

Sepsis Care and Sepsis Management

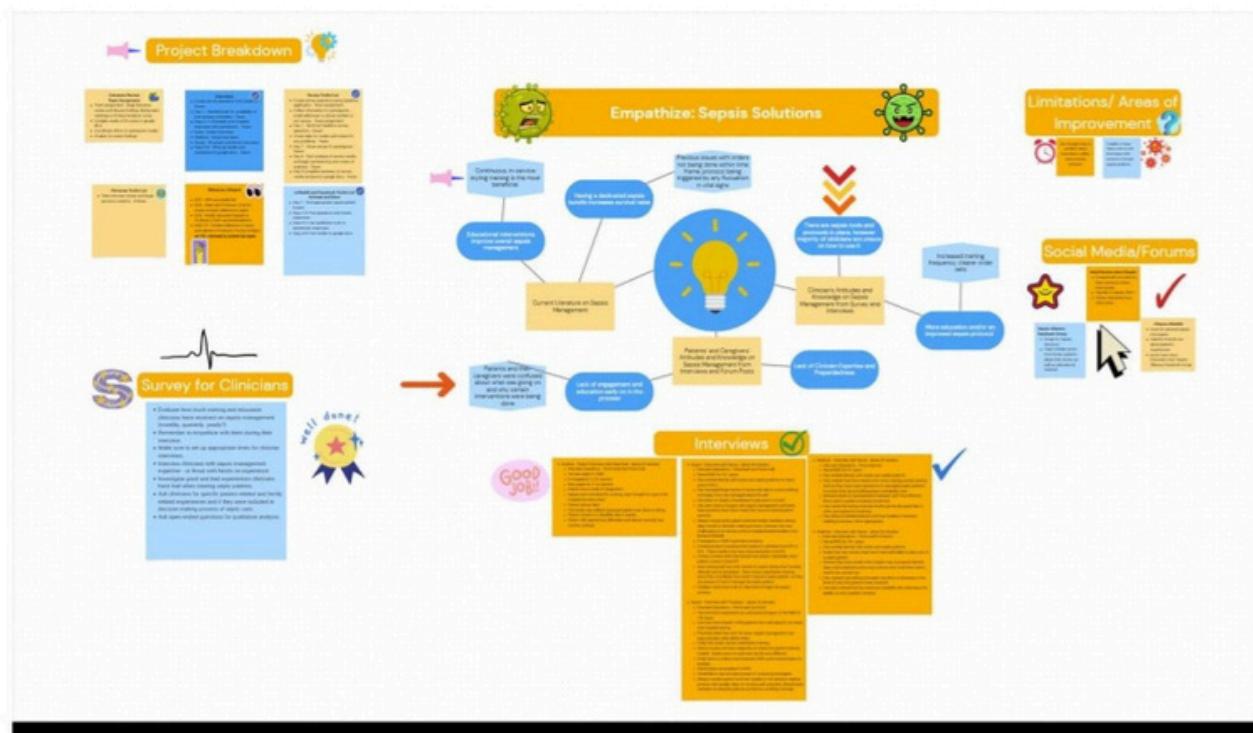
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I.) Planning and Collaboration

Breakdown of tasks, collection of data and ideas, and organization of findings were documented through a Canva whiteboard. First tasks for needs assessment were divided amongst group members. Two members conducted a literature review, two were responsible for data collection from forums and social media, and each group member was responsible for conducting as many interviews as possible with a goal of at least four interviews. Two group members also worked together to develop a survey that would be distributed to clinicians. Findings from the survey, literature review, and forums were posted on the whiteboard for everyone to review. Members also posted any limitations they faced with their respective tasks.



II.) Literature Review

Sepsis Overview

Sepsis protocol and sepsis management have been scrutinized for decades. While protocols and sepsis alert management have been altered and improved over the past few years, there can still be room for improvement, especially with the current technological advancements within society. According to the Centers for Disease Control and Prevention (CDC, 2022), sepsis is a critical medical condition that is characterized by systemic inflammation in the body due to infection (CDC, 2022). Mortality has been estimated to be from 10-40%, depending on whether septic shock is present (Schmidt & Mandel, 2023). In 2019 alone, 201,092 people died of sepsis in the United States, and three-fourths of those deaths were among people aged 65 and over (CDC, 2021). Additionally, the cost of sepsis management runs into the billions (Paoli et al., 2018). As such, sepsis has a wide scope and is a critical problem for the healthcare community.

Sepsis has varying scales of severity, from mild sepsis up to septic shock. Common signs of sepsis include fever, increased heart rate, sweating, confusion or mental disorientation, low blood pressure, difficulty breathing, fatigue, extreme pain or discomfort, and chills. Within the patient's blood work, sepsis can be potentially seen through decreased platelet count, increased white blood cell count, increased lactate levels, and through bacterial or viral infections (CDC, 2022). Sepsis can lead to septic shock if the patient is not cared for quickly enough, and/or if the infection spreads quickly. Severe sepsis is when the organs begin to malfunction and/or start to shut down. Septic shock is the most severe form of sepsis and is life-threatening. Septic shock includes the symptoms of dizziness, confusion, cyanosis of lips or fingers and

toes, chills, difficulty breathing and/or hyperventilation, decreased output of urine, pale and cool to the touch arms and legs, and fever or hypoglycemia (Cleveland Clinic, 2022). Patients have the potential to survive septic shock, if action is taken immediately, otherwise, the chance of survival is low.

Patients who are over the age of 65, infants less than 1 year old, patients who had recent hospitalization, patients who have a history of sepsis, and patients with chronic conditions are more susceptible to developing sepsis. Sepsis affects patients regardless of gender, race, and age and has a wide patient population (CDC, 2021). For purposes of this project, our target users consist of the adult population in an acute care setting.

Hospitals and facilities oftentimes recognize that sepsis and septic shock need immediate medical intervention, yet the ability to do so can be difficult, especially when there are hundreds of patients that need care. Proper sepsis management can help to make the process smoother for providing urgent medical care for signs of sepsis.

Current Sepsis Management

Current sepsis management protocols can vary from hospital to hospital, but many contain the same themes and concepts. Two examples of current management protocols implemented are sepsis bundles and better education on sepsis.

Sepsis bundles are a grouping of tests needed to be conducted immediately, in order to gauge the severity of the patient's complications, and/or if sepsis is present, as well as what the severity of sepsis is. The Surviving Sepsis Campaign (SSC) introduced an hour-1 bundle, which measures lactate levels, orders blood cultures to be drawn,

prior to the administration of antibiotics, and then after those lab draws are completed, to administer broad-spectrum antibiotics, to begin rapid administration of 30ml/kg crystalloid for hypertension or lactate greater than or equal to 4 mmol/L, and to apply vasopressors if the patient shows signs of hypotension during or after the resuscitation of fluids, in order to maintain MAP greater than or equal to 65 mm Hg (Levy et al., 2018). The hour-1 notation is so that the labs are to be drawn and action is to be taken within the first hour of the patient being there, starting from time of triage. It is noted that while the entire process may take over an hour to be completed, it is important that the steps are taken, such as administering the IV fluids, within that first hour. Some pitfalls and limitations with the sepsis bundles are that it should be timed when lab work is able to be performed, however, if there is any interruption in that time, the bundle can not be completed with the time constraints. An example is if a patient needs to go for an X-ray at the same time lab work needs to be performed, then the bundle is no longer able to be completed timely. It also does not take into consideration other reasons for vital sign changes such as when temperature changes when a patient is going through drug and alcohol withdrawal. During this time, patients' vitals are very erratic due to the withdrawal. The bundle was introduced and revised (to the version discussed) to provide support for hospital staff. The implementation of the bundle to the rate of sepsis survival strongly correlates, from evidence provided by New York State (NYS) Department of Health and Centers for Medicare and Medicaid Services (CMS). The results were measured via the National Quality Forum (NQF), per mandated public reporting (Levy et al., 2018).

A second existing application for better sepsis management is improving sepsis education among clinicians. Nakiganda et al. (2022) evaluated sepsis guidelines and looked at the effect of better sepsis education on patient management among nurses in an acute care setting. Educational tools the researchers used in the experimental design included presentation sessions, videos, case studies, and questionnaires. The results of the study found that educational intervention significantly improved nurses' knowledge and the quality of care within the sepsis patient population (Nakiganda et al., 2022). Furthermore, their findings were also supported by outside research where other researchers found the impact of educational intervention improved sepsis management (Nakiganda et al., 2022). One limitation of the study was that the education provided was a one-time opportunity, but the researchers noted that it was important to have continuous inservice training for nurses to have significant positive outcomes for sepsis patients. In the end, the researchers concluded that regular continuous professional nursing education on sepsis was needed to significantly improve patient outcomes.

III.) Primary Data Collection

Data Collection of Interviews, Survey, and Interest Groups on Social Media

For our project, our team collected results from a 12-question survey through Qualtrics, personal interviews, and interest groups found on online forums of Facebook and Reddit. For the survey questions and interviews, the team collected data from respondents through our personal network. Subjects recruited were from acute care settings such as hospitals and inpatient rehabilitation healthcare facilities in the Philadelphia area and included clinicians, family members, and patients. For the Qualtrics survey, methods used to fill out the survey include email and text and

respondents were given one week for completion. As of June 25th, 2023, a total of 50 respondents answered the survey. Personal interviews were conducted in-person, over the phone, and through meetings online. For the personal interviews, a total of 5 interviews were conducted among the recruited subject population. This included one patient and four clinicians.

Additionally, data was collected from a total of twenty social media posts from forums and interest groups. Interest groups and forums were chosen if they were run and/or moderated by individuals that were hospitalized by sepsis, or by organizations focused on sepsis awareness or education. The Sepsis Alliance Facebook group and the Sepsis subreddit on Reddit were selected because they focused on patient's experiences with sepsis. All results from the survey, interview, and interest groups are summarized in the section below.

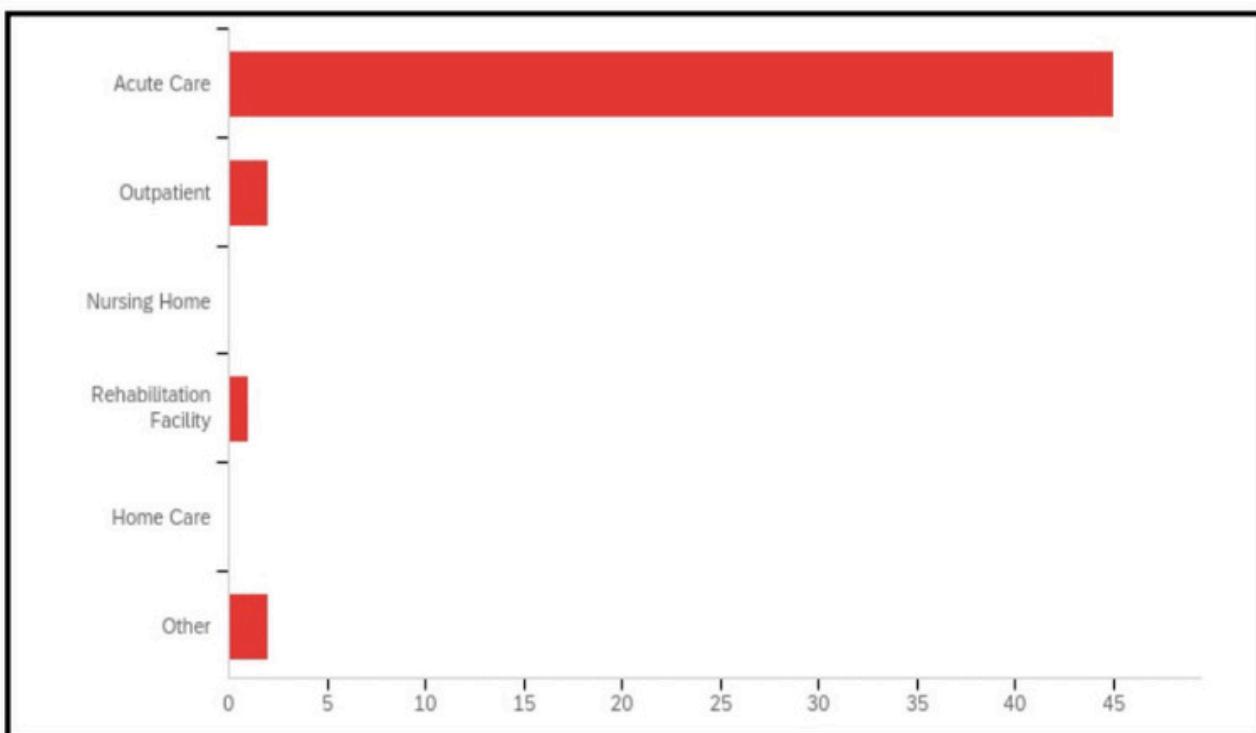
Analysis of Primary Data and Summary Findings

Results of Survey:

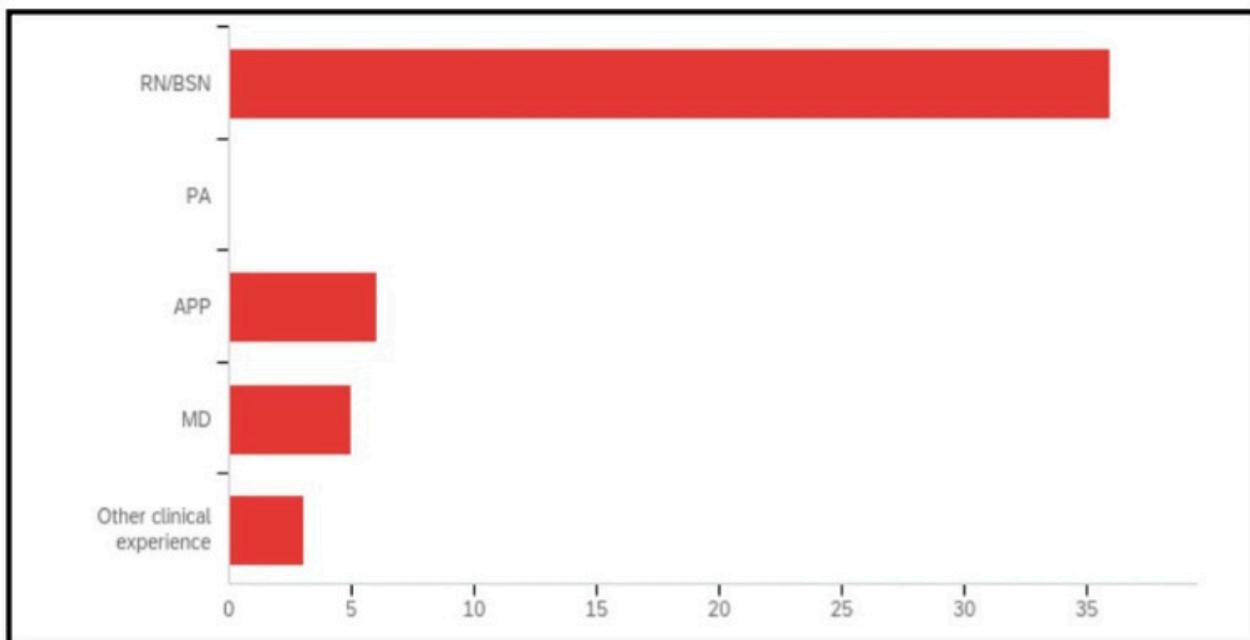
The survey consisted of the following 12 questions: place of work, current job/area of practice, receiving of sepsis training, whether a sepsis screening tool is used at their area of practice, whether the respondent was comfortable with sepsis information and management, how often training on sepsis occurs, what education do respondents have when treating sepsis, problems during sepsis management, their ideas on increasing the efficiency of sepsis management, and any additional comments. The results and findings are discussed below.

The results of the first four questions are presented below in bar charts. For place of work, 90% of respondents answered acute care. Others answered outpatient (4%), rehabilitation facility (2%), and other (4%). For current jobs and areas of practice, 72% of respondents answered nurses (RN/BSN). Additionally, there were a few who were advanced practitioners (12%), MDs (10%), and other clinical experiences (6%). Majority of respondents did receive training in the last year on sepsis with a 66% "yes" response. Furthermore, a total of 78% of respondents replied that they used a sepsis screening tool at work.

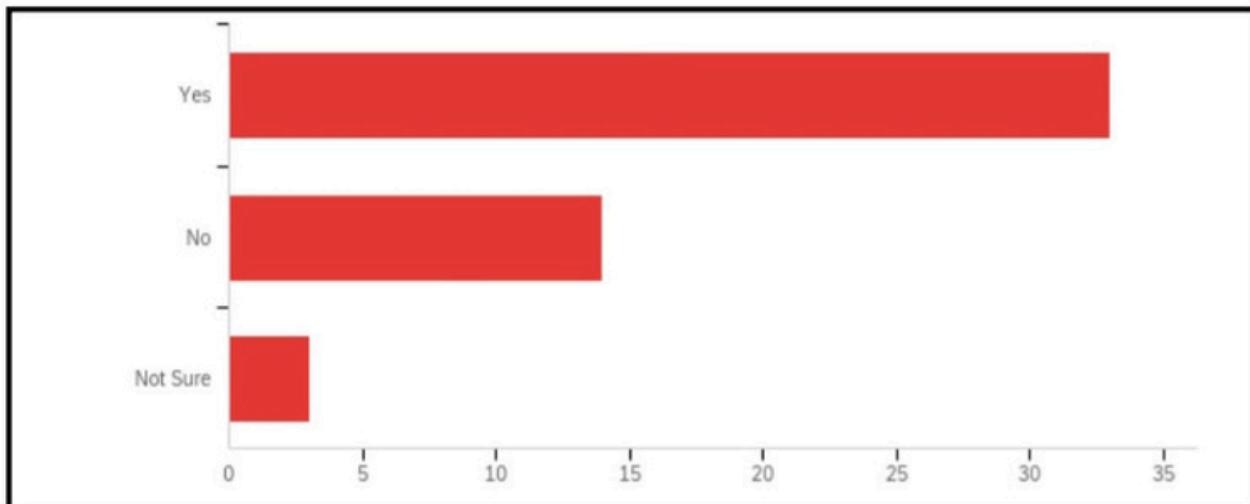
Q1. Place of Work



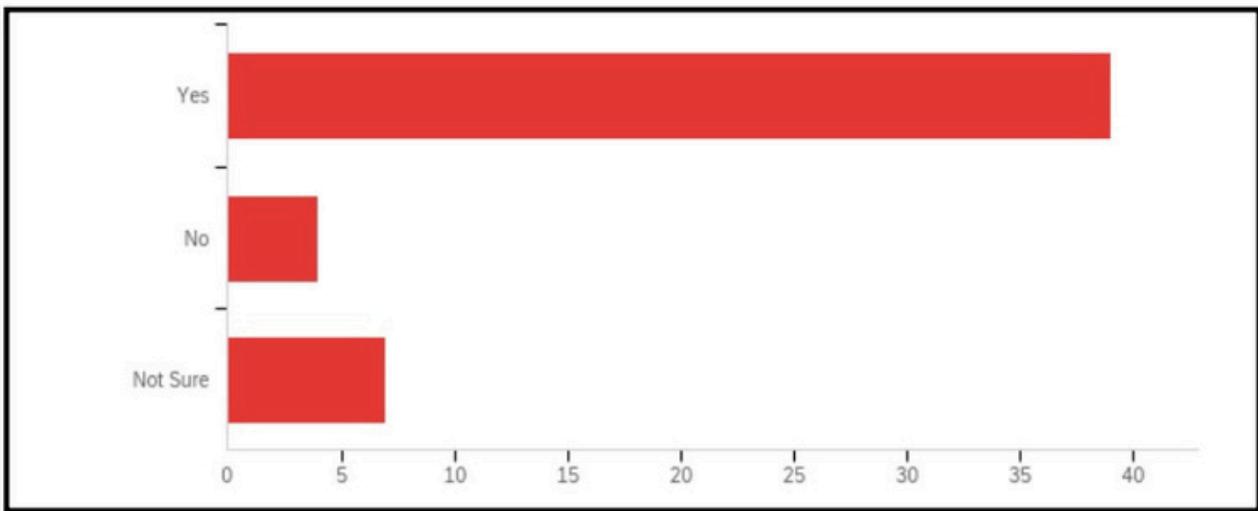
Q2. Current Job/Area of Practice



Q3. Have you received sepsis education/training in the last year?



Q4. Has a sepsis screening tool been used in the area of your practice?

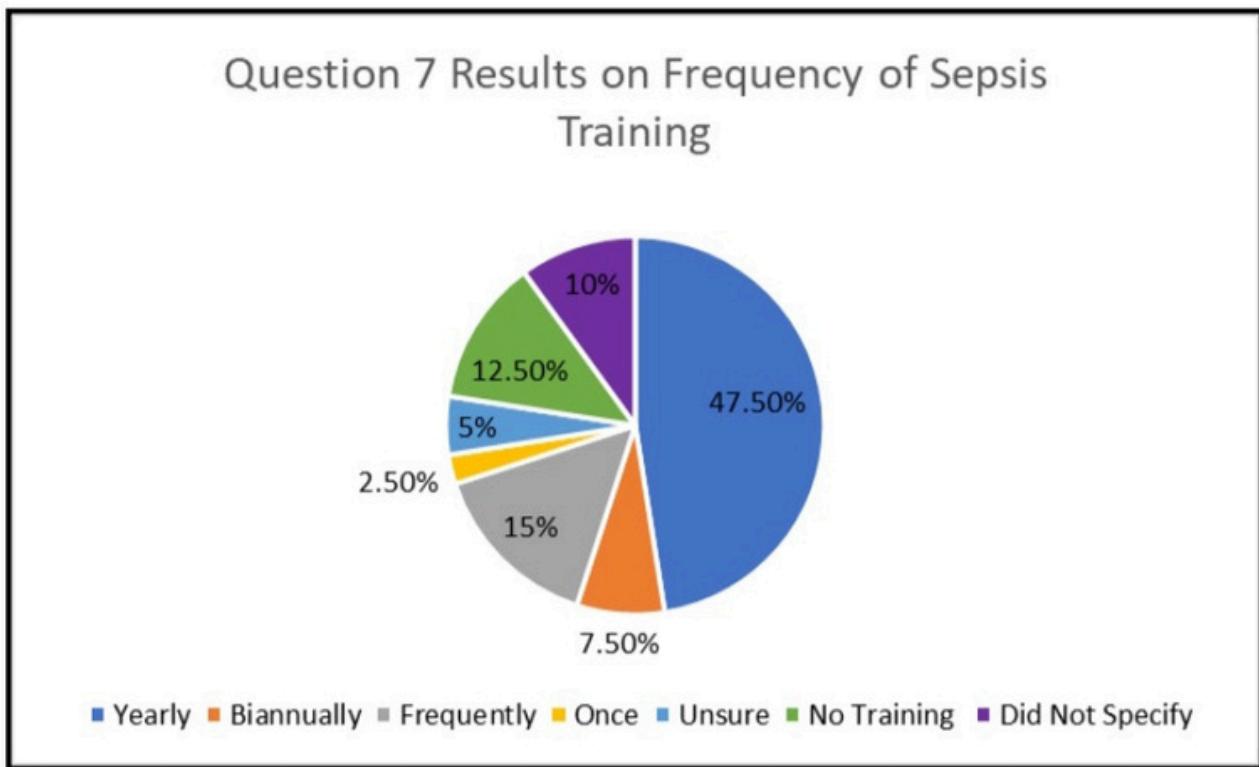


For the short answer questions, participants were encouraged to explain their answers. Again, data was obtained through Qualtrics and analyzed for themes. For Question 5 which covered whether respondents felt comfortable with sepsis information and knowledge, most replies (77.5%) felt that they were confident when handling sepsis. Most responded that this was due to education and training. However, 12.5% felt slightly comfortable, and 10% of responses stated that they were not prepared for sepsis. Respondents that felt slightly or totally unprepared for sepsis included reasoning such as the module criteria for sepsis was not always being accurate, the need for more training, the fact that different providers manage sepsis patient differently, not having confidence in themselves to identify sepsis correctly, and frequent changes in protocols for sepsis.

For Question 6, respondents were asked if they felt comfortable with sepsis treatment and management. As with Question 5, most replies were yes. For those that did not feel comfortable with sepsis treatment and management, the reasoning behind this included the same answers as for Question 5. Question 7 included information on

how often respondents get sepsis training and whether this is enough. Responses for this question can be summarized as yearly (47.5%), biannually (7.5%), frequently (15%), once when hired (2.5%), unsure (5%), no training (12.5%), did not specify (10%). This is summarized in the pie chart below. Furthermore, out of the total number of participants, 35% stated that this was not enough. Based on the survey results, some reasoning provided for why this was not enough training was that medicine was very subjective and more hands-on practice was needed.

Q7. How often do you get training on sepsis? Do you feel this is enough for sepsis training? Why or why not?

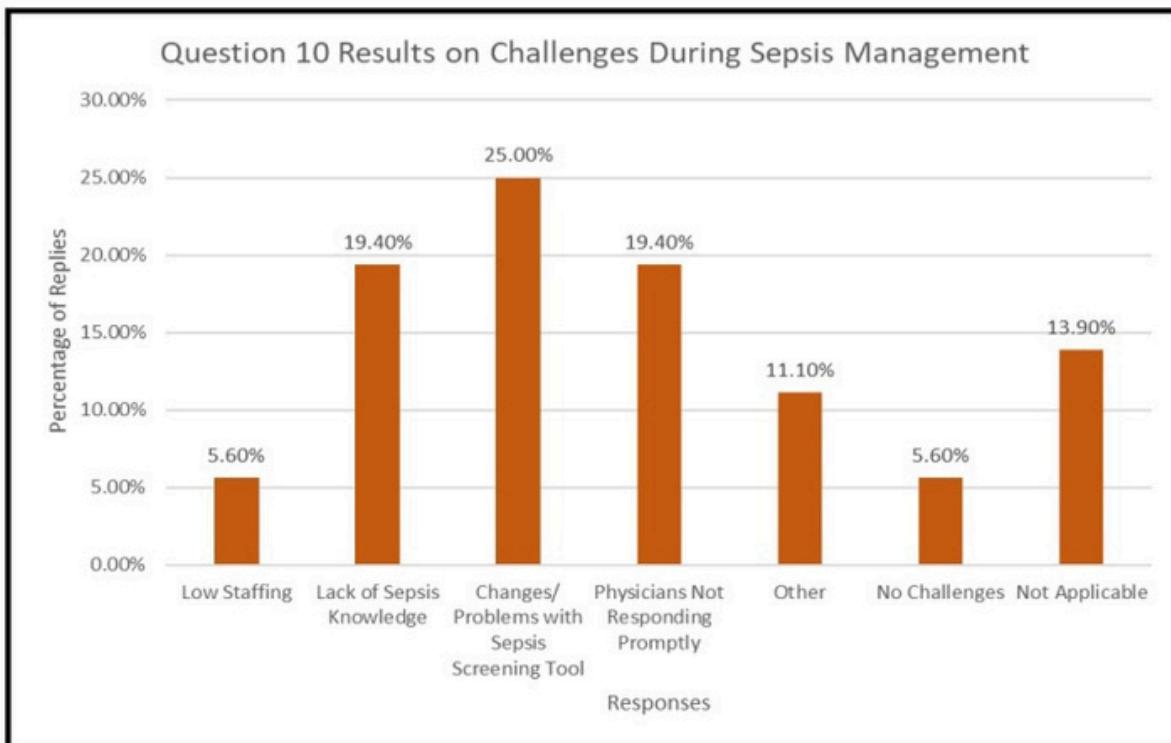


Question 8 focused on the support and education participants had when treating sepsis. Responses included alerts within the electronic health records (EPIC system

was mentioned), support through their medical/clinical teams (including nurses, nurse managers, clinical specialists, nurse educators, and other clinicians), and education provided through intranet, seminars, video modules, online pathways, and other online learning materials. Question 9 asked subjects to provide an example of a deteriorating patient due to sepsis and any actions that took place. In addition, participants were asked whether they had any problems during this time with treatment and management for sepsis. Responses included notifying providers in a timely manner in order to get labs drawn, fluids started, and monitoring of patients, acting quickly and efficiently, and following the sepsis plan/protocol. Most challenges reported by subjects focused on identifying the signs and symptoms of sepsis in a timely manner.

Question 10 further analyzed and focused on frequent challenges with sepsis management in general. Below is a bar chart summarizing the responses. Responses included staff shortages, lack of knowledge, changes in the treatment protocols, proper management of orders placed, response time from physicians, pop-up alerts being ignored within EHR, early recognition of signs of sepsis, and false alerts for sepsis. Out of all the participants, the majority felt that the biggest challenges were changes/problems with the sepsis screening tools (25%), lack of knowledge in understanding the signs of when a patient was in sepsis (19.4%), and physicians not responding promptly (19.4%). Statements that were organized under the “other” response include physicians hesitant to volume resuscitate and patients responding to treatments in different ways.

Q10 - What are some challenges you see frequently with sepsis management either personally or with other clinicians?



Some responses for Question 10 included:

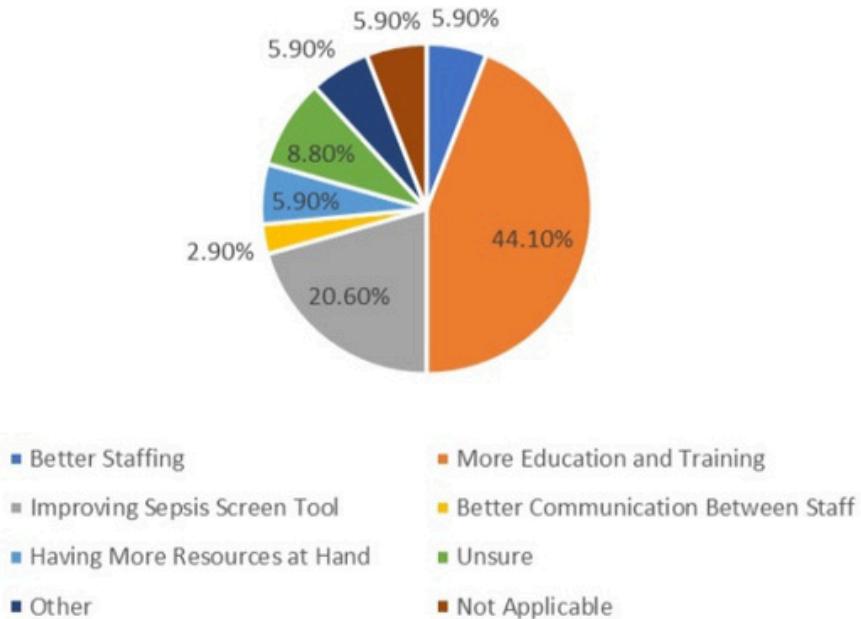
- Sometimes there are set orders that need to be put in but not everyone knows that
- A lot of people ignore the sepsis notification that pops up for patients
- Early recognition; alert system - clinical reminders based on data in EMR - flag patients with certain characteristics
- Delay in acknowledging signs of sepsis
- As I mentioned earlier the criteria isn't' alway accurate from VS
- Patients with poor compliance to medication, poor insight to health conditions, do not know what meds they are taking.
- Inconsistent treatment between teams and providers

- Patients responding to treatments in different way

Lastly, Questions 11 and 12 focused on what can improve the efficiency of sepsis management and any other comments participants would like to add. Answers for Question 11 included themes such as improvement in education and training, executing time sensitive information better, and improving EHR sepsis screening tools. This is presented in the pie chart below. Furthermore, responses for Question 12 included 16 “no” responses. Additional comments included having the patient and family members a part of the process, early detection and immediate response leads to better outcomes, and informing the public as sepsis is a very important issue.

Q11 - What do you think would help to increase the efficiency of the sepsis management process?

Question 11 Results on What is Needed to Improve Sepsis Management



It is important to note that a limitation in the survey results includes the fact that, while all 50 participants answered the first four questions, some did not answer the short answer questions. In addition, some short answer questions just had a “yes” or “no” reply and no reasoning associated with it. Furthermore, all qualitative data was analyzed for themes to build the pie and bar charts shown above.

Results of Personal Interviews:

The subjects for the personal interviews included three nurses, one physician, and one patient who had sepsis. Interview questions included the background of each subject and their experiences with sepsis. For the subjects that were healthcare workers, questions that were asked included taking care of septic patients while the

interview with the patient included how he felt when having sepsis and the care he received. While the clinicians felt confident in treating and managing sepsis, the clinicians revealed that they felt that the number of staff and type of facility determined the quality of care given. Additionally, the patient subject felt that the team was unprepared to handle sepsis. Surprisingly, staff shortages hindering septic patient care was a theme among all of the interviews. Each subject had mentioned that low staff numbers led to poor patient care. Furthermore, the resources available also determined the quality of septic patient care. The surgeon that was interviewed had mentioned that a tertiary care facility versus a rural or community-based facility would have better supply, staff, and resources to manage those types of patients more efficiently.

Role	Experience	Method of Interview	Duration of Interview
Nurse, BSN	23+ years	Phone call	30 minutes
Physician, MD	30+ years	Zoom call	25 minutes
Nurse, BSN	20+ years	In-person	25 minutes
Nurse, BSN	5+ years	Phone call	25 minutes
Patient who survived sepsis	Septic - 24 years ago in 1999	Phone call	20 minutes

Another theme observed among the nurses interviewed was how new staff members did not have the real-world skill to take care of a septic patient, including properly identifying signs and symptoms and knowing what orders to carry out. Moreover, all of the nurses mentioned that there needs to be more training among staff. Additionally, it was mentioned that there is sometimes a lack of communication between

staff from different floors when transferring a patient from one unit to another one and that this can affect the timing of blood lactate draw levels, disrupting the sepsis care.

Despite this, all three nurses did mention that they observed better patient outcomes and an increased survival rate from sepsis due to streamlining of patient care to a sepsis management model. Overall, they stated that the sepsis models incorporated into the EHRs had a positive effect. However, two of the three nurses stated that problems with the sepsis models were that the pathway does not take into consideration vital sign changes due to non-sepsis reasons such as alcohol/drug withdrawal and drinking hot/cold substances. Vital sign changes would alert physicians and could automatically trigger an inappropriate order set for treating sepsis into the EHRs. While nurses could inform the physicians to discontinue the order set, new nurses may not be experienced enough to know to do this. Furthermore, there were issues with the retiming of interventions and physicians' orders if a patient was off the floor getting pertinent imaging. This included when lactate levels or pertinent blood work needed to be drawn. Further questioning of the two nurses led to the statement that the sepsis models should incorporate better standards and solutions for timed care, especially in the circumstances described above.

Results of Social Media Posts:

A total of twenty Facebook and Reddit posts from individuals who have had sepsis were analyzed. These individuals initially presented to the hospital with vague symptoms that varied from fatigue and body pains to high fevers and vomiting. Because of how vague their initial presentations were, physicians were not able to diagnose them

with anything specific. Subjects were sent home after having symptoms treated, only to return shortly after when their condition deteriorated further. It is after this that further testing was able to be done and a diagnosis of sepsis was given. At this point these individuals are in septic shock and are critically ill, requiring mechanical ventilation, IV antibiotics and fluids, surgery, and other life sustaining measures. Due to the body's inability to oxygenate while in septic shock, these individuals suffered organ damage and limb loss. During the course of their hospitalization, the persons affected and their caregivers were not given opportunities to be more involved in their care. Clinicians were so focused on stabilization and treatment that very little education was given to the patients and caregivers on what treatments were being given, the patient's condition, and rationales for certain interventions. Following stabilization and recovery, these individuals continue to live with disabilities and psychological issues following an extended hospital stay. These people continue to have poor quality of life following survival from sepsis. Common threads with all posts were frustration that clinicians were not able to provide a specific diagnosis and interventions prior to their condition deteriorating to the point of significant harm. There was also frustration over lack of communication and education given by clinicians during the acute stage of illness. Survivors learned more about sepsis after speaking to other survivors and joining sepsis groups after the fact.

Conclusion of Report

With this data, challenges in sepsis management can be identified as changes and problems with sepsis screening tools, lack of sepsis knowledge by clinicians, and

communication issues between staff whether it be between nurses or physicians. Surprisingly, one major finding from the primary data collection showed that, while clinicians get sepsis training and have the sepsis screening tools to use, clinicians still feel that they need more education, especially with new nurses that still do not have hands-on experience in real world situations. 44.1% of survey responses stated that more education and training is still needed.

Furthermore, while subjects found that the sepsis models and pathways used at work had a positive effect on sepsis patient care, 20.6% of participants felt that there needs to be more improvements made with sepsis screening tools and models used in the EHRs. These improvements include retiming of orders and understanding vital sign changes better in patients that are admitted with different medical conditions.

Lastly, another insight that could be determined from the primary data collection is the importance of engaging the patient and patient's family in early sepsis recognition, especially with high-risk patients. Engaging family members and educating patients on the signs and symptoms of sepsis and when/how to contact physicians for medical treatment was determined to be another area of improvement.

In conclusion, the team intends to use the design thinking process to develop solutions to these challenges and further identify areas of improvement in the sepsis management process. Further information will be given in future milestones.

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Whiteboard Link:

https://www.canva.com/design/DAFnP9Klxy8/c4EUzJhTUzIsQ6dOpgfi4Q/edit?utm_content=DAFnP9Klxy8&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton