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Improving Early Sepsis Identification on Inpatient Units

Corrina Lau

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Abstract

Background: On October 1, 2015, the United States Centers for Medicare and Medicaid Services (CMS) issued a core measure addressing the care of septic patients. Now that care for sepsis patients is a core measure, it is important that all healthcare providers are knowledgeable in how to treat and identify sepsis.

Purpose: The Purpose is to be a “values-driven integrated healthcare delivery system in collaboration with those who share our values.” Patients observed were ages 18-years-old and older from five inpatient units. The professionals in this hospital consisted of a multidisciplinary approach that included, but not limited to, a team of physicians, nurse practitioners, registered nurses, licensed vocational nurses, nursing assistants and respiratory therapists. The inpatient unit processes provide inpatient acute care that include patient stabilization and treatment tailored to each individualized care plan. The patterns on this unit are similar to the processes.

Setting: This large metropolitan hospital is licensed to operate 384 beds and offers many different services ranging from emergency room, intensive care, as well as maternity and pediatric.

Methods: A root cause analysis (RCA) was performed to identify gaps in the hospital’s sepsis protocol. Students worked with the Director of the Sepsis Screening Committee to develop a “Sepsis Screening Observation Checklist.” Next, a chart review audit was conducted by using a “Sepsis Chart Screening Data” form, which allowed students to review EMR charts of 100 patients in five different nursing units. Students also provided nurses with questionnaires to test their baseline theory and operational knowledge of early sepsis identification and hospital protocol specifics.

Results: Using the first method, results showed 42% of patients had sepsis screenings completed in the EMR within the first three hours of their primary nurses coming onto their shift. 93% of the nurses who did complete the sepsis screening within the first three hours of the shift used vital signs that were obtained between 5am - 10am. 32% of the completed sepsis screenings indicated the patient did have a suspected/confirmed infection. 18% of the completed sepsis screenings showed suspected/confirmed infection with two SIRS criteria and only 7% initiated the sepsis protocol. Using the second method, results showed 72% of chart review audits completed the sepsis screening within the first three hours of beginning the shift. 3% of the sepsis screenings indicated the patient was positive for sepsis, while only 1% initiated the sepsis bundle.

Conclusion: It was identified that sepsis adherence is an issue at this large metropolitan hospital. Interventions were unable to be implemented. With the help of interventions, sepsis can be identified early and treatable.

Keywords: sepsis protocol, inpatient unit sepsis, early identification of sepsis, adult patients, sepsis, Clinical nurse leader, SIRS, microsystem

Improving Early Sepsis Identification on Inpatient Units

Introduction/ Statement of Problem

On October 1, 2015, the United States Centers for Medicare and Medicaid Services (CMS) issued a core measure addressing the care of septic patients. Now that care for sepsis patients is a core measure, it is important that all healthcare providers are knowledgeable in how to treat and identify sepsis. While there are different stages of sepsis, beginning with SIRS (systemic inflammatory response syndrome), then progressing to sepsis, severe sepsis, septic shock and ending with MODS (multiple organ dysfunction syndrome) “The CMS definition of severe sepsis is an infection or suspected infection with two or more SIRS criteria plus one sign of organ dysfunction.” (Kalantari, 2017) Unlike many other diseases, sepsis can be caused by a variety of infectious pathogens that enter the body. There is not just one pathophysiological cause of sepsis which brings up the importance of being able to identify and treat sepsis early, ensuring patients do not progress to the later stages that can ultimately lead to death.

According to the Centers for Disease Control and Prevention (CDC), more than 1.5 million people in the United States suffer from sepsis each year, about one in every three patients who die in the hospital setting have sepsis, and at least 250,000 Americans die each year as a result of sepsis ("Data Reports | Sepsis | CDC," 2017). There are a variety of ways sepsis can be improved within the healthcare system. A few ways would be training modules to help nurses gain the tools and knowledge to identify sepsis early, improving management of care, and promoting nurse driven protocols.

This paper will discuss different ways sepsis can be improved upon at a large metropolitan hospital. The framework in which this large metropolitan hospital will be evaluated for sepsis is as follows: shadowing nurses to observe if a sepsis screening is completed within

three hours of starting the shift, performing chart reviews and surveying the nurses to obtain a basic assessment of their knowledge of sepsis. All three of these approaches will help identify any gaps related to reasons as to why sepsis is not identified and treated early. The gathering of data will help improve sepsis identification at this large metropolitan hospital and in the long run will help to improve the status of this hospital.

Methodology

The macro system is a non-profit organization funded from many different sources including charitable donations and grants that provide the majority of its funding which is focused towards upgrading equipment and hospital expansion. This large metropolitan hospital is licensed to operate 384 beds and offers many different services ranging from emergency room, intensive care, as well as maternity and pediatric. It is a Level II trauma center and consist of nine surgical operating rooms, and three cardiac catheterization labs for inpatient and outpatient services. The microsystem observed for this study involved five inpatient units consisting of medical - surgical, telemetry, stroke and skilled nursing.

A root cause analysis (RCA) was performed to identify gaps in the hospital's sepsis protocol. A systematic review was conducted on the process maps formed by the sepsis specialty nurses along with the hospital's protocol regarding sepsis and the Sepsis CMS core measure. This review was performed to evaluate if all the literature was consistent with one another or if any inconsistencies were identified making it harder for the inpatient bedside nurses to understand. Along with evaluating literature, there were a variety of data collecting methods which included one-on-one shadowing, chart reviews, and the use of a survey to observe if compliance was being met per hospital protocol and knowledge assessment on sepsis and current hospital protocol.

During the first portion of gathering data when the CNL students observed the nurses one-on-one. The “Sepsis Screening Observation Checklist” (Appendix A) was formed with the help of the director of the sepsis committee. This was developed to help determine if the nurses were completing the sepsis screening on each patient in the electronic medical record (EMR) within three hours of beginning their shift. A total of 66 patient sepsis screenings were obtained from the one-on-one observation. The second portion of the project was performing chart review audits to further evaluate documentation on the EMR performed by the nurses. A “Sepsis Chart Screening Data” (Appendix B) was formed for the students to use when completing the chart review audits. A total of 100 patients were reviewed from all five inpatient units, looking at both day and night shift making a total of 199 sepsis screenings reviewed. The chart review for each patient must be a patient age 18-years or older and day 2 post-admission.

The assessment tool used to gather information about the hospital and microsystem observed was the 5 P’s assessment tool. Using this tool, the students looked at the Purpose, Patients, Professionals, Processes and Patterns at this large metropolitan hospital. The Purpose is to be a “values-driven integrated healthcare delivery system in collaboration with those who share our values.” Patients observed were ages 18-years-old and older from five inpatient units. The professionals in this hospital consisted of a multidisciplinary approach that included, but not limited to, a team of physicians, nurse practitioners, registered nurses, licensed vocational nurses, nursing assistants and respiratory therapists. The inpatient unit processes provide inpatient acute care that include patient stabilization and treatment tailored to each individualized care plan. The patterns on this unit are similar to the processes where the nurses provide routine care for the patient but take into consideration what needs have to be met in order to provide effective care.

When developing the questionnaire to help assess baseline theory and operational knowledge of early sepsis identification and hospital protocol specifics, the hospital policy regarding sepsis protocol was reviewed and used to help formulate questions to gather data. The students used this questionnaire titled “Sepsis Survey” (Appendix C) and personally delivered them on the units asking the nurses to participate. Of all the questionnaires handed out, a total of 32 questionnaires were completed and used to gather data from. Due to time constraint and low number of participation from nurses, the students would have liked to obtain more completed questionnaires to gain a larger baseline to help determine what nurses are lacking in regards to knowledge about sepsis along with hospital protocol.

Site visits were scheduled with the director of the sepsis committee who was in constant conversation with two students of the group. The site visits were scheduled on a weekly basis by means of email, text message and phone calls. Once given confirmation on dates, the students divided amongst themselves allowing everyone to participate equally. During site visits the students performed all necessary tasks that contributed to project, but also had meetings with the director of the sepsis committee to keep him up to date on the status of the project.

Results

As mentioned there were a variety of different data collection methods. The first method was shadowing the nurses one-on-one to observe if the nurses were completing the Sepsis Screening on each patient in the electronic medical record (EMR) within three hours of beginning their shift. Results showed (Appendix D) out of a total of 66 patients assigned to all nurses shadowed, only 42% of patients had sepsis screenings completed in the EMR within the first three hours of their primary nurses coming onto their shift. 93% of the nurses who did complete the sepsis screening within the first three hours of the shift used vital signs that were

obtained between 5am - 10am. 32% of the completed sepsis screenings indicated the patient did have a suspected/confirmed infection. 18% of the completed sepsis screenings showed suspected/confirmed infection with two SIRS criteria and only 7% initiated the sepsis protocol.

The second method involved the students performing chart review audits to further evaluate documentation on the EMR performed by the nurses. A total of 100 patients were reviewed from all five inpatient units, looking at both day and night shift making a total of 199 sepsis screenings reviewed. Results showed (Appendix E) of the 199 total sepsis screenings reviewed, 72% were completed within the first three hours of beginning the shift. 3% of the sepsis screenings indicated the patient was positive for sepsis, while only 1% initiated the sepsis bundle.

The last and final method of data collection was distributing questionnaires (Appendix C) throughout all five inpatient units to help assess baseline theory and operational knowledge of early sepsis identification and hospital protocol specifics. Questions regarding adequate resources for sepsis treatment and contribution of delays in sepsis treatment were also asked. A total of 32 questionnaires were completed with results showing (Appendix F) 88% correctly answered the definition of positive sepsis screening, 94% correctly answered what is considered SIRS criteria, 97% correctly answered which interventions must be performed within three hours if patient presents as severe sepsis. However, over 50% of nurses were unable to identify what intervention should not be performed during sepsis protocol, and 66% were unable to correctly answer when a “code sepsis” should be called. It was found over 20 nurses think lab delays are the greatest contributor to delays in treatment of sepsis.

Overall, due to the small sample size, the students were only able to obtain a snapshot of what could be a bigger issue as to why early sepsis identification is a problem at this hospital.

However, it is a baseline and shows that there are gaps that need to be filled to help improve sepsis hospital wide.

Implementation

After analyzing all the data that was gathered from different collection methods (one-on-one observation, chart review audits and questionnaires) the students would like to apply a total of four interventions to help the nurses identify and treat sepsis early. The first intervention, is to develop a training session that highlights what the nurses are lacking in regards to baseline knowledge of sepsis and hospital protocol per data collection from questionnaires. This training session will cover the basic pathophysiology of sepsis, the definition of sepsis and what is considered to be a part of SIRS criteria. The training session will also discuss the importance of completing the sepsis screening within the first three hours of beginning the shift and the necessity of using most up to date vitals when completing the sepsis screening. The nurse driven protocol will be reviewed along with how to accurately execute the nurse driven protocol if patient does present positive for sepsis.

The second intervention will be the application of SIRS/Sepsis champion in each unit to monitor patients closely to identify patients with sepsis early. Having a SIRS/Sepsis champion, will help the other nurses how to properly identify a sepsis patient. The SIRS/Sepsis champion will also help execute the nurse driven protocol within a timely manner and assist the primary registered nurse, which will help speed up the process in seeking treatment for the sepsis patient. This will lead to the stabilization of the patient sooner rather than later. Additionally, with SIRS/Sepsis champion, the students developed a sepsis protocol badge card (Appendix G) that will be placed behind every nurse's name badge to use as a quick reference when determining if a patient is positive for sepsis. On the sepsis protocol badge card is the SIRS Criteria, the nurse

driven protocol and the sepsis panel. The final intervention will be an algorithm that will be displayed throughout the entirety of all inpatient units. This will further assist the nurses in determining what tasks should be performed and in what order when a patient is identified as positive for sepsis (Appendix H). None of these interventions have been executed due to time constraint.

Cost Analysis

When initially meeting with the director of the sepsis committee and sepsis specialty nurses it was discussed that a total of four sepsis patients are seen a day in the Emergency Department and three sepsis patients a week are seen in the Intensive Care Unit. It was also mentioned that the hospital does not have an exact number of how many sepsis patients are seen on the inpatient units which could be correlated to the possibility that the nurses may not be able to properly identify sepsis patients. However, the CDC reported that sepsis is the most expensive reason for hospitalization (2015). According to the Sepsis Alliance, the nation's leading sepsis patient advocacy group a study revealed that the mean expense per stay associated with hospitalization was over \$18,000.00 in 2013, making hospitalizations from sepsis 70% more expensive than the average stay (2016)

Taking this information into account along with the numbers given by the director of the sepsis committee the Emergency Department spends about 26 million dollars a year for treatment of sepsis patients only, while the intensive care unit spends 2.8 million dollars a year. Almost 30 million dollars is spent at this particular hospital on medical treatment for sepsis patients alone, not accounting for those who are identified as positive for sepsis on the inpatient units.

By implementing the four interventions discussed earlier will all help identify sepsis earlier. This will ensure not having to use all the resources necessary for sepsis patients and will help decrease the amount of spending for sepsis yearly. Unfortunately, the students were unable to implement the four interventions making the actual cost of the interventions unknown. However, it was discussed which items need to be budgeted for. For instance, a budget needs to be made for every nurse on all the inpatient units to have a sepsis protocol badge card to attach to their name badge. Money also has to be set aside to make enough algorithms to be place around all the inpatient units along with a pay increase to the SIRS/sepsis champion on all units. Lastly, the largest amount of costs will be to train all nurses on inpatient units to attend training session regarding information about sepsis.

Evaluation

The students were unable to evaluate the project however, evaluation would be performed as follows. After implementing all four interventions, each intervention will be analyzed to determine the effectiveness. Immediately after the sepsis training session, the nurses will be re-administered the sepsis questionnaire to compare baseline data with immediate outcome data to evaluate the change in knowledge and opinion. After three months of the training session, along with the distribution of sepsis protocol badge card and the posting of algorithms throughout the unit, the sepsis questionnaire will be re-administered once more to compare against the results from the original time it was administered. A chart review audit will be performed six months following the implementation of all four interventions to evaluate if nurses are completing sepsis screenings within the first three hours of beginning their shift. Also evaluated will be if the nurses are able to identify and treat sepsis early.

Discussion

There were many approaches to compile data and find gaps that could be the reason why nurses are unable to identify sepsis early. One approach was the students shadowed the nurses on the inpatient units to observe if they were completing the sepsis screening for each patient in a certain timeframe. Findings showed that many of the nurses did not complete the sepsis screening when being physically observed, however when analyzing the data during chart review audits through the Electronic Medical Record (EMR) this large metropolitan hospital uses, it was found the sepsis screening was not time stamping the charted information in real time. Due to the functionality of the EMR this hospital uses, the data showed that the nurses did in fact complete the sepsis screening within three hours of beginning their shift, but when physically observed results showed otherwise. With that said, if time permitted the students would have liked to shadow the nurses during a full 12-hour shift to effectively observe when in fact the sepsis screening charts were completed in real time.

Another barrier the students came across, was when forming the sepsis survey to be distributed on the inpatient units. The original format of the sepsis survey had a few select all that apply questions along with some multiple choice. When the original survey was distributed on the inpatient units, it was brought to the student's attention that many of the nurses thought it was hard to understand or thought all the questions were select all that apply. It was collectively decided to edit and change the format of the survey to have all questions be in a multiple choice format. Doing so saved the nurses time when answering as it was less confusing and easier to understand.

The main issue the students ran into, was finding a nurse to help participate in the study to answer the survey. Due to lack of time and resources, the best way to reach the nurses was handing out the survey in person during their shift. Considering the nature of the job, nurses do not have much downtime which led to a smaller sample size than originally hoped for. Perhaps, in the future the surveys could be part of a mandatory module distributed by the hospital to ensure full participation.

Nursing relevance

The role of nurses in this particular project is extremely essential and important. Nurses are constantly at the bedside and should be the first to identify if a patient's condition is improving or declining. When the students were shadowing the nurses one-on-one it was found the sepsis screenings were completed without physically assessing the patient or even being delayed. According to this facility's protocol, it is schedule on their EMR to perform sepsis screenings early in the shift, preferably within the first three hours of beginning the shift. Completing the sepsis screening within the first three hours of the shift is vital as it would be ineffective for the offgoing nurse to complete it at the end of the shift and the oncoming nurse to complete at the beginning of the shift. There needs to be a set protocol in place to effectively determine at what specific time the patient's condition was declining as the nurse driven protocol for sepsis is extremely time sensitive. Nurses are at the forefront when delivering patient care. Thus making the role of nursing in this project significant. Nurses can make a great contribution if able to retain knowledge regarding sepsis and able to properly identify a sepsis patient and know how to treat them. Doing so will help stop the spread of infection throughout the body, but also the ability to save lives.

This large metropolitan hospital is committed to align their work with their core values of respect, caring, integrity, passion, and stewardship. It is the responsibility of the nurse to not only have the knowledge of sepsis but also know how to execute the nurse driven protocol. These nurses must realize that by taking action and educating oneself on sepsis is contributing in caring out all these core values.

CNL Relevance

A Clinical Nurse Leader (CNL) is not only strong in their position as a bedside nurse, but also focuses on ways to improve patient outcomes. After careful observation, there are many ways in which a CNL can help nurses identify and treat sepsis early. Even though, the hospital provided a specific problem they felt needed improvement, a CNL could have easily helped this hospital by initially assessing a microsystem, find gaps and a variety of ways to bridge that gap. A CNL can help carry out this project by taking the lead of all the suggested interventions starting with developing a training session that would be effective for all inpatient nurses to attend. A CNL would also look at all costs analysis and ways to form a budget to cover all costs for the training sessions, sepsis protocol badge card and algorithms to be placed throughout the inpatient units. The role of CNL is not only to implement, but also evaluate for effectiveness and alter if need be. Identify and treating sepsis early is a constant and ongoing project as patients will become septic regardless of interventions. It is just a matter of having a CNL take the lead on the project as they can help reduce the number of sepsis cases seen year round and in turn help save the hospital millions.

As mentioned, the hospital provided the problem to the students and with the help of director of the sepsis committee along with sepsis specialty nurses a plan was made on different strategies to approach this issue. With that said, even though improving early sepsis

identification was a problem at this hospital, does not mean that some of interventions would not work in another hospital. A CNL would have to assess the microsystem elsewhere to identify what gaps are missing pertaining to a baseline knowledge of sepsis if any and tailor the training session to that particular hospital's needs. The sepsis protocol badge card and algorithms would also have to be tailored per those hospitals protocols however the interventions in itself could work in other facilities.

Future directions

The current CNL students were unable to implement the interventions however, the students were able to gather enough data to hand off to the next cohort of students. The next steps would be for the students to design and develop an educational training session or module for all inpatient nurses to attend. From there, all suggested interventions can be implemented with the help of a CNL. With that said, it is imperative to have a CNL take a comprehensive and systematic approach thus ensuring all healthcare providers who work at this hospital have a basic understanding of how to approach the situation if a patient were to be identified as positive for sepsis. The CNL is there to help bridge the gap between all clinicians, nurses and students who are there to implement the project. A CNL can be designated a unit to help execute all interventions as well as help train the nurses who will become the SIRS/Sepsis champion for that unit. The CNL who is designated to each unit will help determine if the interventions are effective and if any changes need to be made.

Conclusion

During observation both physically and virtually through chart review audits it was made apparent that identification and operational baseline knowledge of sepsis is a problem. With the change in CMS identifying sepsis as a core measure it is pivotal for nurses to know how to

identify and treat sepsis early. The CNL students were able to identify gaps and create ways that could improve this issue in this large metropolitan hospital. Unfortunately, due to time constraint, the CNL students were unable to implement any of the interventions, however, the CNL students were able to gather enough data that can be handed back to the facility for a change to be made.

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Appendix A

Sepsis Screening Observation Checklist

1. Was the sepsis screening done?
 - a. No.
 - b. If yes, then answer questions 2-6
2. What time were the vital signs done that were used to complete the screening
 - a. Note: Vital signs from 5am-10am can be used
3. Did the nurse feel that the patient has a suspected or confirmed infection?
 - a. No.
 - b. Yes. If so, why?
4. Do you think the patient has a suspected or confirmed infection?
 - a. No.
 - b. Yes. If so, why?
5. Did the patient have 2 SIRS and a suspected/confirmed source of infection?
 - a. No.
 - b. Yes.
6. Was the sepsis protocol initiated
 - a. No.
 - b. Yes

Appendix B

Sepsis Chart Screening Data

1. Was sepsis screening done?
2. What time?
3. What time were vitals taken which were used for the sepsis screening?
4. What were the lab values related to the SIRS criteria?
 - a. Temperature
 - b. RR rate
 - c. WBC count
 - d. HR
5. Did patient have a suspected or confirmed infection?
6. Was the sepsis bundle initiated?
7. Was the patient transferred to a higher level of care?
8. How long was the patient on the floor before transfer was completed?

Appendix C

Sepsis Survey

1. **True or false.** A positive sepsis screening is defined as 2 SIRS + a suspected or confirmed source of infection.
2. **Which of the following is NOT considered SIRS criteria?**
 - a. Body temperature $>38.3^{\circ}\text{C}/100.9^{\circ}\text{F}$ or body temperature $<36^{\circ}\text{C}/96.8^{\circ}\text{F}$
 - b. Tachycardia
 - c. WBC $>12,000/\text{mm}^3$ or $<4,000$ or 10% bands
 - d. Bradypnea
3. **If patient presents with positive sepsis screening, which of the following is NOT nursing intervention(s) to be implemented?**
 - a. Call RRT
 - b. Draw sepsis panel labs
 - c. Call Code Sepsis
 - d. Obtain urinalysis and culture/sensitivity
4. **True or False (circle one):** only call “code sepsis” if in the ED, ICU or if Severe Sepsis.
5. **Which of the following must be performed within 3 hours of presentation of severe sepsis?**
 - a. Obtain blood cultures prior to administering antibiotics
 - b. Measure lactate level
 - c. Administer broad spectrum antibiotics
 - d. Administer 30mL/kg crystalloid for hypotension or lactate $>2\text{mmol/dL}$
 - e. All of the above
6. **Do you feel that abnormal vital signs are reported to you in a timely fashion?**
 - a. Yes, almost always
 - b. Sometimes
 - c. No, hardly ever
7. **In your experience, what is the greatest contributor to delays in treatment of sepsis in your department? (Select all that apply.)**
 - a. Lack of recognition of potential sepsis in triage
 - b. Delay in diagnosis of sepsis
 - c. Knowledge deficit regarding appropriate management
 - d. Nursing delays (time to completion of orders)
 - e. Lab delays
 - f. Lack of necessary equipment (Please explain.) _____
 - g. Other (Please explain.) _____

8. Do you feel that this facility provides adequate educational resources regarding sepsis for nurses?

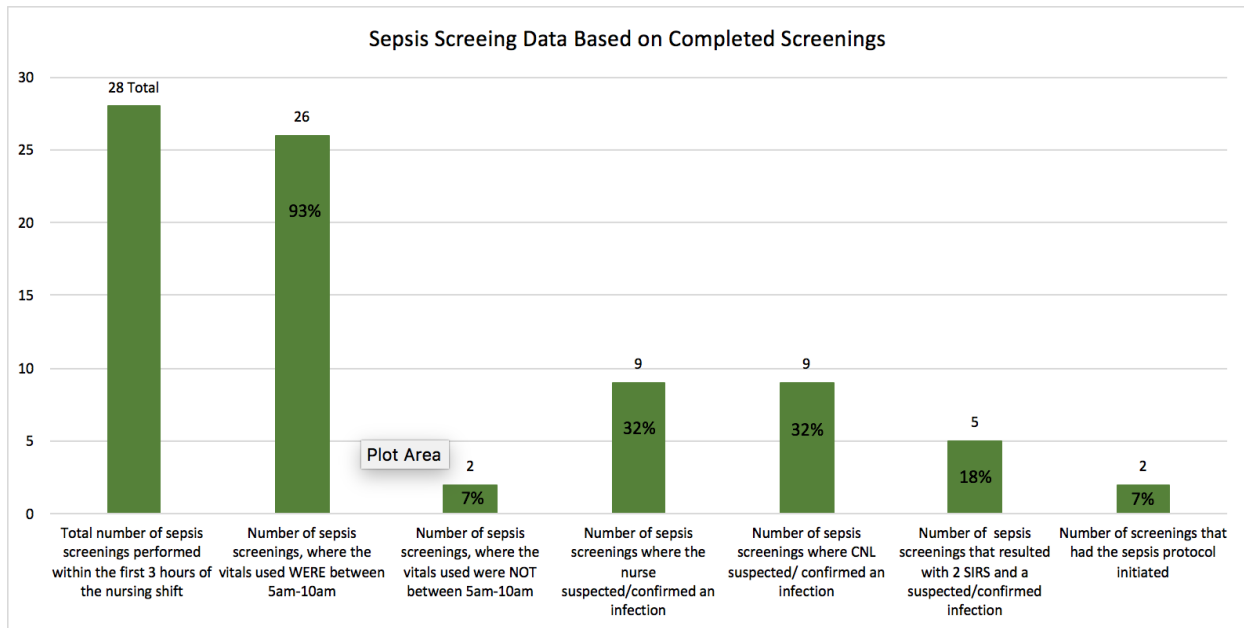
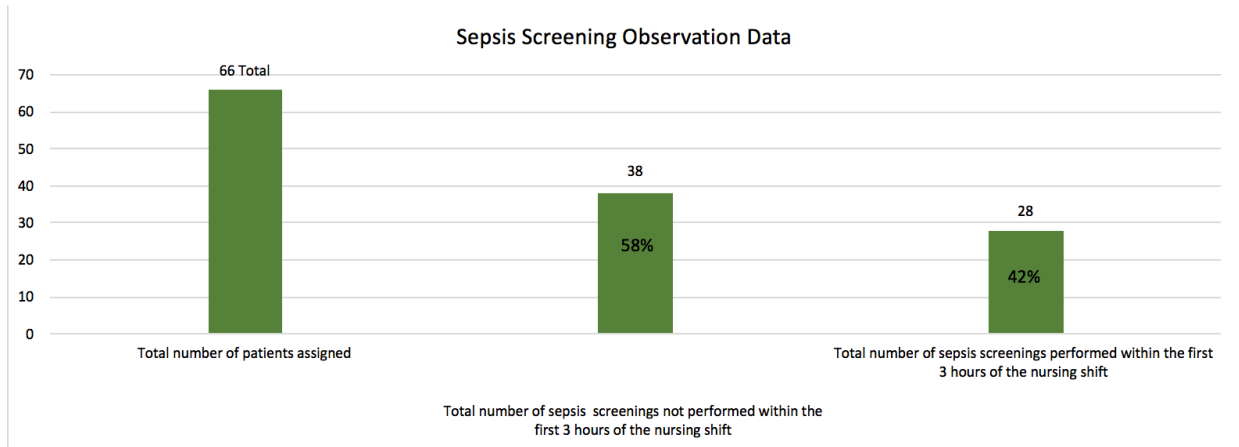
- a. Yes, almost always
- b. Sometimes
- c. No, hardly ever

9. When needed, what resource do you use to reference the Nurse Driven Protocol for sepsis?

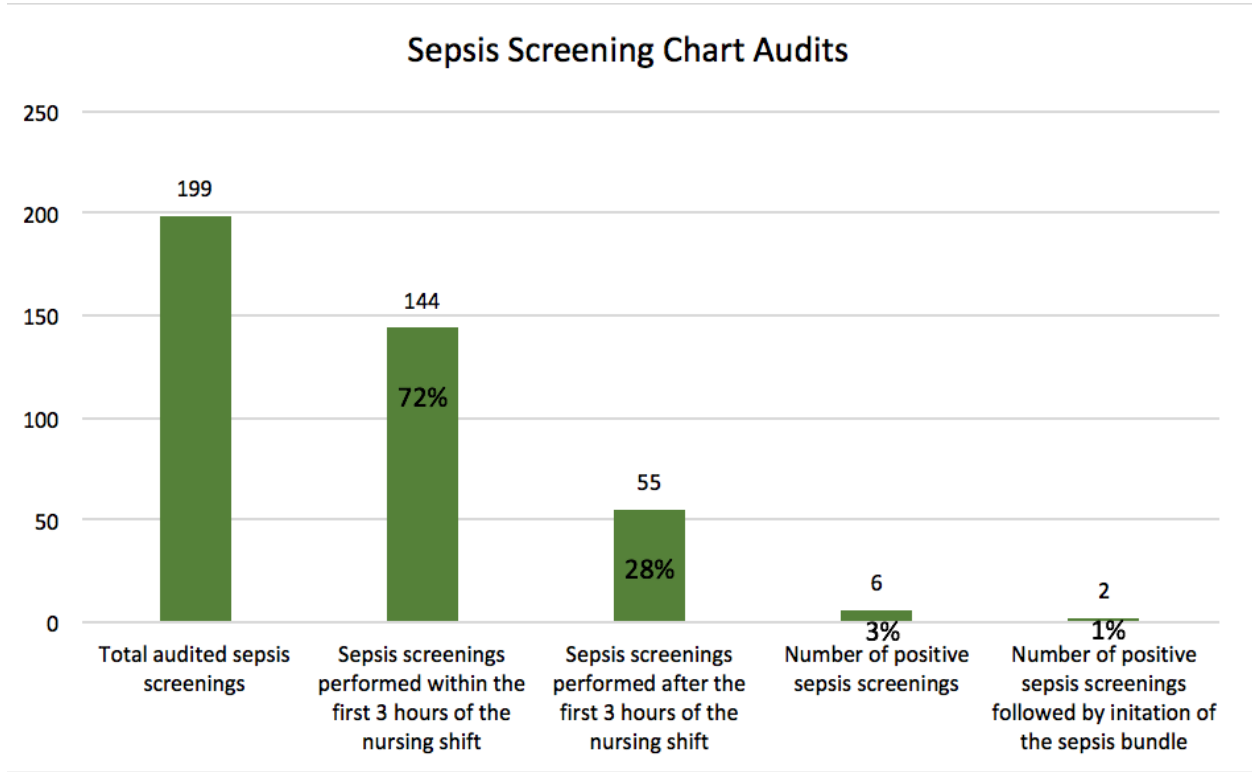
- a. Arcis (electronic medical record)
- b. Policy and Procedure Manual
- c. Google

10. What additional resources/information would you like to have regarding sepsis?

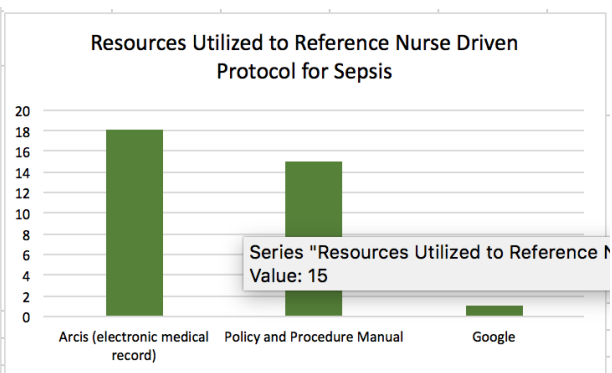
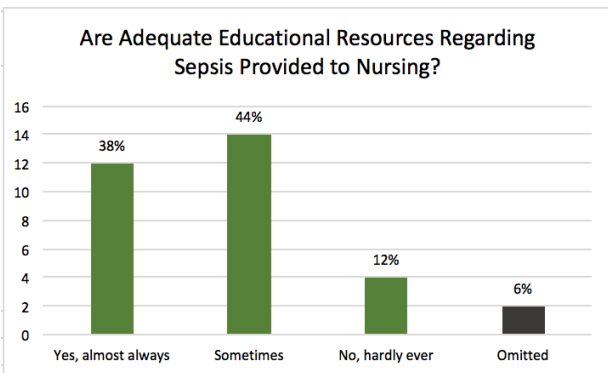
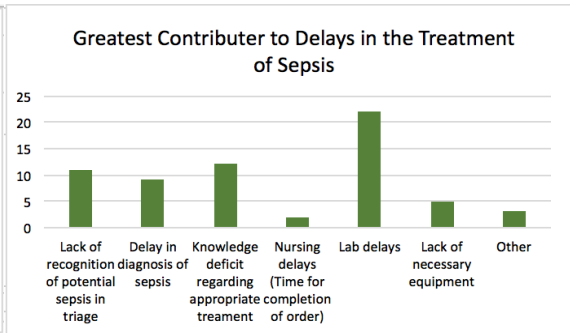
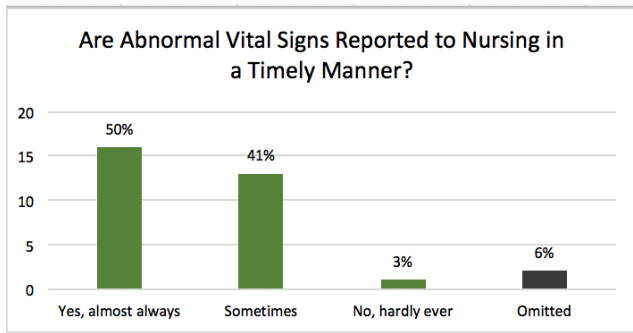
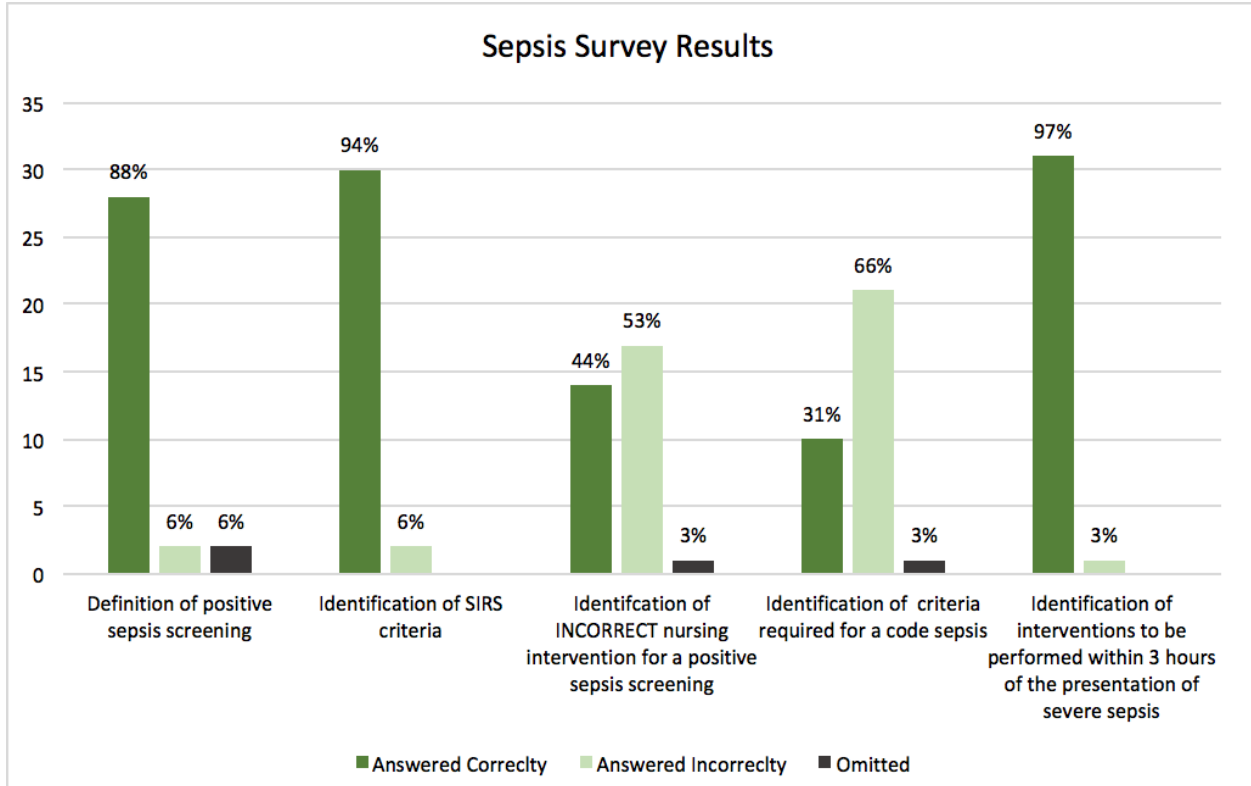
Appendix D




Appendix E



Appendix F



Appendix G




Sepsis Protocol

SIRS Criteria:

- 1. Temperature >38.3°C/100.9°F
or <36°C/96.8°F
- 2. Heart rate > 90
- 3. Respiratory rate > 20
- 4. WBC > 12,000 or < 4,000
- 5. > 10% for differential bands

*If 2 SIRS criteria & suspected/confirmed infection are present, CALL RRT & initiate nurse driven protocol & sepsis panel.

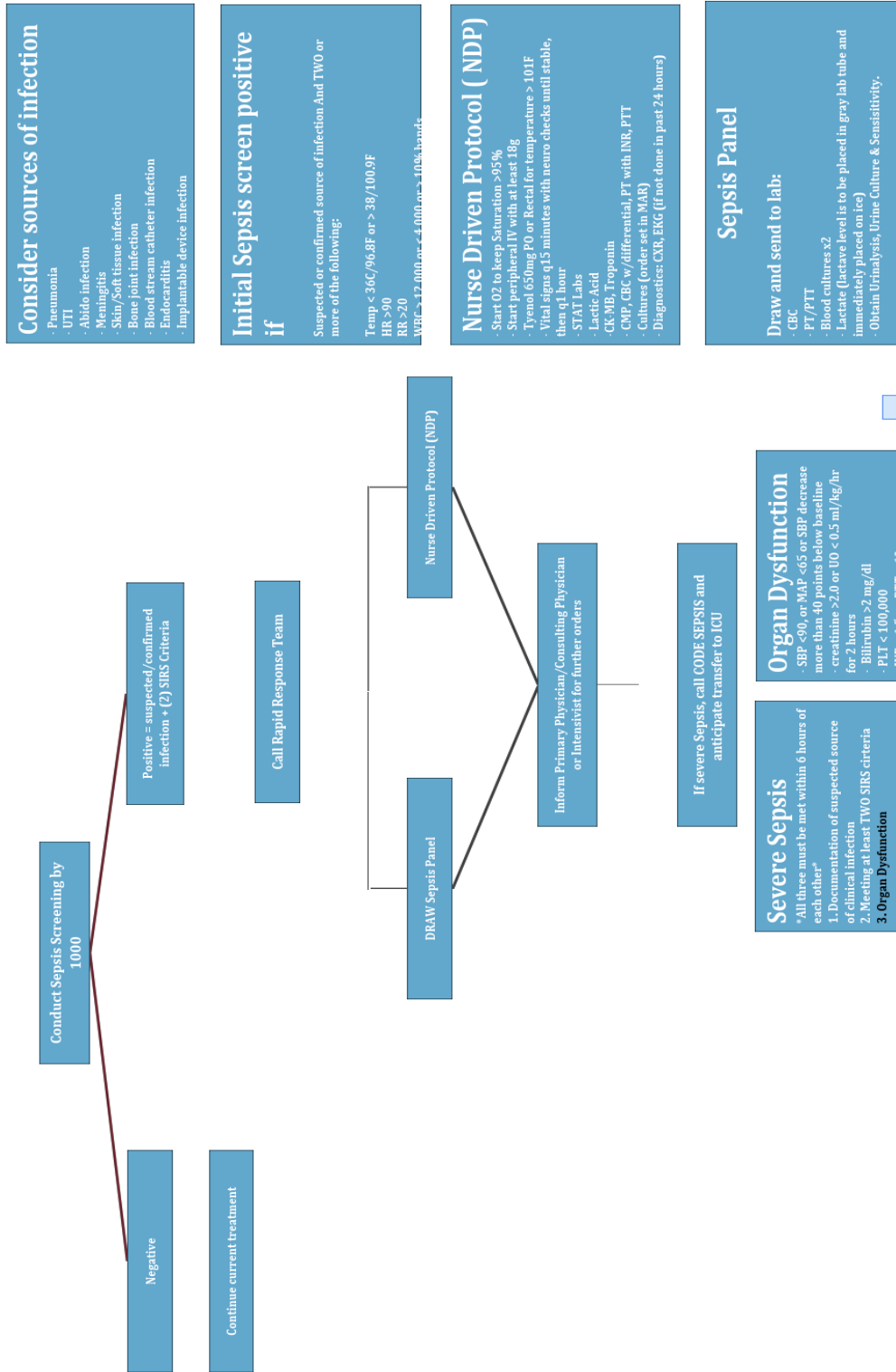


Sepsis Protocol

<p>Nurse Driven Protocol:</p> <ul style="list-style-type: none"> • Start O2, keep saturation >95% • Start peripheral IV w/at least 18g • Tylenol 650mg PO or rectal for temp >101F • Vital signs q15 min w/neuro checks until stable, then q1 hour • STAT labs • Lactic acid • CK-MB, Troponin • CMP, CBC w/ differentials, PT w/INR, PTT • Cultures (order set in MAR) • Diagnostic: CXR, EKG (if not done in past 24 hours) 	<p>Sepsis Panel:</p> <ul style="list-style-type: none"> • Draw and send to lab: • CBC • PT/PTT • Blood cultures x2 • Lactate (lactate level is to be placed in gray tube and immediately placed on ice) • Obtain urinalysis, urine culture & sensitivity
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Sepsis Screening

< BACK NEXT >



Consider sources of infection

- Pneumonia
- UTI
- Abido infection
- Meningitis
- Skin/Soft tissue infection
- Bone/joint infection
- Blood stream catheter infection
- Endocarditis
- Implantable device infection

Initial Sepsis screen positive if

Suspected or confirmed source of infection. And TWO or more of the following:

Temp < 36C/96.8F or > 38/100.9F
 HR >90
 RR >20
 WBC >12,000 or < 4,000 or > 10% bands

Nurse Driven Protocol (NDP)

- Start O2 to keep Saturation >95%
- Start peripheral IV with at least 18g
- Tylenol 650mg PO or Rectal for temperature > 101F
- Vital signs q1.5 minutes with neuro checks until stable, then q1 hour
- STAT Labs
 - Lactic Acid
 - CK MB, Troponin
- CMP, CBC w/differential, PT with INR, PTT
- Cultures (order set in MAR)
- Diagnostic: CXR, EKG (if not done in past 24 hours)

Sepsis Panel

Draw and send to lab:

- CBC
- PT/PTT
- Blood cultures x2
- Lactate (lactate level is to be placed in gray lab tube and immediately placed on ice)
- Obtain Urinalysis, Urine Culture & Sensitivity.

Organ Dysfunction

- SBP <90, or MAP <65 or SBP decrease more than 40 points below baseline
- creatinine >2.0 or UO <0.5 ml/kg/hr for 2 hours
- Bilirubin >2 mg/dl
- PLT <100,000
- INR >1.5 or PTT >60 sec.
- Lactate >2 mmol/L

Severe Sepsis

All three must be met within 6 hours of each other

1. Documentation of suspected source of clinical infection
2. Meeting at least TWO SIRS criteria
3. **Organ Dysfunction**