his greatest achievements. The FFA was a framework that identified and examined the forces or factors that influenced a situation. From this, an action plan can be created to reach a desired goal. The FFA is based off two forces, the driving and restraining forces. Discovery of these factors can lead to diminishing or strengthening factors to bring about the desired change (Shirey, 2013).
Inspired by the FFA framework, Lewin develops his own framework involving unfreezing, transitioning, and refreezing. Unfreezing involves getting ready for change. As it applies to the QI project, our team of future Clinical Nurse Leaders (CNLs) recognized the need for change. By performing a microsystem assessment on the unit, gathering evidence-based literature, and performing a gap analysis, we determined that sepsis bundle compliance rates would increase while sepsis fallout rates decreased through increased utilization of sepsis screening tools in the electronic health record (EHR) and nurse education on sepsis bundle order sets after a patient has been admitted to the ED.

The transitioning phase entails creating a detailed plan of action and allowing people to try out the plan. It involves coaching and training so that the team can stay positive, fear less, stay on track and avoid veering off track. As it pertains to this QI project, the transitioning phase encompasses nurse education involving the creation of a PowerPoint presentation to educate nurses on sepsis identification and compliance.

The last part the Lewin’s Change Theory involves refreezing. Refreezing involves stabilizing the change. Clinical Nurse Leaders are responsible for embedding the improved system into the already existing microsystem. Specific measures to analyze the impact and stabilization of the change involve distributing post-surveys asking nurses about their knowledge and utilization on order sets and sepsis screening tools as well as retrieving and comparing the old statistics with the new statistics.

**Specific Aim**

We aim to improve the efficiency and effectiveness of sepsis identification, sepsis management, and interdepartmental compliance in the ED of an acute care hospital located in
San Francisco, CA. The process begins with screening all admitted patients in the ED for sepsis using a sepsis screening tool located within their EMR. The process ends with prompt execution of the sepsis bundle. These measures include: collecting blood cultures in a timely manner so that antibiotics may be administered, prompt fluid resuscitation to correct fluid shifting/hypotension and prompt lactate measurements to measure the degree of septic infection within three hours of admission. By working on the process, we expect an increase in current sepsis bundle compliance, an increase in septic recoveries, and a decrease in septic rollouts, mortality rate and LOS of patients admitted to the ED who have sepsis and septic shock.

It is crucial to work on this now because sepsis is an aggressive condition caused by an infection in the bloodstream. Data from across the United States reveals its high mortality rate and its high cost that financially burdens thousands of hospitals annually. It remains one of the leading causes of death in hospitals; therefore, it is important to focus on admitted ED patients. Thousands of people are admitted and treated in the ED annually for sepsis and septic shock (Seymour et al., 2017).

Section III: Methods

Context
This QI project began with a microsystem assessment of an ED in an urban San Francisco, CA acute-care hospital. A microsystem is a small, interdependent group of people who regularly provide care to a certain group of patients formed around a common purpose. This microsystem, the ED, is part of a bigger system of the hospital, the mesosystem, which is a part of a macrosystem, which would be the organization.

The microsystem assessment, which brings insight into how it compares to a high-performing clinical microsystem includes collecting data on the unit’s purpose, patients, professionals, processes, patterns, and important metrics. A high-performing microsystem is based on characteristics involving: leadership, performance results, and organizational support, to name a few.

**Microsystem Purpose**

This 16-bed unit is classified and accredited as a Level Two Geriatric ED by the American College of Emergency Physicians (ACEP). The purpose of the unit is to provide quality, well-coordinated emergency care as a service to the community. The unit’s goal is to stabilize the patient so they may be discharged, or admitted to another unit for further medical treatment. The purpose, as it relates to the QI project, consists of patients receiving timely sepsis diagnosis and management. The signs and symptoms of a septic infection include: tachycardia, tachypnea, irregular body temperature, rigor, and confusion. Some of the other common conditions that are presented in the unit include: shortness of breath, injuries at home such as falls, bleeding from lacerations, chest pain due to respiratory or cardiac disease, poisoning, and fever (Paoli et al., 2018).

**Microsystem Patients, Professionals & Processes**
Many of the older patients live alone, insured through Medicare, and are widowed which poses a threat to their safety. Elderly who are admitted to the ED often get treated for injuries occurring at home such as fracturing a bone from falling down the stairs. Many lower income patients receiving Medicaid, and the unhoused who do not have insurance at all frequent this ED. A lot of unhoused drug users are “picked off the street” by paramedics due to illicit drug overdosing or by police for disrupting the public. Methamphetamine, also known as “crystal meth” and fentanyl, a highly potent opioid, are drugs that are the most prevalent among the illegal drug using patients. Most of the admitted patients are discharged the same day.

The unit employs 35 registered nurses who can be assigned up to four patients each. The working status of these nurses consist of fulltime, per diem, and travelers. The nurse-to-patient ratio may change based on the acuity of their patients. Because of this, a nurse may be assigned less than four patients. There is at least one physician working the morning shift, two physicians working the night shift, and one working the overnight “noc” shift. The unit also consists of a clinical nurse manager, sepsis coordinator, respiratory therapists, and graduate nursing students.

The process begins when people present to the ED. They may come independently, or come by paramedics or police who have picked them up from a location in the nearby community. The first person on the unit they interact with is the triage nurse. This nurse assesses their complaints, vitals, and any other pertinent physiological, mental, or emotional symptoms they may present with, per “ED Triage Standard Work.” The triage will sometimes identify a patient with a positive sepsis screen. Consistent documentation and prompt identification of sepsis from the triage nurse is important so that doctor and ED staff can be notified and the sepsis bundle may be implemented. Collection of blood cultures, the administration of antibiotics, and lab values must be documented.
Patterns

Prompt sepsis management, utilizing the nurse driven order sets, diligent and timely documentation along with a cohesive staff that practices excellent communication creates effective patterns of sepsis management, lowering the LOS and mortality for septic patients. Decreased compliance with the institution’s order set and RN charting errors has led to an increase in fallouts. These fallouts include: obtaining lactic acid lab values within 60 minutes of the first set of vitals, and the administration of antibiotics within 35 minutes of the doctor’s order. It is important to identify patterns in order to understand where, how, and why the fallouts are occurring.

SWOT Analysis

A SWOT analysis is used during the beginning phases of a project with regards to strategic planning and management. During project planning, it is used to identify the project’s strengths and weaknesses, its internal factors, as well as its opportunities and threats, its external factors, relating to business competition. It helps organizations achieve a competitive advantage over their rivals. The stronger the internal strengths match the external opportunities, the more the project is considered strategically fit (See Appendix D).

Communication Plan

The team met weekly lasting between 30 minutes and an hour to discuss, plan, and collaborate. There was also the clinical that took place at the hospital. Each student spent at least
three full working days performing direct observation with no patient care involved, throughout
the semester. At the clinical, we were able to interact with the healthcare team and patients. The
staff enjoyed teaching and explaining how the unit functions.

**Cost-Benefit Analysis**

A cost-benefit analysis is a process used to determine which actions are worth pursuing. It sums the total rewards expected minus the total cost expected from the project involving measurable financial metrics. It can be used to assess non-financially related metrics as well, such as employee morale and customer satisfaction.

According to the World Health Organization (WHO), sepsis is recognized as a global health priority. It is a life-threatening infection that causes severe organ dysfunction. The cost and burden of sepsis occurred in the less severe sepsis cases where sepsis was not diagnosed until after admission (Paoli et al., 2018). In 2013, sepsis accounted for more than $24 billion in hospital expenses. It accounted for only 3.6% of the hospital stays (Paoli et al., 2018). Sepsis diagnosis within the hospital account for more than twice the cost of other conditions and the cost is growing at an exponential rate. Length of stay (LOS), mortality, and mean daily hospital costs were shown to increase as the severity of sepsis increased.

The overall expense from sepsis without organ dysfunction is ($16,324/case), severe sepsis is ($24,635/case) and septic shock is ($38,298/case) (Paoli et al., 2018). By subtracting the cost of overall cases from the cost of sepsis cases present upon admission, this QI project will realize a net savings of ($2,940/case) from sepsis without organ dysfunction, ($4,787/case) from severe sepsis, and ($6,594/case) from septic shock. This cost savings can be credited to the early
identification of a septic patient, prompt rollout of the sepsis order set, and impeccable communication within the interdisciplinary team (See Appendix E)

The operating costs associated with implementing this project will include labor, the cost of training and educating nurses by management. Training and education will be in the form of hourly in-services, handouts, and posters. There will be a cost for creating and printing the material. The benefit will far exceed the cost of the project.

**Gap Analysis**

A gap analysis is used to determine the needs of the microsystem. It is a method of assessing the performance of the unit to determine what objectives and requirements are being met and those that are not. It analyzes the space between where the unit presently is and where it should be, the targeted desired future state. It is used to benchmark unit performance so that it can be measured against optimal performance levels.

The QI team, consisting of Master’s in Nursing students, created a series of questions to assess specific measures relating to the staff nurses and their understanding of sepsis. The 15 questions included: highest degree achieved, length of time employed at the Northern California hospital, employment status, length of time working as an RN, knowledge of sepsis, knowledge of its early warning signs, tasks able to complete during triage, average time to complete sepsis screen in Epic, confidence using the sepsis workflow, the level of support received from staff while using the sepsis workflow, reasons why the sepsis workflow isn’t able to be completed, reasons to feel uncomfortable using the sepsis workflow, ideas to improve workflow to decrease fallouts, general improvement suggestions and comments.
Eight of the 35 nurses employed on the unit completed the survey, a 23% response rate. Four had a BSN degree, and the other four had an MSN degree. Six nurses have worked there between one and four years, and two have been there less than a year. Over half the nurses who responded work the AM shift, a quarter work the PM shift and none work the Noc shift. Half of the nurses worked part-time, one was per-diem, and the other was a full-time employee. Four nurses have been an RN between five and 10 years, one for less than a year, one between one and four years, and two for over 10 years.

On a scale of one to five, five having an expertise of sepsis, only one nurse rated themselves a two while the others rated themselves fours and fives. On a scale of one to five, five having full understanding of the early signs of sepsis, most rated themselves four and five while one rated themselves a three. During triage, all nurses were able to identify infection appropriately and initiate the sepsis alert when needed. Seven of eight nurses were able to complete the entire sepsis screen and only three utilized the dot phrase when charting. A dot phrase allows commonly used pieces of text to be inserted into the patient’s chart quickly.

All nurses were able to complete the sepsis screen in less than a minute. Only one nurse documented they did not feel confident using the sepsis workflow. 75% of the nurses felt they had the support of other staff members with using the sepsis workflow, the other 25% felt support was either lacking or satisfactory.

Reasons that nurses were not able to meet the sepsis workflow requirements include: MD disputes and discretions; not enough time, resources, and manpower; difficulty starting an IV (hard stick), patient will not hold still during IV insertion, antibiotics not ordered by physician, the fluids are not infusing fast enough, poor coordination/recognition by attending and lack of staffing. One nurse commented they did not feel comfortable using the sepsis workflow because
the MD was not able to see the patient promptly. 25% of the nurses felt strongly that improvement could be made to the sepsis bundle protocol, 37.5% had a neutral stance, and the other 37.5% did not think it was necessary. The gap analysis helped us reveal the weaknesses of the unit, helping the team create an intervention (See Appendix F).

**Intervention**

A QI intervention’s purpose is to increase the chances that the unit provides improved, optimal clinical quality care. In this case, it involves identifying septic patients in a timely manner, rolling out the sepsis workflow diligently so that the ED staff, including nurses and physicians, may begin to treat and stabilize the patient, and communicating among the interdisciplinary team using effective two-way communication. Based on the gap analysis, nurse education of the sepsis workflow protocol will increase sepsis order set compliance rates, helping to improve clinical quality care in the ED.

The creation of a PowerPoint presentation was executed, explaining the need to improve timely sepsis care within the unit (See Appendix G). It begins by learning how to identify sepsis using the SIRS criteria. The SIRS criteria include: a body temperature between >38.3\(^\circ\)C or <36\(^\circ\)C, heart rate (HR) >90 beats/min, respiratory rate (RR) >20 breaths/min, a white blood cell (WBC) >12k or < 4k, blood glucose >140 (non-diabetic), and a change in mentation. Meeting any two of these criteria will fulfill the SIRS criteria (Gavelli et al., 2021). The next criteria that must be met is having an infection, or possible sign of infection including: fever, chills, rigors, weakness, cough, sore throat, shortness of breath (SOB), nasal congestion, burning/painful/increased urination, red/sore/swollen skin, abdominal pain, diarrhea, and vomiting (Gavelli et al., 2021).
Next, we revealed the compliance rates for the microsystem using data from the last quarter of 2022 and the first quarter of 2023. The unit’s compliance goal is to be above 90% in all categories. The three categories include: first vital to lactic acid result within 60 minutes, lactic acid result to antibiotic administration within 60 minutes, and antibiotic order administration within 35 minutes. The only time the unit met desired compliance in the last quarter of 2022 was in October with the first vital to lactic acid result within 60 minutes and antibiotic order to administration within 35 minutes. Then again in November, with lactic acid result to antibiotic administration within 60 minutes. Compliance rates were met in the first quarter of 2023 only for lactic acid result to antibiotic administration within 60 minutes, for the entirety of Q1. This data is important to educate staff on because it illuminates the gaps in compliance, and the areas in which improvement is needed.

The next slide is an overview of the gap analysis. The slide after lists the current best practices to early sepsis identification and proper management including: screening patients with a sepsis screening tool, identifying physiological triggers, implementing the sepsis resuscitation bundles, and applying the bundle during the third and sixth hour of the sepsis bundle protocol.

The next slide teaches staff how to advocate for patients. Such advocation includes improved communication between the interdisciplinary team. The recommended next steps include: evaluating the Q2 data of 2023, educating new staff on the sepsis protocol, in-services to periodically evaluate sepsis competency, continue to improve communication gaps, and promoting the need to ask for help when needed.

**Process Map**
A process map is a planning and management tool that outlines the individual steps, the work flow, to visualize the flow of work within a project. Also called a flow chart, it includes who and what is in the project, helping to address any gaps that may be detrimental to the project (See Appendix H).

With this QI project, the process begins with creating a gap survey to be reviewed by the sepsis coordinator and nurse manager. After their feedback, the survey can be revised then distributed to the nursing staff. Collection of the surveys is next, revealing the need for sepsis re-education based on the responses. With that goal in mind, the team decided to make a PowerPoint presentation with voiceover for the purpose of using it as an educational tool. Analysis of the sepsis fallout and compliance metrics of Q4 of 2022 and Q1 of 2023 helped us identify themes for re-education as well. After feedback from the sepsis coordinator and nurse manager, the team distributed the video presentation to the nursing staff.

The team created a QI poster to be pinned to the bulletin board in the unit to serve as a visual reminder of the sepsis QI project and its importance to the unit. Looking forward, collection and analysis of sepsis data would be needed for Q2 of 2023. If compliance goals are met, continue with providing support to the nursing staff. If goals are not met, the team must re-evaluate the PDSA cycle and make the appropriate changes (See Appendix G).

**Study of Intervention**

The study of intervention is based on analyzing and comparing the pre-intervention sepsis compliance fallout metrics to the future pose-intervention sepsis fallout compliance metrics from the same Northern California based San Francisco acute-care hospital’s ED. Since the team was not able to collect post-intervention results due to time constraints, the QI project’s aim is to
reach target compliance rates of 90% or above for any of the three categories that didn’t reach compliance before the intervention. Again, the metrics involved are: *first vital to lactic acid result within 60 minutes, lactic acid result to antibiotic administration within 60 minutes*, and *antibiotic order administration within 35 minutes*.

**Measures**

The QI team used the Plan-Do-Study-Act (PDSA) method to measure the results and effectiveness of the project. The unique characteristic of this method is that it is like trial and error. It involves changing the independent variable to influence a change in the dependent variable. The first step in the PDSA cycle asks what is the team trying to accomplish, then asks how they will know if a change is an improvement, then lastly asks what changes can be made that will result in improvement. After implementing it on a small sample size, the results can be analyzed to either realize a success or continue to make more adjustments until the final result matches the goal of the team. It is an ongoing process that is always changing because of the constantly evolving environment.

The planning involved performing a microsystem assessment, with an emphasis on the Five Ps, purpose, patients, professionals, processes, and patterns. It involved gathering information using a gap analysis to realize the weaknesses of the nurses in the unit, and gathering sepsis fallout compliance metrics. The team was able to hypothesize, with the help of EBP literature, that sepsis education would increase sepsis compliance rates and decrease fallouts.

The doing involved an intervention that was based on sepsis education. We created a PowerPoint presentation, handouts, and a poster as educational tools to help raise sepsis competency and improve communication among the nursing staff. The study phase involves
analyzing the new data for the following quarter, Q2 2023. Comparison between the previous two quarters and the quarter occurring after the intervention are analyzed to show the amount of change, preferably a decrease in the sepsis compliance fallout rate and an increase in the sepsis bundle compliance rates.

After the analysis of the intervention, the team must decide whether the intervention was beneficial or detrimental to the specific aim of the project. Were the changes the team was looking for realized? Does the PDSA cycle need to be repeated in order to get better results? The PDSA cycle is on-going. The environment is always changing. The PDSA cycle should be a tool that is used often to help strategically make processes more efficient.

**Ethical Considerations**

This project has been approved as a QI project by faculty using QI review guidelines and does not require Institutional Review Board (IRB) approval. According to the American Nurse Association Code Of Ethics (ANA COE), Provision 2.3, collaboration is the fundamental skill this QI project requires. Collaboration involves: mutual respect, two-way communication, and transparency. Without collaboration, a team will not function effectively.

**Section IV: Results**
Because of the time constraints of the project, we were not able to collect post-intervention data. Because of this, the team’s success will be determined by increased sepsis bundle compliance for Q2 of 2023. The team has set a goal of 90% compliance or over in any sepsis bundle category for the Q2 of 2023.

The team encountered several barriers and obstacles that spanned the length of the project. The first one occurred after the gap analysis was complete. We had a 23% response rate from the pre-intervention surveys, only eight of the 35 nurses on the unit completed the survey. We were hoping for more responses but we had a deadline and had to continue with the project. Survey responses from the PM and NOC shift were lacking.

Two-way communication is essential among the QI team. Sometimes, it felt like communication was lacking, but not often. The team communicates through a group chat and getting a consensus on project related tasks sometimes is difficult. Sometimes a question would be asked and no one would answer. For the most part, the team communicates effectively.

Some nurses were set in their usual work patterns, before, during, and after the intervention. A select few had a bad attitude and did not want to learn material or be re-educated by a nursing student. We were unable to do a post-intervention survey due to a lack of time left remaining in the semester. Because of this, Q2 2023 compliance rates will be compared to the two previous quarters in order to measure success or failure of the intervention. The project spanned the course of one semester, roughly 16 weeks.

Section V: Discussion
Summary

The key findings of this project reveal that sepsis compliance education gives nurses more confidence in doing their job. The new nurses, especially, will understand the dangers of sepsis and understand it must be treated in a timely manner. The microsystem assessment, along with the gap analysis, and direct observation was primarily the foundation of the project. Fallouts in the sepsis order set include: short staffing, lack of effective two-way communication, poor work ethic, and not using the sepsis screen.

Order set usage among the RN staff at the hospital averages a 33% compliance rate between March 2022 and February 2023, pre-intervention. Compared to the other two sister hospitals in San Francisco, the nurses at our hospital ranked number two with the highest compliance. The three hospitals combined had an average compliance rate of 30% (See Appendix I)

The physicians averaged a 38% compliance rate, ranked number two out of three for highest compliance rates among the other two sister hospitals. The mean compliance rate over the year was 40%, an average compliance rate consisting of all three hospitals, pre-intervention (See Appendix J)

A report created before the intervention listed opportunities for improvement pertaining to the SEP-1 bundle compliance. Such metrics include fluid administration, antibiotic administration, and blood cultures. Common fallouts were that fluids were ordered less than required, were ordered but never administered, or administered late. Repeat lactate was ordered but drawn late, ordered late, or not drawn at all. Sometimes antibiotics would be administered
before the first set of blood cultures were collected. Blood cultures were often ordered late, or not ordered at all (See Appendix K).

**Conclusion**

Characteristics that contributed to the successful change includes a strong QI team that works well with one another. The team consisted of seven team members. Everyone collaborated well together and the dialogue was always productive and non-intimidating.

This QI project is considered a success because early sepsis recognition, effective two-way communication and diligent use of the order sets will decrease the mortality rate as well as increase compliance rates. The QI project was centered around evidence-based practice (EBP) and currently, sepsis education decreases sepsis bundle fallout and creates a more efficient microsystem.
Section VI: References


Alexander, M., Sydney, M., Gotlib, A., Knuth, M., Santiago-Rivera, O., & Butki, N. (2022). Improving Compliance with the CMS SEP-1 Sepsis Bundle at a Community-Based Teaching Hospital Emergency Department. *Spartan Medical Research Journal, 7*(2), 37707. [https://doi.org/10.51894/001c.37707](https://doi.org/10.51894/001c.37707)


Appendix A.

Sepsis Protocol For Positive Sepsis Screen
## CPMC Sepsis Protocol for Positive Sepsis Screen

<table>
<thead>
<tr>
<th>Task #</th>
<th>Responsible Operator</th>
<th>Task Description (Include handoffs &amp; all signs FROM, other staff, to complete task)</th>
<th>Task Cycle Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ED Triage Nurse</td>
<td>1. Triage patient per “ED Triage Standard Work” and identifies patient through positive sepsis screen&lt;br&gt;2. Notify Charge RN of Positive Sepsis Screen, let Charge RN know if patient is PUI&lt;br&gt;3. Document evaluation in “RN Sepsis Flowsheet”&lt;br&gt;4. Initial RN “Suspected Sepsis in Triage Standardized Procedures [7740]” in EPIC (type “Sepsis” in search bar), scroll to bottom, click “Log”</td>
<td>5 min</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Charge RN</td>
<td>1. Identify room number and calls ED Sepsis Alert&lt;br&gt;• VMCN/RC Voice: Push button and say “Broadcast to ED” + “sepsis alert, room number” → local broadcast in ED&lt;br&gt;• DAV Dial “24444” for the Operator: Inform operator to overhead “sepsis alert, room number” → local broadcast in ED</td>
<td>1 min</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Triage Tech/ED Triage RN</td>
<td>1. Room Patient:</td>
<td>1 min</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>ED Sepsis Alert&lt;br&gt;Response Team</td>
<td>1. Respond to Sepsis Alert (Response Team includes the following):&lt;br&gt;• MD&lt;br&gt;• Primary RN&lt;br&gt;• Pharmacist (only 24-h service at VHC, if patient is PUI, Pharmacy will not enter the room)&lt;br&gt;• RN Tech (if available)&lt;br&gt;• 2nd RN (if available)</td>
<td>4 min</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>MD</td>
<td>1. Evaluate patient, determine need for antibiotics and fluids.&lt;br&gt;2. Use the MD Orders: ED SIRS Suspected Sepsis [1022] or ED Septic Shock [1045], as appropriate.&lt;br&gt;3. • If patient has a non-infectious process, document/confirm that “sepsis diagnosis ruled out”, i.e., cardiogenic shock, renal failure.</td>
<td>15 min</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>ED Primary Nurse</td>
<td>1. Follow “Suspected Sepsis in Triage Standardized Procedures [7740]”, concurrent with MD Evaluation and order:&lt;br&gt;• Establish IV x 2&lt;br&gt;• Draw labs (blood culture, chem panel)&lt;br&gt;• Administer f/t Lactate Roger bolus</td>
<td>4 min</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>ED Primary Nurse</td>
<td>1. Run the lactate in the Point of Care Testing device if available and notify MD of results verbally.&lt;br&gt;2. Confirm that there is a 3-hour repeat order for lactate, if the initial result is greater than 1.9.&lt;br&gt;3. • If no order, contact the MD for an order, and document the following in EPIC Nursing Note:&lt;br&gt;• MD notified (name)&lt;br&gt;• Time MD notified</td>
<td>4 min</td>
<td></td>
</tr>
</tbody>
</table>

### Appendix B.

Sepsis Compliance/Fallout Rates For Q4 2022
First Vital to Lactic Acid Result within 60 minutes

Lactic Acid Result to Antibiotic Administration within 60 minutes

<table>
<thead>
<tr>
<th>Month</th>
<th>First Vital to Lactic Acid Result within 60 min</th>
<th>Lactic Acid Result to Antibiotic Administration within 60 minutes</th>
<th>Antibiotic Order to Administration Within 35 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>100%</td>
<td>86%</td>
<td>100%</td>
</tr>
<tr>
<td>November</td>
<td>60%</td>
<td>90%</td>
<td>70%</td>
</tr>
<tr>
<td>December</td>
<td>71%</td>
<td>85%</td>
<td>75%</td>
</tr>
</tbody>
</table>

Appendix C.

Sepsis Compliance/Fallout Rates For Q1 2023
Appendix D.

SWOT Analysis
### Appendix E.

**Cost-Benefit Analysis**

<table>
<thead>
<tr>
<th>Internal</th>
<th>Favorable/Helpful</th>
<th>Unfavorable/Harmful</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Strengths</strong></td>
<td><strong>Weaknesses</strong></td>
</tr>
<tr>
<td></td>
<td>• Sepsis quality improvement team</td>
<td>• Lack of awareness from the nursing staff to identify necessary changes in sepsis prevention.</td>
</tr>
<tr>
<td></td>
<td>• Collaborative participation from the ED sepsis coordinator and manager</td>
<td>• Lack of emphasis and reinforcement for standardized practices.</td>
</tr>
<tr>
<td></td>
<td>• Hospital Quality Dashboard in place that tracks rates of Sepsis in the ED and select wards, comparing them to CA and USA averages.</td>
<td>• Poor Physician support of current best practices (incorrect bundle order sets)</td>
</tr>
<tr>
<td>External</td>
<td><strong>Opportunities</strong></td>
<td><strong>Threats</strong></td>
</tr>
<tr>
<td></td>
<td>• Reduce the risk of Sepsis</td>
<td>• Lack of education retention of proposed changes among staff</td>
</tr>
<tr>
<td></td>
<td>• Improvement of patient care and safety</td>
<td>• Limited time, staff, and resources to conduct change.</td>
</tr>
<tr>
<td></td>
<td>• A hospital-wide commitment to quality improvement</td>
<td>• Fast-paced busy ED workflow that may interrupt bundle administration times.</td>
</tr>
<tr>
<td></td>
<td>• Tracking metrics on quality improvement indicators</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Evidence-based practice on Sepsis reduction, patient and nurse education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sepsis</td>
<td>Severe Sepsis</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------</td>
<td>---------------</td>
</tr>
<tr>
<td><strong>Cost per case</strong></td>
<td>$16,324</td>
<td>$24,638</td>
</tr>
<tr>
<td><strong>Total savings per</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>case</strong></td>
<td>$2,940</td>
<td>$4,787</td>
</tr>
<tr>
<td><strong>Cost of Implementing</strong></td>
<td>staff training expense</td>
<td>staff training expense</td>
</tr>
<tr>
<td><strong>this project</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net savings</strong></td>
<td>$2,940-staff training expense</td>
<td>$4,787-staff training expense</td>
</tr>
</tbody>
</table>

**Appendix F.**

Gap analysis
4. How many years have you been an RN?

- More than 20 years
- 10 to 19 years
- 5 to 9 years
- 1 to 4 years
- Less than 1 year

5. Please rate your expertise of sepsis.

Average Rating: 4.13

6. Please rate your knowledge of early warning signs of sepsis.

Average Rating: 4.25

7. When asking I am able to:

- Complete an order at conciseness
- Identify location appropriately
- Ask nurse after znaw report
- Ask for help when needed
- Provide timely and appropriate...

8. What is the average time it takes you to complete the sepsis screening section in one hour?

- 10 minutes
- 15-30 minutes
- More than 30 minutes
12. If you do not feel comfortable with the epics workflow, explain below.

13. I feel like improvements can be made to these protocols to decrease failures.

14. If you feel there is room for improvement, what would yours be?

15. Thank you so much for your time! Please add any other comments here.

6 responses

14. If you feel there is room for improvement, what would yours be?

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>anonymous</td>
<td>role, staffing should be better aligned with current processes.</td>
</tr>
<tr>
<td>2</td>
<td>anonymous</td>
<td>process needs to be more efficient and streamlined.</td>
</tr>
<tr>
<td>3</td>
<td>anonymous</td>
<td>clear instructions and expectations for all team members.</td>
</tr>
<tr>
<td>4</td>
<td>anonymous</td>
<td>better communication and collaboration across departments.</td>
</tr>
<tr>
<td>5</td>
<td>anonymous</td>
<td>more training and resources for staff.</td>
</tr>
</tbody>
</table>

*Off or on principle should be the standard for all staff and used in the ED*
11. Thank you so much for your time! Please add any other comments here!

ID | Name | Response
---|------|---------
1 | anonymous | The dot phase does not get violated during usage. It just entered hours later after the entire usage is completed. Also, the setup screening takes about 30-60 seconds, 20-30 minutes, and likely longer than 1 minute. It should never take longer than 2 minutes, so complete the setup in less than 2 minutes. There are also many other documentation points for setup, so we've included in the survey that isn’t
2 | anonymous | US users only should be the only fluid dechlorinated used in the ED.

Response: "Or plan/liner should be the standard fluid dechlorinated used in the ED."

5. Based on your knowledge of sepsis, how confident do you feel in running the sepsis workflow?

- Score: 4.13
  - Average Rating

10. Do you feel supported by the team when using the sepsis workflow?

- Score: 4.00
  - Average Rating
Appendix G.

PowerPoint Presentation

Improving Timely Sepsis Care through Staff Education Within the Emergency Department

Jillian Abinader RN, Leman Bush RN, Kaylee Castro RN, Shirley Chen RN, Spencer Forest RN, Lian Radcliffe RN, and Gregory Trevino RN

Identifying Sepsis

Sepsis: ≥ 2 SIRS criteria + known or suspected infection

Systemic Inflammatory Response Syndrome

- Temperature >38.3°C or <36°C
- Heart Rate >90 beats/min
- Respiratory Rate >20 breaths/min
- White Cell Count >12k or <4k
- Blood Glucose >140 and non-diabetic
- Change in mentation

Possible Signs & Symptoms of Infections

- Fever/Chills/Rigors/Weakness
- Change in cough/New cough
- Sore throat/New mouth sore
- SOB/Nasal congestion/Stiff neck
- Burning/Pain/Increased in Urination
- Redness/Soreness/Swelling on skin
- Diarrhea/Vomiting/Pain in the abdomen
**CPMC Mission Bernal Data**

How has the microsystem been doing?

**Last Quarter of 2022 at a Glimpse**

<table>
<thead>
<tr>
<th></th>
<th>First Vital to Lactic Acid Result within 60 min</th>
<th>Lactic Acid Result to Antibiotic Administration within 60 minutes</th>
<th>Antibiotic Order to Administration Within 35 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>100%</td>
<td>86%</td>
<td>100%</td>
</tr>
<tr>
<td>November</td>
<td>60%</td>
<td>90%</td>
<td>70%</td>
</tr>
<tr>
<td>December</td>
<td>71%</td>
<td>85%</td>
<td>75%</td>
</tr>
</tbody>
</table>

**First Quarter of 2023 at a Glimpse**

<table>
<thead>
<tr>
<th></th>
<th>First Vital to Lactic Acid Result within 60 min</th>
<th>Lactic Acid Result to Antibiotic Administration within 60 minutes</th>
<th>Antibiotic Order to Administration Within 35 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>99%</td>
<td>94%</td>
<td>83%</td>
</tr>
<tr>
<td>February</td>
<td>60%</td>
<td>92%</td>
<td>77%</td>
</tr>
<tr>
<td>March</td>
<td>68%</td>
<td>100%</td>
<td>57%</td>
</tr>
</tbody>
</table>

**Survey Summary**

- 23% response rate (n = 8): (5 AM shift, 5 part-time/full-time)
- 0 response from travelers or night shift

**Years of RN experience**

<table>
<thead>
<tr>
<th>Years of Experience</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;1 year</td>
<td>1</td>
</tr>
<tr>
<td>1-4 years</td>
<td>1</td>
</tr>
<tr>
<td>5-10 years</td>
<td>4</td>
</tr>
<tr>
<td>10+ years</td>
<td>2</td>
</tr>
</tbody>
</table>

**Expertise of Sepsis & Confidence in Running the Sepsis Workflow**

- Not confident
- Partially confident
- Fully confident

**Knowledge in Early Warning Signs of Sepsis**

- Not confident
- Partially confident
- Fully confident

**Barriers:**
- **★** MD-RN Communication
- **★** Hard sticks
- **★** Staffing

**Can improvements to the Sepsis protocol decrease fallouts?**
- Average rating of 2.88/5
Current Best Practices

1. **Screen** patients for sepsis using a **screening tool** within the electronic health record system.

2. **Identify** patients quickly using a standardized set of **physiological triggers** including: sweating, abnormal temperature, rigors, confusion, tachycardia, tachypnea.

3. **Implement** sepsis resuscitation **bundle**: obtain blood cultures, administer antibiotics, measure serum lactate, manage fluid status for hypotension (fluid shifting) and lactate greater than or equal to 4 mmol/L all within the first 3 hours of sepsis diagnosis.

4. **Apply** sepsis bundle during the **3hr phase and 6hr phase**. All elements to be completed within the **6hr timeframe**.

---

First Vitals to Lactic Acid Results Within 60 Minutes

- **Q4 2022- 1st Vitals to Lactic Acid Results Within 60 Minutes**
- **Q1 2023- 1st Vitals to Lactic Acid Results Within 60 Minutes**

![Graphs showing first vitals to lactic acid results within 60 minutes for Q4 2022 and Q1 2023.](image)
Antibiotic Order to Administration Within 35 Minutes

![Graphs showing percentage of antibiotic orders administered within 35 minutes for Q4 2022 and Q1 2023.]

Advocating for Patients

- Improving MD-RN communication was identified as a major goal to achieving timely sepsis care
- 50% of survey respondents cited MD-RN communication gaps as reasons for why sepsis workflow milestones were not being met

Survey Open Responses:
- [Survey responses]

Standardized Communication
- Scripting to ensure team alignment
- 24/7 communication with the ICU
- MD-RN communication with pathway in place
- Time zero and reassessment time

- One study by Simon et al. (2020) implemented scripted communication tools as part of a coordinated response team effort to improve time to sepsis treatment
- Clear MD-RN communication regarding "best practice alert fire and pathway selection was noted in 88% of observations after implementation"

*Best Practice Alert:*
Utilizes clinical data available in Epic to provide real-time alerts to providers and nurses about the possibility of sepsis
Recommended Next Steps

- Evaluate Q2 2023 data
- Educate new staff on the sepsis protocol
- Periodically continue to educate staff about sepsis and the sepsis protocol, as well as annual competency
- Continue to improve communication regarding sepsis
- Keep up the great work screening every patient and enacting the sepsis bundle rapidly
- Ask for help when needed

Thank You!
References


Appendix H.

Process Map

Create a Gap survey

Submit the Gap survey to the sepsis coordinator and manager for feedback

Revise the Gap survey based on feedbacks

Distribute the Gap survey to the nursing staff

Collect and analyze the Gap survey

Identify themes for re-education from the Gap survey

Update the bulletin board with a poster of this QI project

Distribute the video presentation to the nursing staff

Submit the video presentation for feedbacks

Record a voice over of the PowerPoint for a video presentation

Create a PowerPoint presentation

Identify the themes for re-education from the Sepsis Compliance and Fallout metrics

Collect and analyze the Sepsis data from the second quarter of 2023

If the goals are met, then continue to provide support to nursing staff

If the goals are not met, need to reevaluate the PDCA cycle and make appropriate changes

Analyze the Sepsis Compliance and Fallout metric of 4Q2022 and 1Q2023
Appendix I.

RN Standardized Procedure Order Set Usage
Appendix J.

Physician Sepsis Order Set Usage
Appendix K.

SEP-1 Opportunities For Improvement Cases

<table>
<thead>
<tr>
<th>Location of OFI:</th>
<th>81.1% ED and 25.7% non-ED (note: transfer cases are attributed to both ED/non-ED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall:</td>
<td>ED Fluids: 92.6% fluids ordered less than required, MD order set not used, and/or dot phrase not used. 7.4% ordered but adm late, ordered not given</td>
</tr>
<tr>
<td></td>
<td>ED Repeat Lactate: 61.5% ordered but drawn late 38.5% ordered late or not ordered</td>
</tr>
<tr>
<td></td>
<td>ED Antibiotics: ordered late or not ordered</td>
</tr>
<tr>
<td></td>
<td>ED Blood Culture: 75% ordered late or not ordered 25% drawn after antibiotics</td>
</tr>
<tr>
<td></td>
<td>ED Repeat Lactate: 75% ordered late or not ordered 25% drawn after antibiotics</td>
</tr>
<tr>
<td>ED:</td>
<td>Fluids 45.0% repeat lactate 21.7% antibiotics 20.0% blood culture 11.3% initial lactate 9.6% pressures 1.7% reassessment</td>
</tr>
<tr>
<td>Non-ED:</td>
<td>Fluids 47.4% blood culture 10.5% repeat lactate 5.3% antibiotics 5.3% initial lactate 5.3% pressures</td>
</tr>
</tbody>
</table>

Total of 74 OFI Cases Reviewed since April 2022.