Summer 8-17-2018

Early Recognition of Severe Sepsis

Robin Haynes
robinm.haynes@gmail.com

Recommended Citation

Early Recognition of Severe Sepsis Presentation

Robin Haynes

University of San Francisco

Early Recognition of Severe Sepsis Presentation: A Quality Improvement Project

Abstract

Sepsis is a medical emergency. If not treated immediately a patient may quickly progress to severe sepsis, septic shock and eventually death. The early recognition of severe sepsis presentation project is an evidence based project for the medical-surgical floor to decrease the amount of time from early signs of sepsis to treatment of sepsis.

In October 2017, the average hospital compliance for the severe sepsis bundle for the fiscal year decreased from 80% down to 55%. Further review showed the decrease in compliance was from the medical-surgical floor nursing staff not notifying physicians when patients showed signs of sepsis. This microsystem needed to have changes developed and implemented to assist the staff with an improved way for recognition of the early signs of sepsis for patients on this unit. Interventions for nursing staff were needed to increase education through repetitive reminders. If the staff had additional sepsis information, with a focus on improving patient care, staff would be more engaged and willing to change current practices. An expectation is that the hospital will have bundle results consistently at a minimum of 80% every month. The conclusion is that by continuing to increase knowledge of sepsis to staff, they will contact the physician immediately when a patient begins showing signs and symptoms.

Section II: Introduction

Problem Description

Death takes on a human form on earth for a few days in the movie "Death Takes a Holiday," and during that time period there are no deaths. Sepsis unlike death in the film never takes a holiday. Every year two hundred fifty-eight thousand people die from sepsis, and greater than one million patients in the United States alone are affected by sepsis. Annually more than eight million people die from sepsis every year in the world (CDC, 2017). In hospitals the number one cause of patient deaths are from sepsis, and are the leading cause of readmissions. This has an annual cost of twenty four billion dollars to hospitals in the United States (Arefian et al., 2017).

The majority of severe sepsis cases are diagnosed while the patient is in the Emergency Department. When a patient with symptoms of sepsis is brought into the Emergency Department, the team knows they have a limited amount of time to identify and begin treatment. There are a few patients who may have some of the signs and symptoms, but they do not meet all of the sepsis criteria at admission. Past studies have shown that patients in the Emergency Department or Intensive Care Unit are diagnosed earlier than the patient who develops severe sepsis while on a medical floor (Schorr et al, 2015).

According to the Centers for Disease Control (CDC), the extreme response sepsis creates causes the body to injure its own tissues and organs. Early detection and treatment saves lives. When sepsis is undetected it may become life threatening. If not treated immediately, tissue

damage may occur, organ failure, and ultimately death. In most cases a patient has an infection

prior to being admitted to the hospital that has progressed into sepsis (CDC, 2017).

Many common infections such as a respiratory, gastrointestinal, urinary tract, and

wounds can cause a clinical deterioration and sepsis. A diagnosis of sepsis is common in

patients with additional comorbidities (Arefian et al., 2016). Diabetics, or those with chronic

diseases such as Congestive Heart Failure (CHF), Chronic Obstructive Pulmonary Disease

(COPD), renal failure, and a compromised immune system are at a higher risk. Young children

and the older population are also at an increased risk (Novosad et al., 2016).

In order to be treated, sepsis must be recognized. Dr. David Carlbom at Harborview

Medical Center in Seattle, Washington, has stated that sepsis can be frustrating to diagnose. The

main reason that sepsis identification is difficult to diagnose is because there is no specific test

that can absolutely identify the patient has sepsis (Bean, 2018).

Sepsis has many impacts on patients, they tend to be sicker which causes a longer

length of stay. It is estimated that one quarter of patients develop sepsis while on a medical-

surgical floor. These patients have an increased chance of progressing to septic shock

and death (O'Shaughnessy, Grzelak, Dontsova, & Braun-Alfano, 2017).

Data has shown that early detection and, blood cultures acquired before a broad

spectrum antibiotic is given increase the chances for sepsis not progressing to severe sepsis and

septic shock. For low blood pressure (MAP < 65) or a lactate greater than 4 mmol/L, IV fluid

resuscitation of 30 ml/kg for normal body weight is recommended. If detected early, within

three hours of signs and symptoms of sepsis the patient has the best chance of recovery, before it

progresses to severe sepsis or septic shock (Liu et al., 2015). Adding a lactate is identified in

assisting with increasing identification of sepsis, which enables earlier interventions. Lactate is

used to identify tissue hypoxia and is one of the markers used for sepsis identification (Kuttab et

al., 2018).

Studies have shown that less than 40% of medical-surgical nurses are able to recognize

sepsis (O'Shaughnessy et al., 2017). A delay in the recognition of signs and symptoms of

sepsis increases the mortality rate for patients on the medical surgical floor. The primary reason

is because the nurses do not communicate with physicians regarding the sepsis signs as quickly

as in the Emergency Department or Intensive Care Unit. One explanation for the delay is that

the patient to nurse ratio is higher on a medical-surgical unit (O'Shaughnessy et al., 2017).

A patient with sepsis is expensive to the hospital system. In a 2017 study, the median cost

for a sepsis patient was $32, 421.00 and the Intensive Care Unit cost was $27,461.00. Length of

stay is 75% longer for patients with a sepsis diagnosis. It is estimated that a patient with sepsis is

the most expensive patient in a hospital (Guirgis et al., 2017).

The state and federal government monitor healthcare cost. Patient length of stay is

reviewed and compared to other hospitals. Readmission rates and healthcare reimbursement rates

are closely scrutinized. Collaboration and effective communication has to be achieved with

educating patients and staff. A reduction in length of stay and attempting to prevent

readmissions is an obtainable goal with efficient and accurate communication between patients

and staff (New, McDougall & Scroggie, 2016).

Sepsis core measurement bundles are electronically tracked every month for the Centers for Medicare and Medicaid Services (CMS). These bundles are for the entire hospital. This is the identification or suspicion of severe sepsis within three hours of the patient meeting the severe sepsis symptoms (Faust and Weingart, 2017). If an element of the bundle is not met a fallout occurs within the timeframe. The patient chart is reexamined to see why this occurred. The hospital was averaging around 80% bundle compliance from January until October 2017. Starting in October sepsis bundle compliance fell to around 55%. This decrease in sepsis bundle compliance resulted with an increased patient length of stay and mortality (Appendix A).

Further review identified that the Emergency Department had decreased the length of time for patients being triaged to admission to the floor. Patients were being transferred to the floor in two hours. The medical-surgical floor nursing staff were not recognizing the signs and symptoms for sepsis. Treatment was delayed, especially if the patient did not originally meet all of the severe sepsis criteria in the emergency department (Appendix B). In the medical-surgical floor sepsis organ failure is contributed to identification not being completed timely (Alberto, Marshall, Walker, & Aitken, 2017).

Recently the CDC reported in 2016 sepsis mortality was between 28% to 50% of all cases (Davoren, Suvacarov, & Herrmann, 2017). Early recognition and treatment improves patient outcomes. A study was completed looking for ways to predict patient mortality within 24 hours of being seen in the Emergency Department (Javed, et al., 2017).

Available Knowledge

The search strategy was started with working on a PICO question for a certain patient population, intervention, standard treatment for this patient population, and the outcome of early recognition of severe sepsis on a medical surgical floor. Patients with sepsis or severe sepsis on a medical surgical floor (P), the early recognition of sepsis (I), early treatment for a patient with sepsis or severe sepsis (C), will meet the sepsis bundle outcomes for CMS and decrease length of stay for these patients when it is recognized early (O). From this PICO question, a search was completed using the electronic data bases in CINAHL, DynaMed, and Fusion from the library at USF. The following criteria was used on CINAHL and DynaMed: severe sepsis, early recognition, and acute care. The search resulted with seven articles on CINAHL and nothing applicable from DynaMed. A search was then completed on Fusion with the following criteria English, with publication dates from 2016 to 2018: severe sepsis, early recognition of sepsis, and sepsis bundle outcomes. This resulted in an extremely large amount of publications, with two of the articles that had also come up on CINAHL and four other articles that are used in the literature review (Appendix C). The John Hopkins Evidence-Based Appraisal Tool (JHEBP) was used to evaluate the articles (Appendix D).

O'Shaughnessy, Grzelak, Dontsova, & Braun-Alfano, (2017) conducted a retrospective review of the implementation of a sepsis screening tool on a medical-surgical floor to assist with early sepsis recognition. The screening tool used was an electronic medical record sepsis based monitoring system. The goal being of early recognition, early treatment, and a decrease in patient

mortality from sepsis. The majority of the study was placed on nurses understanding that sepsis

is an emergency that should be treated as expediently as a stroke or heart attack patient. Staff was

surveyed to identify gaps in their knowledge of sepsis. The average of correct answers was 53%.

The patients were screened through two hospitals. Staff were retested after education with an

increase in sepsis knowledge to around 80%.

   Levy, Evans, & Rhodes, (2018) is an editorial regarding the Surviving Sepsis Bundle:

2018 update. The editorial states the Surviving Sepsis Campaign (SSC) in 2004 is an evidence

based bundle that has seen sepsis quality improvement since it was started in 2005. In 2016

 guidelines were changed from a 3 hour bundle to a recommended 1 hour bundle. The 3 hour

bundle consists of a lactate measurement, blood cultures before administration of a broad

spectrum antibiotic. Crystalloid fluid administration is given for a MAP < 65 and/or a lactate > 4

mmol/L. Administration of vasopressors when crystalloid fluids do not increase the MAP or

decrease the lactate. This new literature for patients with sepsis and septic shock supports that

the new 1 hour bundle will improve the outcome for these patients.   The Centers for Medicare

and Medicaid Services (CMS) has mandated public reporting for the sepsis bundle. The SSC

campaign provided evidence that supported following the sepsis bundle and the realization that

sepsis is a medical emergency and needs to be treated as soon as it is suspected.

   Alberto, Marshall, Walker, & Aitken (2017) conducted a systematic review method

through six electronic databases to review sepsis screening tools for early recognition of sepsis.

The review consisted of more than 8000 citations. The study was looking for recommendations

to assist with early identification. They found that many of the electronic programs for sepsis

identification that facilities used were inconsistent. These systems recognize when the vital signs

are outside of the norm, notifying physicians and nursing by an electronic alert. The sepsis

patient being cared for on a medical-surgical floor, showed that delayed recognition increased

mortality. Nurses were the responders to alerts. Emphasizing the importance of nurses knowing

the early recognition signs. The article concluded the nurse using their own paper screening

method was more consistent. The electronic notification systems assisted, however the nurse

recognizing the sepsis symptoms and alerting the physicians for protocol to escalate care is

where patient outcomes were improved.

Javed et al. (2017) conducted a secondary analysis of two prospective studies from

emergency department patients with severe sepsis. This study examined factors on predicting

death for patients within 24 hours of being seen in the Emergency Department. The research

indicated early recognition and treatment improves patient outcomes. The researchers

examined the different factors for presentation for sepsis and the clinical deterioration if not

treated rapidly. Researchers observed the different comorbidities from these patients, such as

diabetes, cancer, and COPD to see if this was a variable. The most common infections were

pulmonary, urinary tract and intra-abdominal in this study. The study showed the initial serum

lactate and mSOFA score were better indicators of patient death within the first 24 hours of

Emergency Department identification.

Kuttab et al. (2018) conducted a retrospective cohort study that compared the lactate

greater than 4 mmol/L in two groups. Many of Group 2 were given hydrocortisone (1.9% vs

22.4%). The study concluded that elevated lactate is a good indicator of tissue hypoperfusion

from anaerobic metabolism that occurs when oxygen demand exceeds oxygen delivery. Lactate

does occur without tissue hypoperfusion. The study concluded that lactate did not increase the

time for the patient to receive antibiotics or IV fluids. Group 2 patients did have a lower hospital

mortality, 30 day, and 90 day mortality number. The conclusion was that Group 2 had an earlier

recognition of severe sepsis and earlier interventions.

Guirgis et al. (2017) conducted a retrospective review of patients treated for sepsis that

were 18 years of age and older. There were a total of 3917 sepsis admissions in the study. The

hospital in Jacksonville, Florida completed a hospital wide educational effort where patients

were screened in the Emergency Department triage, the ICU, and the general floors of the

hospital for sepsis. The electronic health record had a sepsis alert program, and staff were

provided with sepsis alert pocket cards for reference. The study was conducted in two phases, the

first was before the screening was implemented and the second was after implementation. The

results were a reduction in patient mortality, decreased length of stay in ICU, decreased length of

hospital stay, and had an average savings of $7100.00 per patient to the hospital.

<div align="center">Rationale</div>

The mission statement for the hospital is commitment to furthering the healing ministry

of Jesus. Resources are dedicated to providing excellent, affordable health care, and compassion.

This includes advocating for the poor and disenfranchised, and working with the community to

improve the quality of life. The hospital attempts to create environments that meet the physical,

mental, and spiritual needs for patients. The hospital is licensed for 370 beds. There is an

average of 200 patients diagnosed with sepsis in the hospital every month.

This project is on a 30 bed medical surgical unit. The majority of the patients have a

diagnosis of CHF, COPD, GI bleed, pneumonia, cellulitis, UTI, and/or renal complications.

Many of the patients have a psych diagnosis and substance abuse issues. The average age is 66

years old. The majority of the patients who are admitted have Medi-Cal, which has a lower rate

of reimbursement to the hospital. The daily patient census is around 24 and the average length of

stay is between four to five days.

The national hospital performance measures for severe sepsis and septic shock were

enacted by the Centers for Medicare and Medicaid Services and The Joint Commission on

October 1, 2015. The goal for these core measures as they are commonly known as, was an

alignment for national hospitals. This would be accomplished by early treatment for sepsis

patients. Mortality from severe sepsis and septic shock would also be decreased (The Joint

Commission, 2016).

Difficulty in identification of sepsis and a lack of education (knowledge gaps) in staff are

the reasons why severe sepsis implementation may be delayed for patients who present with

symptoms (Holder et al, 2016). In 2015, the hospital was experiencing a delay in sepsis

recognition in the Emergency Department. The Emergency Department started sepsis

education for all staff, if one particular staff member was having difficulty with recognition, one

on one remediation was implemented. The Emergency Department continues with education and

 updates to remind staff to observe for sepsis presentation when examining patients.

In 2017, the hospital had several months where the sepsis bundle was at 100%. Starting

 In October 2017, the sepsis bundle dropped to an average of 55%. The evidence-based practice

model by Rosswurm and Larrabee (1999) assists healthcare providers through the process to

assist change to evidence based practice (Appendix E). This model was used in collaboration

with the medical-surgical floor staff to assist with the needed changes. The process has six steps

that starts with assessing the need for change and ends with integrate and maintain changes in

practice (Appendix F). This project is expected to work because the changes added are to

remind staff to think about sepsis while they are doing patient care. Every desk surface will have

a sepsis reference card posted, sepsis worksheets will be available to help with questions,

education will be presented in huddles, and then posted in breakrooms.

The estimated cost for this project is $1,250.00. The pre/post survey is on the electronic

survey system, and the medical-surgical unit is paying for the survey cost. The manager is

extremely supportive of her staff getting additional education for sepsis. The majority of the cost

for this project was from labor costs, time for posters to be placed on the unit, preparation of the

survey, uploading the survey, and designing the sepsis reference cards to be placed on the desk

portion of the computer stations. There was a cost saving to the project because the unit

volunteers laminated the sepsis reference cards that are going to be placed under the desktop.

The staff will have a sepsis worksheet to assist them if they think their patient may have sepsis.

The research time was for approval of the survey, posters, information for healthcare

professionals from CDC, the unit educator approval, and time coordinating everything.

Preliminary findings were needed to increase bundle compliance, barriers between nurses

and physicians were identified, the core measure bundle guidelines not consistently being used,

and the number one issue identified was early recognition and the need to start treatment.   In

reviewing literature about change, the processes implemented in an Illinois hospital raised

sepsis awareness and decreased sepsis mortality by 13%. The study used daily tracking tools to

assist in sepsis recognition (Davoren et al., 2017).

This project is expected to be successful for several reasons. The first being upper

management is extremely supportive about the needed education and monitoring. The core

bundle severe sepsis data from the Quality Department showed where the delay in early

treatment was occurring. There is support from several nurses on the medical-surgical floor who

are engaged in the care of sepsis patients and want to increase knowledge to the other staff.

These nurses have volunteered to be sepsis champions for staff on the floor. A driver diagram

assisted with planning the project (Appendix G).

Hospital administration is reviewing the increased length of stay and mortality from

patients that have a sepsis diagnosis associated with their hospitalization. Administration is

also reviewing the increased financial cost the hospital faces with a sepsis patient, especially the

financial cost of delay if sepsis is not recognized early and treatment started quickly.

<div align="center">Specific Project Aim</div>

This evidence based improvement project is to improve early recognition of severe sepsis

on the medical surgical floor. The purpose of this project is to obtain 80% or greater monthly

compliance with early sepsis detection on the medical surgical floor. This includes blood

cultures, treatment with a broad spectrum antibiotic, and fluids if needed. Within three hours of

signs and symptoms of severe sepsis to increase a patient's chance of recovery (Appendix H).

To obtain the previous 80% monthly facility percent compliance, an additional two

patients per month that are diagnosed with sepsis on the medical surgical floor need to meet

CMS bundle compliance. Patient length of stay is expected to decrease with earlier sepsis

recognition. Patient mortality rates are also expected to decrease with earlier diagnosis and

treatment. This will be accomplished by increasing nursing engagement, provide nursing

education to increase critical thinking in regards to sepsis, and to raise staff awareness of the

high mortality rate that occurs with sepsis. Ultimately this should promote an effective change to

the medical-surgical floor in regards to sepsis patients (Appendix I).

Section III: Methods

<div align="center">Context</div>

The medical-surgical nursing staff consists of Registered Nurses, Nursing Assistants,

and Unit Assistants. The nurse to patient ratio is 1-5. The level of education is varied on the

floor from Associate degrees to PhD's. The nursing staff experience also varies from new

graduates to experienced nurses. The floor has a very cultural diverse staff.   The cultural mix is

 brought up because in some cultures it is extremely difficult for some of the nurses to approach

the physicians. This complicates communication. Especially if the nurse is suspecting sepsis

and the physician disagrees. The resources in the project are to assist staff, especially for staff

that may be reluctant to speak up.

Many evidence based research articles demonstrate the methods other facilities

use to meet the sepsis guidelines, reduce patient length of stay, and decrease mortality. A

strengths, weakness, opportunities and threats (SWOT) analysis was completed. This was

completed to assess how successful the process would be for the medical-surgical staff to

improve sepsis recognition (Appendix J).

The Institute of Health Improvements Plan-Do-Study-Act (PDSA) was the model

implemented in sixty hospitals in four United States regions for an early sepsis detection

program (Schorr et al., 2016). Implementing the model from this study for the medical surgical

floor is recommended (Appendix K).

The estimated cost for this project is $1250.00. The main objective of this project is

early recognition of severe sepsis that will decrease patient length of stay and a reduction in

mortality from sepsis. The estimated cost savings of early recognition is around $4,500.00 a day

per patient. Annually this could be over $50,000.00 savings for the hospital from 12 patients

(Appendix, L).

Intervention

The medical surgical floor staff were given the information sheet for healthcare

providers from the CDC at a daily huddle for review (Appendix M). The information sheet

was disseminated around the floor, the information board in the breakroom and at the nurses

station where staff use computers. The Sepsis sheet from CDC was also posted in the staff

breakroom and at the nurses station.

The pre/post sepsis survey was prepared. (Appendix N). The manager of the unit

reviewed the survey, it was posted on an electronic website for staff to complete. Paper copies

were given to staff if they did not want to do the electronic survey. Completed paper copies

were manually uploaded into the electronic website. Sepsis identification cards were prepared,

approved by the manager of the unit, copied on bright neon pink paper, laminated, and placed

under plastic on the computer workstations on wheels (Appendix O).

Staff may use a sepsis worksheet when receiving report from the Emergency Department

that was designed for the project (Appendix P). Staff input was used in the design of the

worksheet. It is to assist staff and is not part of the permanent medical record.

A journal post was given to staff at huddles encouraging them to take the survey.

(Appendix Q). Small two inch square "Think Sepsis" signs were printed on the same bright

neon pink paper, laminated, and placed on the upper right hand computer workstations as a

reminder to staff. Sepsis education is given to staff on an ongoing basis in huddles, and one on

one if needed. The results from the survey have been discussed during the daily huddles.

Nursing floor staff suggested the most effective way to educate without a formal class was to

have journal posts available in the staff breakroom. Explanations have been given to staff on why

certain signs and symptoms are also indicators for staff to understand all of the elements they

need to watch for in their patients.

<center>Measures</center>

The early severe sepsis recognition will be measured using the Institute for Healthcare

Improvement (IHI) measurement for learning for the nursing staff and process improvement for

the patients with early signs and symptoms of sepsis (Appendix R). The project goal is to

educate the staff to use it for their daily workload (IHI, 2018).

The outcome measures will be for early sepsis recognition in patients by the nursing

staff with treatment. The treatment will be blood cultures, antibiotics, and fluids under three

hours of the patient showing signs of sepsis. The goal is a decreased length of stay for the

patient (IHI, 2018).

The process measurement to see if the changes have improved the measurement will be

80% or greater early recognition and treatment within 3 hours of presentation. The balancing

measure has the potential with a decreased length of stay for patients, of increasing readmission

rates (IHI, 2018). This will be monitored.

The CMS severe sepsis core bundles data is how compliance will be measured for the

80% compliance. This is a reasonable goal at this time. It gives the hospital time to achieve the

80% minimum goal, continuing to work on increasing the percentage to 90%, especially since

the Surviving Sepsis Campaign (SSC) has reset a new goal of 100% compliance for sepsis

patients (Levy, Evans, & Rhodes, 2018).

The data will be concurrent with the monthly sepsis cases that are monitored for CMS

through chart review. The hospital also has additional sepsis cases reviewed concurrently to

review if a trend starts occurring, then it will be reviewed and fixed in a current timeframe.

Ethical Considerations

The ethical aspects for the study were looked at using the 10-step bioethical decision

model from Thompson and Thompson (Appendix S). Delays in early identification of

severe sepsis on medical surgical patients. The key individuals in this project are the nursing

staff. Through CMS chart audits identification of delayed care may have increased patient

length of stay and chances of mortality. Patient privacy is protected, the data reviewed is on a

need to know only. The data that is released has no patient identification, it is numerical data

only.

Beneficence and nonmaleficence are the issues in this situation. A major goal of the

project is to educate staff to be more efficient in sepsis recognition. The thought being that the

patient will have a speedier recovery. Professional moral positions are from the CNL

competencies to use technology to improve health outcomes of the patient. The moral position is

to improve the health outcomes of the patient. No value conflicts identified. No formal ethic

review was needed, the hospital sepsis committee approved the project to be completed.

Range of actions could have a decreased length of stay for patients and decrease in patient

mortality. The course of action is to improve patient outcomes through beneficience. Review of

results are expected to have a positive outcome.

Section IV: Results

The early recognition of severe sepsis project started with an information sheet from the

CDC for healthcare providers (Appendix M). The information sheet was given to staff during a

daily huddle and put on the education board in the staff breakroom. An electronic survey was

provided to staff. The paper copies of sepsis recognition cards were made, laminated, and placed

under the plastic top of the computer work area.

The results from the sepsis survey that staff completed showed that there is a need for

more education (Appendix T). The timeline had a delay because the plastic for the computers

on wheels had to be ordered from the IT department and then they needed to be put on by the IT

department. This process to get completed was longer than originally planned for the reference

cards to be placed. Processing of reinforcement tools was the biggest barrier for the project. This

delayed the start by three weeks. The cards are a small part of the project, but by having them in

place for the staff, it is a continual reminder to think of the possibility of sepsis. The manager

absorbed the plastic cost into the operating budget for the medical-surgical floor.

The patient census at the hospital decreased after the reference cards were placed on the

computer workstations. This is normal during summer, to have a decrease in sepsis patients.

This resulted in fewer charts to be audited for the project.

The staff are provided education through daily huddles and journals for staff. I have been

asked to attend monthly staff meetings and present material regarding sepsis to staff. Feedback

from staff for consistent education to be provided for physicans and new nurses when they are

oriented at the hospital. The night shift physicians do not place orders when the nurses call them

when patients present with sepsis symptoms. This information has shown that there is a wide

variation in care on the floors and that the physicians may not be using a sepsis bundle that was

provided to them.

The major piece of information that the medical/surgical staff was concerned about

was the Emergency Department will call to give the nurse a report on the patient that is being

transferred to the floor. Right before the patient is transferred up to the floor the Emergency

Department will take a final set of vital signs. Patients may not meet sepsis criteria in the

Emergency Department, but the last set of vital signs right before transportation, the patient may

meet criteria. There is a potential impact of transferring a critically ill patient to the floor who

may have to be immediately admitted to ICU.   It makes it difficult for the nurse admitting the

patient, having to contact the physician for new orders and treatment. This information was

brought up in the sepsis meeting and I was tasked setting up a meeting to find a solution to

rectify this issue.

The manager decided to have a large whiteboard placed in the staff breakroom that will

be divided into four sections. The sections will be on sepsis, hospital acquired pressure ulcers,

falls, and diabetes. This will assist staff with education, graphs on how the unit is doing, and

general information to show the floors progress in keeping sepsis recognition a priority.

The audit results from the sepsis survey were shared with management and it has been

requested that the survey be used on other floors and adapted for physicians. The major goal

being early severe sepsis recognition, impact on length of stay and mortality.

Section V: Discussion

Summary

The project will not be completed until the end of November 2018. The data collected has

been useful by providing data that showed the need for education and repetitive reminders. The

success will be to keep the momentum moving forward, reminding staff to continually be

watching for signs and symptoms of sepsis in patients.

Conclusions

      Early identification and treatment of sepsis patients has provided the

hospital with the opportunity to decrease length of stay and mortality rates (Appendix U). This

 is expected to reduce costs for the hospital. A majority of the patients are uninsured, or

homeless. It is imperative for staff to have the knowledge, strategy, and understanding that is

needed to identify early sepsis in their patients. This project can easily be implemented in other

floors. Reinforcing sepsis through huddles, staff meetings, and annual training, should be able to

sustain the project. There has been talk about increasing the project from the microsystem into

the macrosystem.

      This project encompassed many of the roles for a CNL. The clinician with an emphasis

on risk reduction for the patient. The outcomes manager to assist with early patient identification

for treatment. Advocate for the patient and nursing staff. An educator to assist staff with

educational materials needed for reference. The information manager encouraging the use of the

electronic system for early recognition. As a risk manager to find ways to improve patient care.

References:

Alberto, L., Marshall, A., Walker, R., & Aitken, L. (2017). Review: Screening for sepsis in

general hospitalized patients: a systematic review. *Journal Of Hospital Infection*, *96*305-

315. doi:10.1016/j.jhin.2017.05.005

American Association of Colleges of Nursing (AACN). (2013). *Competencies and curricular*

expectations for clinical nurse leader education and practice. Retrieved from

http://www.aacnnche.edu/publicationswhite-papers/cnl

Arefian, H., Heublein, S., Scherag, A., Brunkhorst, F. M., Younis, M. Z., Moerer, O.,

…Hartmann, M. (2017). Hospital-related cost of sepsis: A systematic review. *Journal of*

Infection, 74(2), 107-117.

Bean, M. (2018). This seattle hospital aims to get sepsis patients on antibiotics within 3 hours

– here's how. *Becker's Clinical Leadership & Infection Control, 2018* (2)*,* 30.

Centers for Disease Control and Prevention. (2017). *It's time to talk about sepsis*. Retrieved from

https://www.cdc.gov/sepsis/pdfs/consumer_brochure_its_time_to_ talk_about _sepsis,

508.pdf

Davoren, M. L., Suvacarov, M., & Herrmann, S. (2017). The SEPSIS challenge: Developing

processes and educating staff lead to reduced mortality. *American Nurse Today*, *12*(12),

12-14.

DeBacker, D., & Dorman,T. (2017). Surviving sepsis guidelines: A continuous move toward

better care of patients with sepsis. *Journal of the American Medical Association*, *317*(8),

807-808.

Faust, J., & Weingart, S. (2017). The past, present, and future of the centers for medicare and

medicaid services quality measure SEP-1: The early management bundle for severe

sepsis/septic shock. *Emergency Medicine Clinics Of North America*, (1), 219.

doi:10.1016/j.emc.2016.09.006

Guirgis, F. W., Jones, L., Esma, R., Weiss, A., McCurdy, K., Ferreira, J., & ... Gray-Eurom, K.

(2017). Managing sepsis: Electronic recognition, rapid response teams, and standardized

care save lives. *Journal Of Critical Care*, doi:10.1016/j.jcrc.2017.04.005

Holder, A. L., Gupta, N., Lulaj, E., Furgiuele, M., Hidalgo, I., Jones, M., …Birnbaum, A.

(2016). Predictors of early progression to severe sepsis or shock among emergency

department patients with nonsevere sepsis. *International Journal of Emergency Services,*

9, 1-11.

Institute for Healthcare Improvement: (2018). Retrieved from: http://www.ihi.org

Javed, A., Guirgis, F. W., Sterling, S. A., Puskarich, M. A., Bowman, J., Robinson, T., & Jones,

A. E. (2017). Sepsis/Infection: Clinical predictors of early death from sepsis. *Journal Of*

Critical Care, *42*30-34. doi:10.1016/j.jcrc.2017.06.024

Kuttab, H. I., Sterk, E., Rech, M. A., Nghiem, T., Bahar, B., & Kahn, S. (2018). Early

recognition and treatment of sepsis after the addition of lactate to the laboratory's

critical result call list. *Journal Of Intensive Care Medicine (Sage Publications Inc.)*,

33(2), 111-115. doi:10.1177/0885066616668148

Levy, M. M., Evans, L.E., & Rhodes, A. (2018). The surviving sepsis campaign bundle: 2018

update. *Intensive Care Medicine*, *44*(6), 925-928. doi:10.1007/s00134-018-5085-0

Liu, V. X., Morehouse, J. W., Marelich, G. P., Soule, J., Russell, T., Skeath, M., …Whippy, A.

(2016). Multicenter implementation of a treatment bundle for patients with sepsis and

intermediate lactate values. *American Journal of Respiratory and Critical Care Medicine,*

193(11), 1264 – 1270.

New, P., Mcdougall, K., & Scroggie, C. (2016). Improving discharge planning communication

between hospitals and patients. *Internal Medicine Journal*, *46*(1), 57-62.

doi:10.1111/imj.12919

Novosad, S. A., Sapiano, M. P., Grigg, C., Lake, J., Robyn, M., Dumyati, G., & ... Epstein, L.

(2016). Vital signs: Epidemiology of sepsis: Prevalence of health care factors and

opportunities for prevention. *Morbidity & Mortality Weekly Report*, *65*(33), 864-869.

O'Toole Gerard, S. (2016). Ethical considerations for clinical nurse leaders. In King, C. R.

Editor & O'Toole Gerard, S. Editor (Eds.), Clinical nurse leader certification review (pp.

246). New York, NY: Springer.

O'Shaughnessy, J., Grzelak, M., Dontsova, A., & Braun-Alfano, I. (2017). Early sepsis

identification. *MEDSURG Nursing, 26*(4), 248-252.

Rosswurm, M. A., & Larrabee, J. H. (1999). A model for change to evidence-based practice.

Image: Journal of Nursing Scholarship. 31(4), 317-322.

Schorr, C., Odden, A., Evans, L., Escobar, G.J., Gandhi, S., Townsend, S., & Levy, M. (2016).

Implementation of a multicenter performance improvement program for early detection

and treatment of severe sepsis in general medical-surgical wards. *Journal of Hospital*
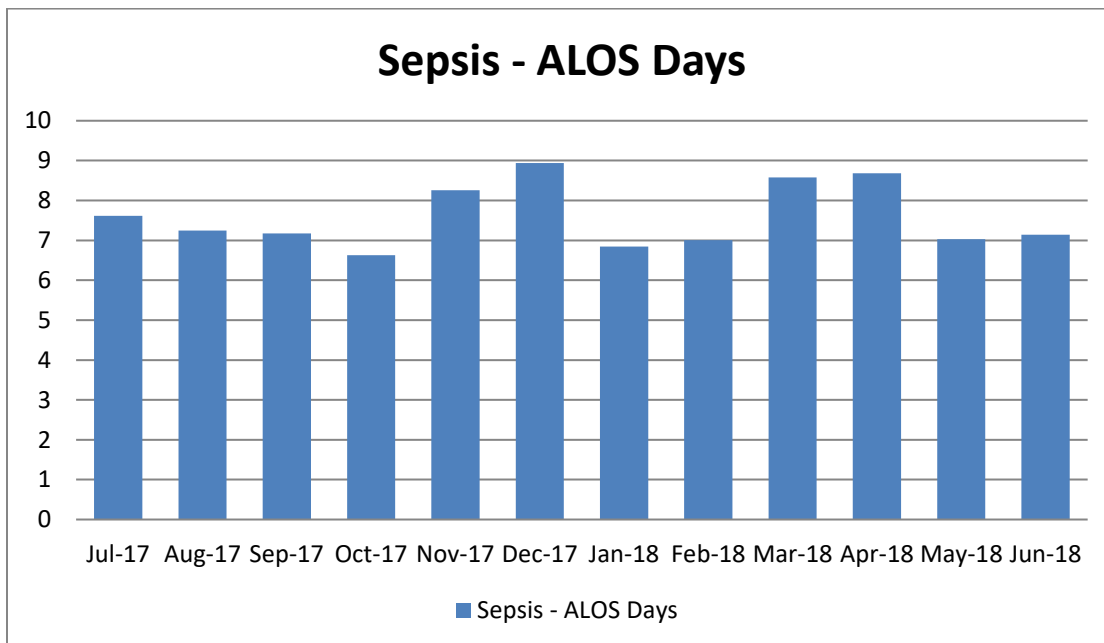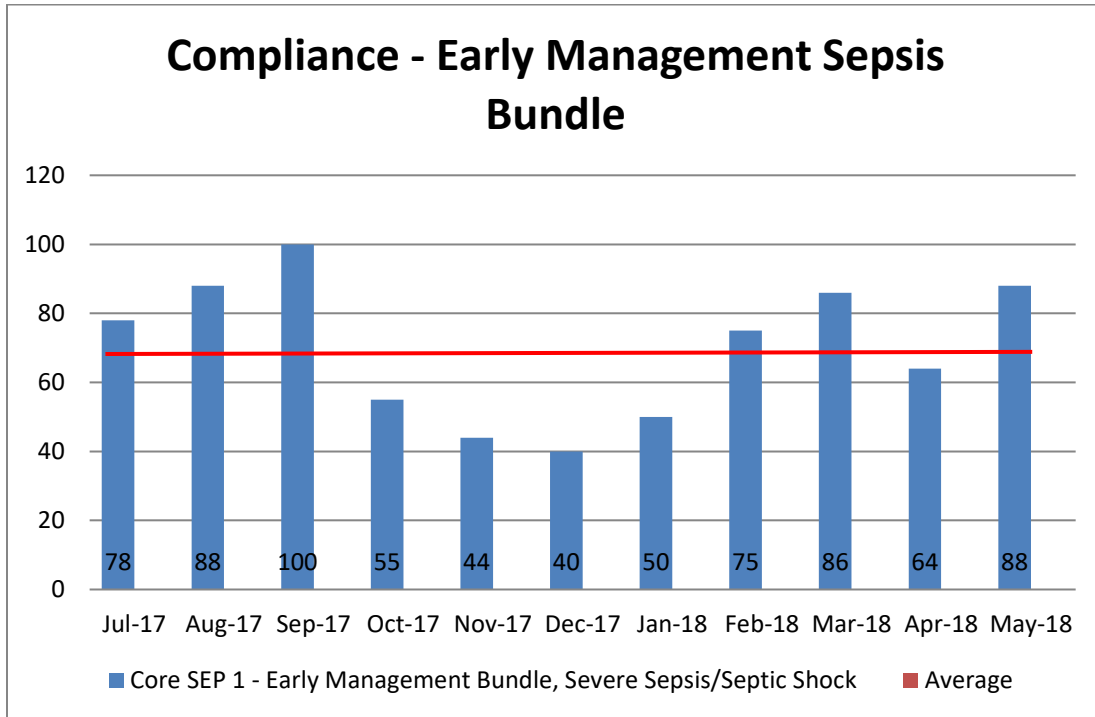
Medicine, 11(S1), S32-S39.

The Joint Commission (2016). Specifications manual for national hospital inpatient quality

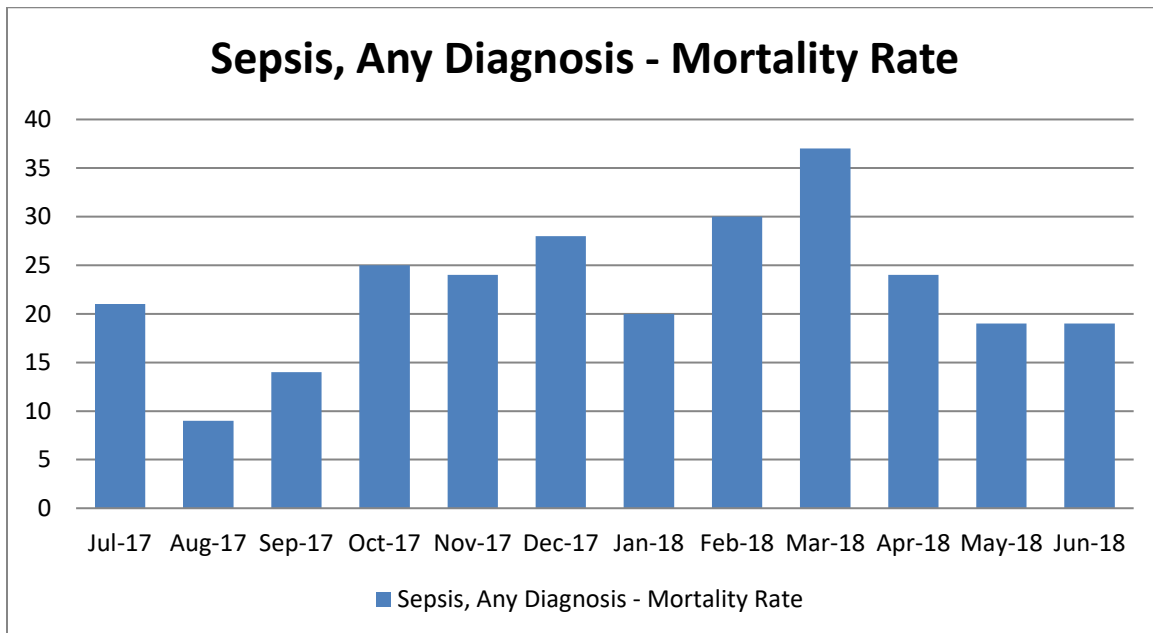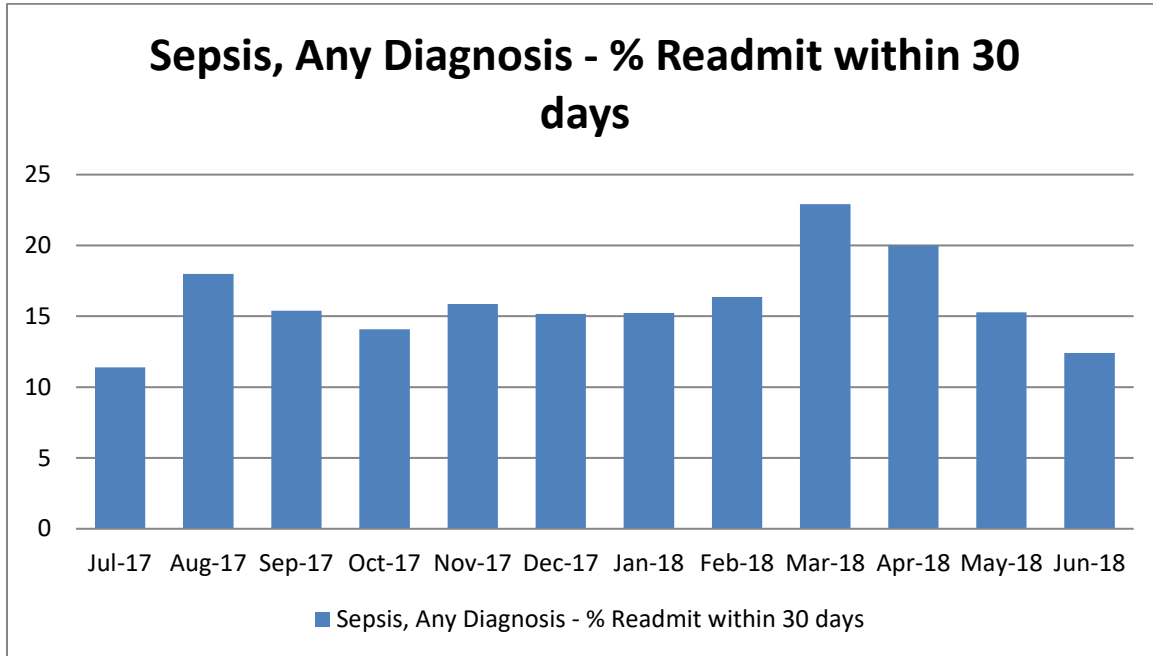measures. Retrieved from https://www.jointcommission.org

Thompson, J., & Thompson, H. (1981). *Ethics in Nursing.* New York, NY: Macmillan.

Section VII: Appendices

Appendix A

Run Charts Fiscal Year 2018

Compliance - Early Management Sepsis Bundle

Month	Value
Jul-17	78
Aug-17	88
Sep-17	100
Oct-17	55
Nov-17	44
Dec-17	40
Jan-18	50
Feb-18	75
Mar-18	86
Apr-18	64
May-18	88

■ Core SEP 1 - Early Management Bundle, Severe Sepsis/Septic Shock   ■ Average

Sepsis - ALOS Days

■ Sepsis - ALOS Days

Jul-17 Aug-17 Sep-17 Oct-17 Nov-17 Dec-17 Jan-18 Feb-18 Mar-18 Apr-18 May-18 Jun-18

Sepsis, Any Diagnosis - % Readmit within 30 days

Legend: Sepsis, Any Diagnosis - % Readmit within 30 days

Month	Value
Jul-17	11.5
Aug-17	18
Sep-17	15.5
Oct-17	14
Nov-17	16
Dec-17	15.2
Jan-18	15.3
Feb-18	16.5
Mar-18	23
Apr-18	20
May-18	15.3
Jun-18	12.5

Sepsis, Any Diagnosis - Mortality Rate

Legend: Sepsis, Any Diagnosis - Mortality Rate

Month	Value
Jul-17	21
Aug-17	9
Sep-17	14
Oct-17	25
Nov-17	24
Dec-17	28
Jan-18	20
Feb-18	30
Mar-18	37
Apr-18	24
May-18	19
Jun-18	19

Appendix B

Fishbone Diagram: Cause and Effect

STAFF

Too busy to recognize patient with sepsis

Patient load

CAUSE

Staff not aware of all the signs and symptoms of sepsis

Staff education

Delay in blood draw from lab

No accountability or feedback

Annual sepsis education presentation

Delay in lab results

Delay in recognizing signs and symptoms of sepsis

Patient may not meet criteria in Emergency Department

Sepsis symptoms may be subtle

Electronic trigger system not utilized

Time from sepsis presentation not being tracked to keep under 3 hours

Nurse waiting to talk with physician

No easy way to reference sepsis at bedside

Poor communication between nurse and physician

Appropriate antibiotic not always stocked on floor

Patient admitted with another diagnosis, not suspecting sepsis

EQUIPMENT

METHODS

Appendix C

Evaluation Table

PICO question: For patients with sepsis or severe sepsis (P), acute care recognition of sepsis (I), sepsis bundle (C), will increase early recognition of sepsis (O)

Citation	Conceptual Framework	Design/ Method	Setting/ Sample	Variable studied and their definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to practice
O'Shaughnessy, J. et al. (2017)	None	Qualitative study (secondary analysis of data)	Two hospitals: 1 52 bed medical-surgical unit at a 687 bed nonprofit Level II trauma center; teaching hospital. 2 38 bed medical-surgical unit at a 554 bed nonprofit Catholic teaching hospital	Independent variable: Length of time to identify sepsis. SIRS criteria, sepsis, severe sepsis	Divided into 6 phases	CQI Model seven-phase action cycle of the Knowledge to Action framework	Room to improve provider notification and for nurses to identify sepsis. Nurses seem to like a case study better for projects to improve	This study can be rated as a Level V B using the John Hopkins Evidence Based (JHEBP) appraisal tool
Levy, M. M., Evans, L. E., & Rhodes, A. (2018)	None	Editorial Review	None	Surviving Sepsis Campaign's evidence based guidelines to current	The new 1 hour bundle to improve care of patients with sepsis		The need to impress that sepsis is a medical emergency that needs to be identified early for a better survival rate	This study can be rated as a Level IV A using the John Hopkins Evidence Based (JHEBP) appraisal tool.

Alberto, L., Marshall, A. P., Walker, R., & Aitken, L. M. (2017)	None	Systemic Review	Six databases over 8000 citations screened to review screening tools for early recognition of severe sepsis in the hospital wards	Independent variable: Sepsis Dependent variables: Hospital wards, generalized hospitalized patients	Screening tools for early identification of sepsis were analyzed	BMJ Diagnostic test studies and critical appraisal, Critical Appraisal Skills program Diagnostic Test Study Checklist, STARD checklist	Electronic tools work in real time, but are not always accurate. Accuracy was inconsistent in the study. Paper and nurse identification worked better.	This study can be rated as a Level 1 B using the John Hopkins Evidence Based (JHEBP) appraisal tool.
Javed, A., et al. (2017)	None	A qualitative study (secondary analysis of data from two studies) 410 patients in study	The first study was a single center study which was a prospective, observational cohort study from 2012 to 2014 in the adult ED.	The second study was in a multi-center randomized clinical trial from January 2007 to January 2009 in 3 large urban tiertiary centers.	Primary outcome was death within 24 hours of the patient being triaged.	Student;s t-test, Wilcoxon rank-sum test, chi-square, Fisher's exact test. Differences in demographics, infection source, treatment, comorbidity between mortality and survival	Initial lactate and mSOFA score were the best indicators for severe sepsis patients in predicting mortality within 24 hours of ED admission	This study can be rated as a Level III B using the John Hopkins Evidence Based (JHEBP) appraisal tool.
Kuttab, H. I., et al. (2018)	None	Retrospective cohort study	One hundred twenty one patients at an academic medical center Two groups	The addition of lactate as a standard practice to critical result laboratory call list for sepsis.	Group 1 had a higher lactate than Group 2.	Microsoft excel and SPSS version 21 Continuous variables used a t test. Categorical variables used the X^2 or Fisher exact test	Adding the lactate did not alter results too much. Increased early recognition of severe sepsis with intervention thought to be reason why Group 2 had a lower mortality than Group 1.	This study can be rated as a Level 1 A using the John Hopkins Evidence Based (JHEBP) appraisal tool.

Guirgis, F., et al. (2017)	None	Retrospective review of patients 18 years and older	3917 total admissions. 1929 in the before phase and 1988 in the after phase. One facility from October 1, 2013 to November 10, 2015	Patients with a discharge ICD-9 code for sepsis, severe sepsis, or septic shock from the EHR system. Patients had to meet severe sepsis criteria.	Patients were from the first phase and the second phase was after the sepsis alert program was initiated. The before phase was 13 months and after phase was 12 months	Categorical variables summarized with counts and percentage by Chi-square, Fisher's tests. The Wilcoxon rank sum test was used for continuous data	Electronic recognition and rapid response team had better outcomes for patients with sepsis	This study can be rated as a Level 1 A using the John Hopkins Evidence Based (JHEBP) appraisal tool.

Appendix D

John Hopkins Research Evidence Appraisal Tool

238   Johns Hopkins Nursing Evidence-Based Practice: Model and Guidelines, Second Edition

Appendix E: Research Evidence Appraisal Tool

Evidence Level and Quality:_____

Article Title:		Number:
Author(s):		Publication Date:
Journal:		
Setting:	Sample (Composition & size):	
Does this evidence address my EBP question?	☐Yes	☐No Do not proceed with appraisal of this evidence

Level of Evidence (Study Design)

A. Is this a report of a single research study? *If No, go to B.*		☐Yes	☐No
1. Was there an intervention?		☐Yes	☐No
2. Was there a control group?		☐Yes	☐No
3. Were study participants randomly assigned to the intervention and control groups?		☐Yes	☐No
If Yes to all three, this is a Randomized Controlled Trial (RCT) or Experimental Study	→ ☐ LEVEL I		
If Yes to #1 and #2 and No to #3, OR Yes to #1 and No to #2 and #3, this is Quasi Experimental (some degree of investigator control, some manipulation of an independent variable, lacks random assignment to groups, may have a control group)	→ ☐ LEVEL II		
If Yes to #1 only, OR No to #1, #2, and #3, this is Non-Experimental (no manipulation of independent variable, can be descriptive, comparative, or correlational, often uses secondary data) or **Qualitative** (exploratory in nature such as interviews or focus groups, a starting point for studies for which little research currently exists, has small sample sizes, may use results to design empirical studies)	→ ☐ LEVEL III		
NEXT, COMPLETE THE BOTTOM SECTION ON THE FOLLOWING PAGE, "STUDY FINDINGS THAT HELP YOU ANSWER THE EBP QUESTION"			

© The Johns Hopkins Hospital/The Johns Hopkins University

John Hopkins Research Evidence Appraisal Tool

Research Evidence Appraisal Tool   239

Appendix E: Research Evidence Appraisal Tool

B. Is this a summary of multiple research studies? *If No, go to Non-Research Evidence Appraisal Form.*	☐Yes	☐No
1. Does it employ a comprehensive search strategy and rigorous appraisal method (Systematic Review)? *If No, use Non-Research Evidence Appraisal Tool; if Yes:*	☐Yes	☐No
a. Does it combine and analyze results from the studies to generate a new statistic (effect size)? **(Systematic review with meta-analysis)**	☐Yes	☐No
b. Does it analyze and synthesize concepts from qualitative studies? **(Systematic review with meta-synthesis)**	☐Yes	☐No

If Yes to either a or b, go to #2B below.

2. For Systematic Reviews and Systematic Reviews with meta-analysis or meta-synthesis:
   a. Are all studies included RCTs? → ☐ LEVEL I
   b. Are the studies a combination of RCTs and quasi-experimental or quasi-experimental only? → ☐ LEVEL II
   c. Are the studies a combination of RCTs, quasi-experimental and non-experimental or non-experimental only? → ☐ LEVEL III
   d. Are any or all of the included studies qualitative? → ☐ LEVEL III

COMPLETE THE NEXT SECTION, "STUDY FINDINGS THAT HELP YOU ANSWER THE EBP QUESTION"

STUDY FINDINGS THAT HELP YOU ANSWER THE EBP QUESTION:

NOW COMPLETE THE FOLLOWING PAGE, "QUALITY APPRAISAL OF RESEARCH STUDIES", AND ASSIGN A QUALITY SCORE TO YOUR ARTICLE

© The Johns Hopkins Hospital/The Johns Hopkins University

John Hopkins Research Evidence Appraisal Tool

240   Johns Hopkins Nursing Evidence-Based Practice: Model and Guidelines, Second Edition
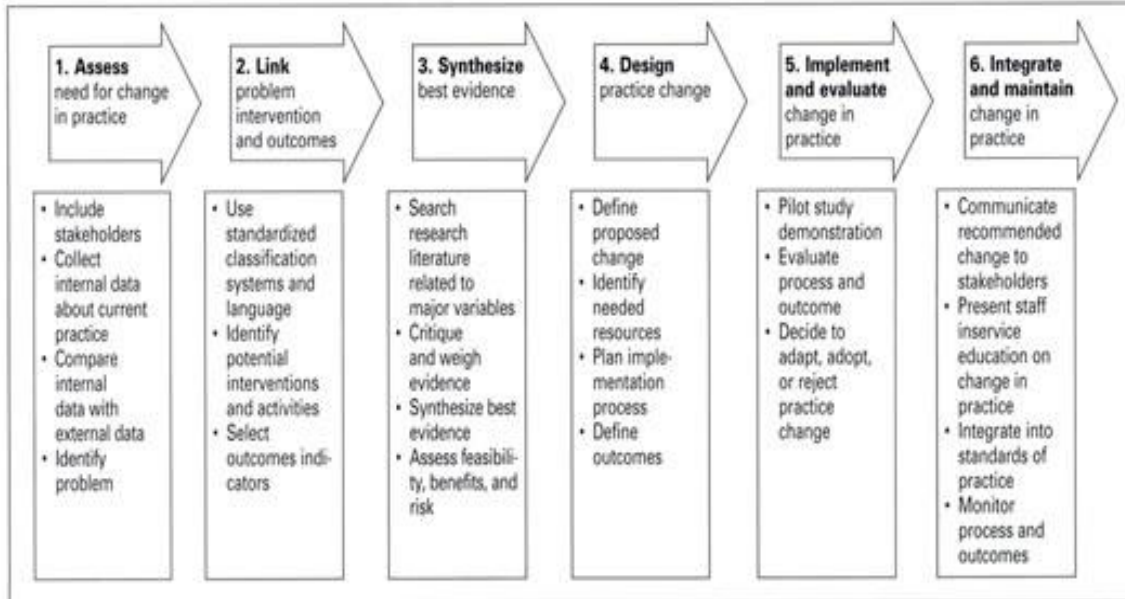
Appendix E: Research Evidence Appraisal Tool

Quality Appraisal of Research Studies

• Does the researcher identify what is known and not known about the problem and how the study will address any gaps in knowledge?	☐Yes	☐No	
• Was the purpose of the study clearly presented?	☐Yes	☐No	
• Was the literature review current (most sources within last 5 years or classic)?	☐Yes	☐No	
• Was sample size sufficient based on study design and rationale?	☐Yes	☐No	
• If there is a control group:			
o Were the characteristics and/or demographics similar in both the control and intervention groups?	☐Yes	☐No	☐NA
o If multiple settings were used, were the settings similar?	☐Yes	☐No	☐NA
o Were all groups equally treated except for the intervention group(s)?	☐Yes	☐No	☐NA
• Are data collection methods described clearly?	☐Yes	☐No	
• Were the instruments reliable (Cronbach's α [alpha] ≥ 0.70)?	☐Yes	☐No	☐NA
• Was instrument validity discussed?	☐Yes	☐No	☐NA
• If surveys/questionnaires were used, was the response rate $\geq 25\%$?	☐Yes	☐No	☐NA
• Were the results presented clearly?	☐Yes	☐No	
• If tables were presented, was the narrative consistent with the table content?	☐Yes	☐No	☐NA
• Were study limitations identified and addressed?	☐Yes	☐No	
• Were conclusions based on results?	☐Yes	☐No	

Quality Appraisal of Systematic Review with or without Meta-Analysis or Meta-Synthesis

• Was the purpose of the systematic review clearly stated?	☐Yes	☐No
• Were reports comprehensive, with reproducible search strategy?	☐Yes	☐No
o Key search terms stated	☐Yes	☐No
o Multiple databases searched and identified	☐Yes	☐No
o Inclusion and exclusion criteria stated	☐Yes	☐No
• Was there a flow diagram showing the number of studies eliminated at each level of review?	☐Yes	☐No
• Were details of included studies presented (design, sample, methods, results, outcomes, strengths and limitations)?	☐Yes	☐No
• Were methods for appraising the strength of evidence (level and quality) described?	☐Yes	☐No
• Were conclusions based on results?	☐Yes	☐No
o Results were interpreted	☐Yes	☐No
o Conclusions flowed logically from the interpretation and systematic review question	☐Yes	☐No
• Did the systematic review include both a section addressing limitations and how they were addressed?	☐Yes	☐No

QUALITY RATING BASED ON QUALITY APPRAISAL

A High quality: consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence

B Good quality: reasonably consistent results; sufficient sample size for the study design; some control, and fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence

C Low quality or major flaws: little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn

© The Johns Hopkins Hospital/The Johns Hopkins University

Appendix E

Figure 1.
A Model for Evidence-Based Practice

1. Assess need for change in practice	2. Link problem intervention and outcomes	3. Synthesize best evidence	4. Design practice change	5. Implement and evaluate change in practice	6. Integrate and maintain change in practice
• Include stakeholders • Collect internal data about current practice • Compare internal data with external data • Identify problem	• Use standardized classification systems and language • Identify potential interventions and activities • Select outcomes indicators	• Search research literature related to major variables • Critique and weigh evidence • Synthesize best evidence • Assess feasibility, benefits, and risk	• Define proposed change • Identify needed resources • Plan implementation process • Define outcomes	• Pilot study demonstration • Evaluate process and outcome • Decide to adapt, adopt, or reject practice change	• Communicate recommended change to stakeholders • Present staff inservice education on change in practice • Integrate into standards of practice • Monitor process and outcomes

From Rosswurm & Larrabee (1999). By permission of Sigma Theta Tau International Honor Society of Nursing.

Appendix F

Early Sepsis Recognition on Medical-Surgical Floor– EBP Change

	Change Step Actions	Step Timeline
Step 1. Assess need for a change	- Discuss delay in recognition of severe sepsis symptoms on medical floors with the severe sepsis team - Quality Improvement data review - Benchmark by review of other hospitals data - Identify the reasons why staff are not responding when severe sepsis flags occur in the electronic charts - Assess severe sepsis knowledge of staff	April 2018
Step 2. Link problem with interventions and outcomes	- Identify the need for education of staff on medical floors to initiate severe sepsis protocol when electronic flags are triggered - Monitor several charts to see the frequency of electronic flags that occur - Identify need for the nurse to contact the physician if patient has changes that appear suspicious of an infection	May 2018
Step 3. Synthesize the best evidence	- Review literature on early recognition of severe sepsis - Emphasize the importance of early recognition and why it needs to be a priority to medical floor managers - Assess the benefit to the patient of early treatment - Review data from deaths with severe sepsis	May and June 2018
Step 4. Design a change in practice	- Implement a pilot study on medical-surgical unit - Prepare pre-survey form for nurses on the pilot study unit for feedback - Educate nurses on pilot study units on evidence-based practice - Place early sepsis recognition cards on WOW work area - Staff notify attending physician for orders - Discussion during daily floor huddles	June and July 2018

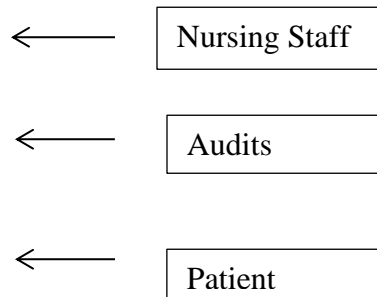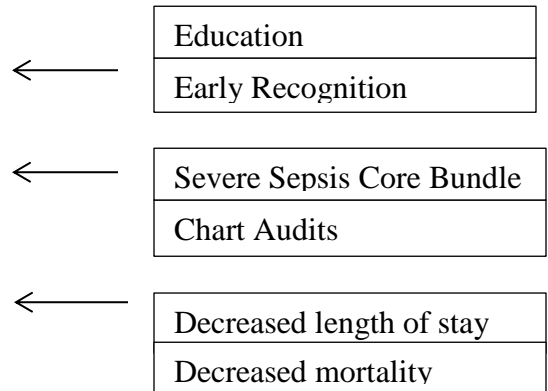| Step 5. Implement and evaluate the practice change	- Implement pilot study on medical-surgical unit - Continue reinforcement of education in daily huddles - Review data from survey form - Monitor charts for improvement on severe sepsis early recognition - Communicate results to severe sepsis team - Post results for staff on units to review - Use staff on units to audit each other to help increase knowledge base	Aug to Oct 2018
Step 6. Integrate and maintain the practice change	- Meet with nurses on unit to review results - Feedback from nurses on what is working and what needs to be improved - Ongoing monitoring - Continue to communicate results to severe sepsis team - Prompt inservice education to staff with any changes - Look to creative ideas to keep the momentum going - Encourage staff engagement	Nov 2018 to Jan 2019

Appendix G

Driver Diagram

Aim	**Primary Drivers**	**Secondary Drivers**

We aim to increase nursing staff early recognition of severe sepsis on the medical-surgical floor up to 80% by November 2018
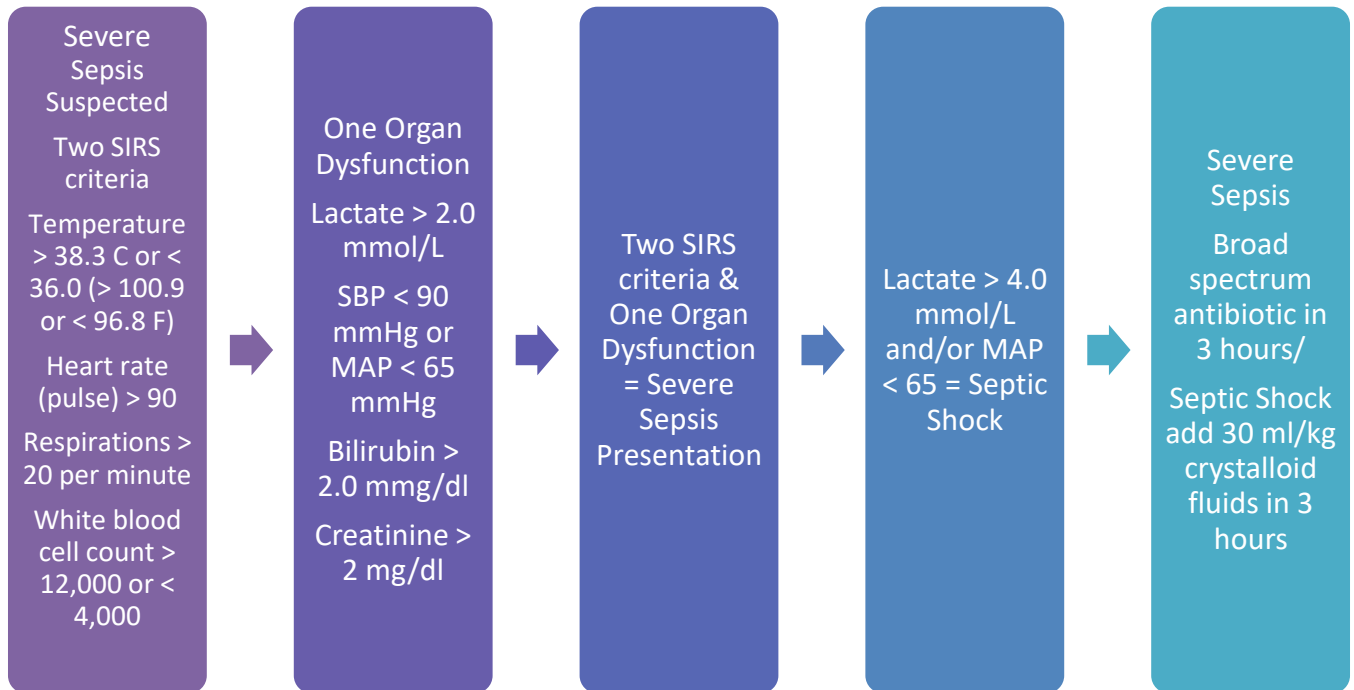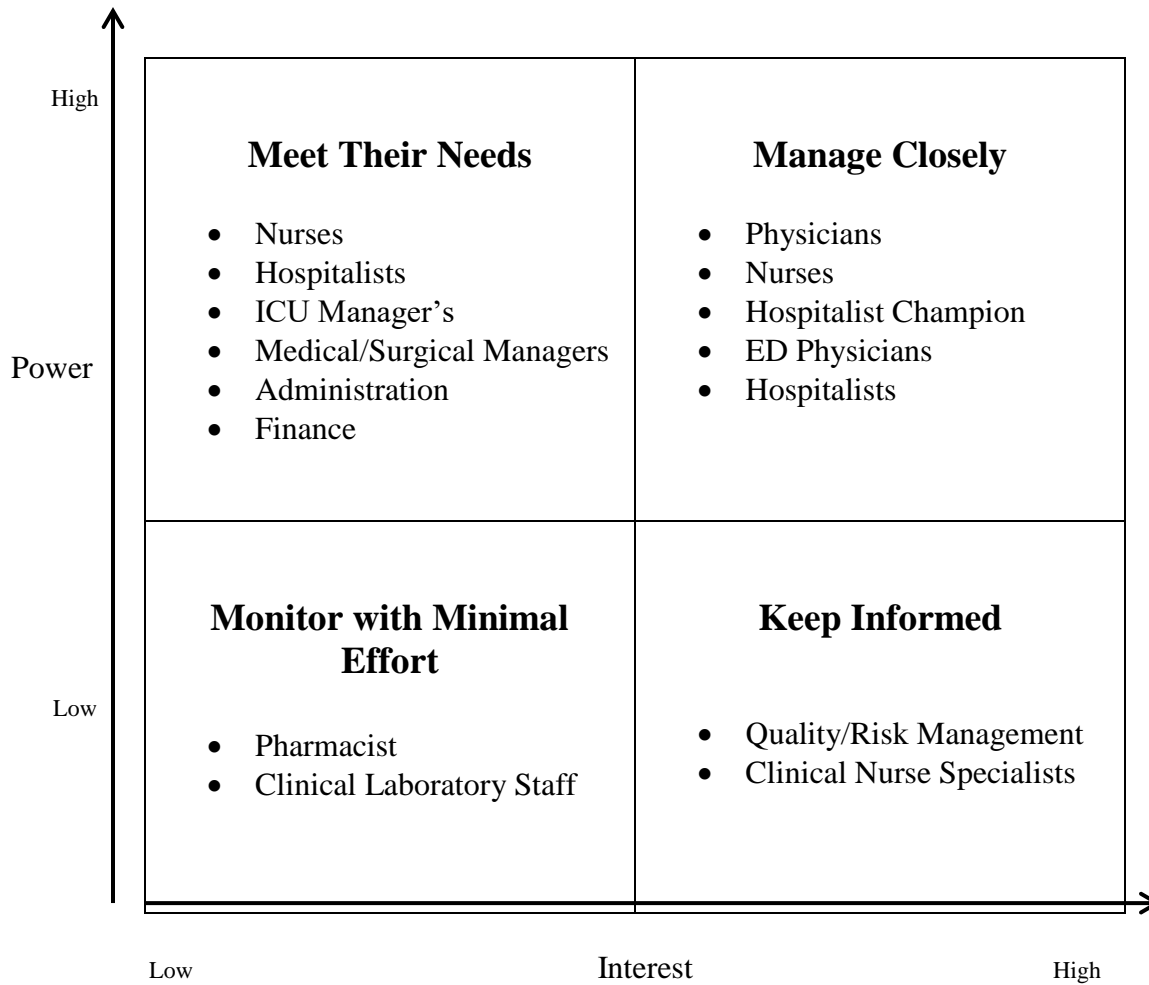
← Nursing Staff ←
- Education
- Early Recognition

← Audits ←
- Severe Sepsis Core Bundle
- Chart Audits

← Patient ←
- Decreased length of stay
- Decreased mortality

Appendix H

Severe Sepsis/Septic Shock Flowsheet

Severe Sepsis Suspected	One Organ Dysfunction			Severe Sepsis
Two SIRS criteria	Lactate > 2.0 mmol/L	Two SIRS criteria & One Organ Dysfunction = Severe Sepsis Presentation	Lactate > 4.0 mmol/L and/or MAP < 65 = Septic Shock	Broad spectrum antibiotic in 3 hours/
Temperature > 38.3 C or < 36.0 (> 100.9 or < 96.8 F)	SBP < 90 mmHg or MAP < 65 mmHg			Septic Shock add 30 ml/kg crystalloid fluids in 3 hours
Heart rate (pulse) > 90	Bilirubin > 2.0 mmg/dl			
Respirations > 20 per minute	Creatinine > 2 mg/dl			
White blood cell count > 12,000 or < 4,000				

Appendix I

Stakeholder Analysis

High		

Meet Their Needs

- Nurses
- Hospitalists
- ICU Manager's
- Medical/Surgical Managers
- Administration
- Finance

Manage Closely

- Physicians
- Nurses
- Hospitalist Champion
- ED Physicians
- Hospitalists

Power

Monitor with Minimal Effort

- Pharmacist
- Clinical Laboratory Staff

Keep Informed

- Quality/Risk Management
- Clinical Nurse Specialists

Low

Low   Interest   High

Appendix J

Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis

STRENGTHS	WEAKNESSES
• Outstanding staff • Healthcare quality • Nursing administration support • Electronic technology to alert staff • Collaboration among staff	• Early signs of sepsis are not always easy to recognize • Knowledge of sepsis needs improvement • Electronic alerts not being recognized by staff • Staff uncomfortable alerting physicians
OPPORTUNITIES	THREATS
• Increase staff education regarding sepsis • Increase staff recognition of sepsis • Increase staff communication • Increase of patient satisfaction • Excellent quality of care • Better comfort level with electronic technology • Decrease patient length of stay • Decrease patient mortality	• Staff ignoring sepsis electronic alerts • Missing signs/symptoms of sepsis • Increase in patient length of stay • Increase in patient mortality • Noncompliance

Appendix K

PDSA CYCLE

AIM: To increase early sepsis recognition with nurses on the medical-surgical floor by November 2018 with an 80% compliance.

PDSA cycle 4: Act: Determination if survey, education has assisted staff.

Data   PDSA cycle 3: Study: Analyze core severe sepsis bundle data from CMS to see if

early recognition of sepsis is occurring with nurses on medical-surgical floor.

PDSA cycle 2: Do: Nursing staff using templates on WOW's, notifying physician.

PDSA cycle 1: Plan: Pre project sepsis survey with nursing staff. Early sepsis recognition

education.

Appendix L

Return of Investment

Description	Calculation per month	Calculation per year
Decrease in patient length of stay (LOS)	Expected number of patient days decreased in a month = 1 day	Expected number of days decreased in a year = 12 days
Cost of staff education to medical/surgical unit	Cost of staff education in huddles. Number of staff x time x hourly rate. 70 x 0.0625 (3.75 minutes) x $65 = $284.38	Annual cost for staff education in huddles. $284.38 monthly cost x 12 months = $3,412.56
Cost of survey monkey and reference materials	$200.00	$200.00
Annual cost to hospital		$3612.56
Calculated revenue to hospital with savings per patient	Savings per patient with 1 day decreased length of stay (LOS) from early sepsis recognition = $4,500.00	Total savings annually for 12 patient's with 1 day decreased length of stay with early sepsis recognition annually = $54,000.00
Calculated return of investment (ROI)		Total revenue – total cost: $54,000 – 3,612.56 = 51,525.00
Estimated annual savings for 12 patients		$50, 387.44 *

*Savings would be higher with each day length of stay is decreased

Appendix M

PROTECT YOUR
PATIENTS FROM SEPSIS.

GET AHEAD of SEPSIS
KNOW THE RISKS. SPOT THE SIGNS. ACT FAST.

Infections put your patients at risk for sepsis. Be alert to the signs and, when suspected, act fast.

Sepsis is the body's extreme response to an infection. It is life-threatening, and without prompt treatment, often rapidly leads to tissue damage, organ failure, and death.

SEPSIS STATS

More than
1.5 MILLION
people get sepsis
each year in the U.S.

At least
250,000
Americans die from
sepsis each year

About
1 IN 3 PATIENTS
who die in a hospital
have sepsis

WHAT CAUSES SEPSIS?

The most frequently identified pathogens that cause infections that can develop into sepsis include *Staphylococcus aureus* (staph), *Escherichia coli* (E. coli), and some types of *Streptococcus*.

Four types of infections that are often linked with sepsis:

| Lungs (e.g., pneumonia) | Urinary tract (e.g., kidney) | Skin | Gut |

Anyone can get an infection, and almost any infection can lead to sepsis. Some people are at higher risk of infection and sepsis:

WHO IS AT RISK?

65+
Adults 65
or older

People with chronic
medical conditions,
such as diabetes, lung
disease, cancer, and
kidney disease

People with
weakened
immune
systems

Children
younger
than one

WHAT ARE THE SIGNS OF SEPSIS?

Signs of sepsis can include any one or a combination of the following:

Confusion or disorientation	Shortness of breath	High heart rate	Fever, or shivering, or feeling very cold	Extreme pain or discomfort	Clammy or sweaty skin

HOW CAN I GET AHEAD OF SEPSIS?

Healthcare professionals can:

- **Know sepsis signs** to identify and treat patients early.
- **Act fast** if you suspect sepsis.
- **Prevent infections** by following infection control practices (e.g., hand hygiene, catheter removal) and ensuring patients receive recommended vaccines.
- **Educate your patients and their families about:**
    - Preventing infections.
    - Managing chronic conditions.
    - Keeping cuts clean and covered until healed.
    - Recognizing early signs of worsening infection and sepsis and seeking immediate care if signs are present.

Sepsis is a medical emergency. Protect your patients by acting fast. Your patients' risk of death increases with delayed recognition and treatment of sepsis.

WHAT SHOULD I DO IF I SUSPECT SEPSIS?

Know your facility's existing guidance for diagnosing and managing sepsis.

- **Immediately alert the clinician in charge if it is not you.**
- **Start antibiotics as soon as possible, in addition to other therapies appropriate for the patient.**
- **Check patient progress frequently.** Reassess antibiotic therapy within 24-48 hours to stop or change therapy as needed. Be sure antibiotic type, dose, and duration are correct.

Learn more about sepsis and how to prevent infections: **www.cdc.gov/sepsis**.

KNOW THE RISKS. SPOT THE SIGNS. ACT FAST.

PubNo. 300422

Sepsis arises when the body's response to an infection injures its own tissue and organs.

It will lead to shock, multiple organ failure and death, if not recognized and treated promptly!

Appendix N

Pre/post Severe Sepsis Implementation Survey:

When I get report from the ED <u>on a sepsis patient</u>, I get all the information I need to care for the patient:

- o   Always
- o   Almost always
- o   Sometimes
- o   Rarely
- o   Never

When I get report from the ED on a sepsis patient, I make sure to ask about (click all that apply):

- o   Labs
- o   IV Fluids
- o   Blood cultures
- o   Antibiotics given

Signs to look for with severe sepsis (click all that apply):

- o   Temperature > 38.3 C or < 36.0 C
- o   Heart rate (pulse) > 90
- o   Respirations > 20 per minute
- o   White blood cell count > 12,000 or < 4,000
- o   Bands > 10%
- o   Systolic blood pressure < 90
- o   Mean arterial pressure < 65 (MAP)
- o   Decrease in systolic blood pressure by > 40 mmHg
- o   Creatinine >2.0
- o   Urine output < 0.5 ml/kg/hour for 2 hours
- o   Bilirubin > 2 mg/dl
- o   Platelet count <100,000
- o   INR > 1.5
- o   PTT > 60 sec
- o   Lactate > 2 mmol/L

Appendix O

Reference cards that are posted on the workstations

Severe Sepsis Screening Elements
Patient history suggests a **documented or potential infection**?
Patient presents with **2 or more** of the criteria listed below: Temp < 36.0 C/96.9 F   Temp > 38.3 C/ 100.9 F   HR > 90   R > 20 WBC < 4,000   WBC > 12,000   Bands > 10%
Patient has evidence of **at least** one **acute** organ dysfunction due to infection? SBP< 90   MAP < 65   SBP decrease > 40 from baseline   Platelet < 100,000 Creatinine > 2 without CKD   Urine output <0.5ml/kg/hr x2hr   INR > 1.5 or a PTT > 60 sec Bilirubin >2 mg/dl   Lactate >2 mmol/L
If patient meets the above criteria – **CALL their PHYSICIAN**

Appendix P

Sepsis worksheet for admission of a new patient

Sepsis protocol – questions to ask during report:

If the patient is admitted with an infection (pneumonia, cellulitis, etc), ask:
Does the patient have sepsis? Are we suspecting sepsis?

- Has the lactate level been ordered/completed?
- Have the blood cultures been ordered/completed?
- Have antibiotics been ordered/given?
- If the initial lactate was over 2, has a repeat lactate level been ordered/completed?
- If yes, has a fluid bolus been given (30 ml/kg)? Is one needed?
  - If not all was given, how much is left to give?

Appendix Q

First Journal & Huddle post for survey

Good morning/evening,

You have received a survey monkey questionnaire in your email. Please take the time to fill this out. If you prefer a paper copy is also available on your unit. There are three short questions. Your feedback is important, because your responses will be used to facilitate increased communication between the Emergency Department Nursing Staff and your unit when you receive a patient transfer. Thank you.

Second Journal & Huddle post

Good morning/evening,

Thank you for taking the time to take the sepsis survey. There are some new sepsis posters in the breakroom for you to review. Please take a moment to read them. If your patient has two of the following; temperature > 38.3 or under 36.0, heart rate > 90, respirations > 20, WBC > 12,000 or under 4,000, or > 10% bands with any one organ dysfunction; SBP < 90, MAP <65, Creatinine > 2, Bilirubin > 2, platelet count < 100,000, INR > 1.5, PTT > 60, Lactate >2 with a suspected source of infection, your patient may have sepsis.

Appendix R

IHI Measures

Measures	Data Source	Target
Outcome Measures • Early sepsis recognition for patients by the nursing staff with treatment	Quality Department Sepsis Core Measure Bundle	80% monthly minimum
• Treatment will be blood cultures, antibiotics, fluids under three hours of sepsis criteria met	Quality Department Sepsis Core Measure Bundle	80% monthly minimum
• Decreased length of stay for patients with severe sepsis	Quality Department patient length of stay report	<5 days
Process Measures • Early recognition and treatment within 3 hours of severe sepsis presentation	Medical-surgical floor audits	80%
• If meeting 80% target, reduction in length of patient stay	Quality Department patient length of stay report	80% or greater
Balancing Measure • Decreased length of stay for patients • Increased readmission rates from premature discharge	Quality Department patient length of stay report Quality Department readmission within 30 days report	Decreased overall length of stay to under 5 days Under 10%

Appendix S

Bioethical decision model by Thompson and Thompson

10-step process

Step 1: Review the situation to determine health problems, decision needed, ethical components, and key individuals.

Step 2: Gather additional information to clarify the situation.

Step 3: Identify the ethical issues in the situation.

Step 4: Define personal and professional moral positions.

Step 5: Identify moral positions of key individuals involved.

Step 6: Identify value conflicts, if any.

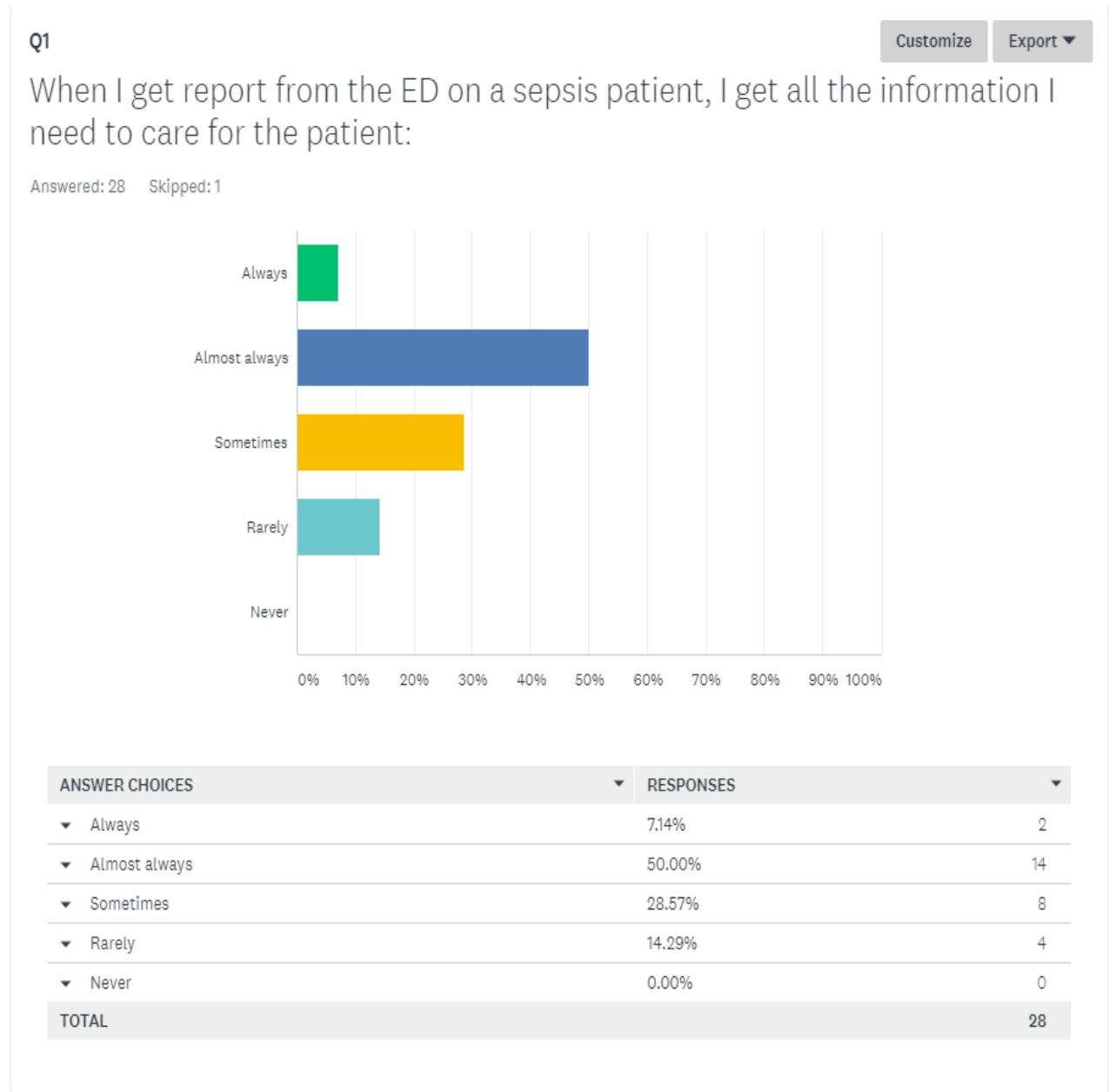Step 7: Determine who should make the decision.

Step 8: Identify range of actions with anticipated outcomes.

Step 9: Decide on a course of action and carry it out.

Step 10: Evaluate/review results of decision/action. (Thompson & Thompson, 1981)

Appendix T

Survey Questions and Responses

Q1   Customize   Export ▼

When I get report from the ED on a sepsis patient, I get all the information I need to care for the patient:

Answered: 28   Skipped: 1

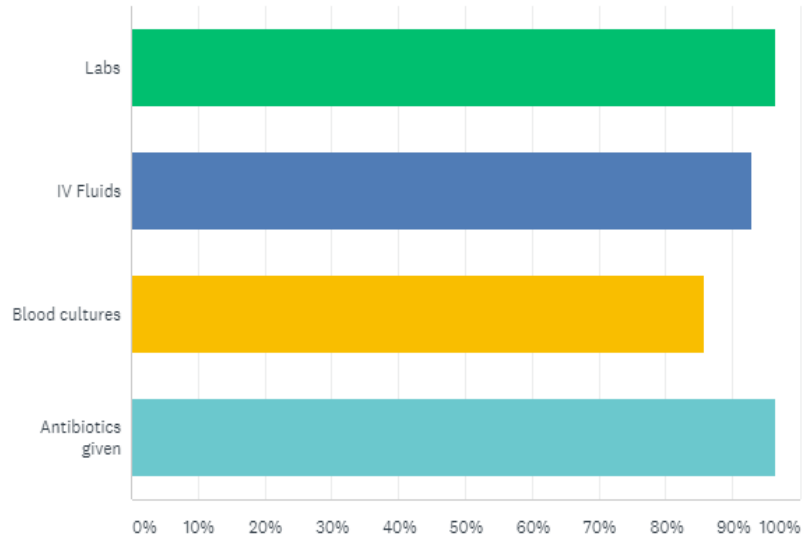| ANSWER CHOICES	RESPONSES	
▼ Always	7.14%	2
▼ Almost always	50.00%	14
▼ Sometimes	28.57%	8
▼ Rarely	14.29%	4
▼ Never	0.00%	0
TOTAL		28

Q2

Customize | Export ▼

When I get report from the ED on a sepsis patient, I make sure to ask about (click all that apply):

Answered: 28   Skipped: 1

ANSWER CHOICES	▼	RESPONSES	▼
▼ Labs		96.43%	27
▼ IV Fluids		92.86%	26
▼ Blood cultures		85.71%	24
▼ Antibiotics given		96.43%	27
Total Respondents: 28			

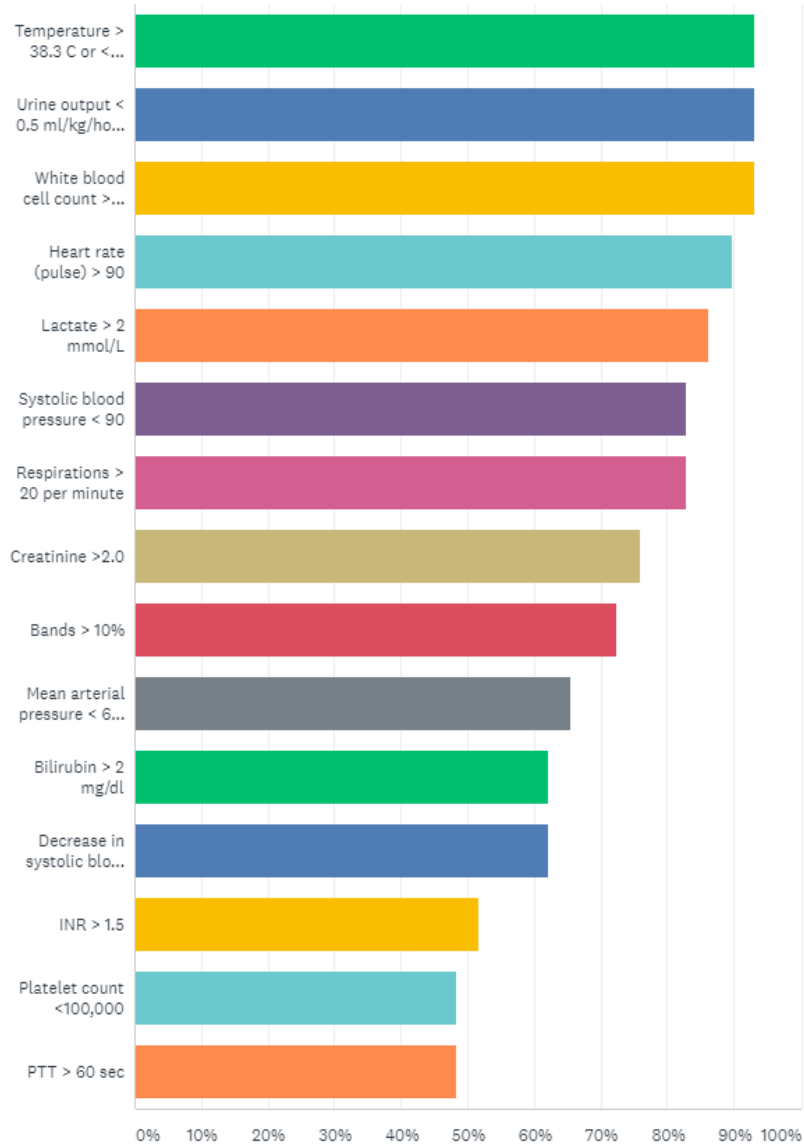**Q3**

Customize   Export ▼

Signs to look for with severe sepsis (click all that apply):

Answered: 29   Skipped: 0

ANSWER CHOICES	RESPONSES	
▼ Temperature > 38.3 C or < 36.0 C	93.10%	27
▼ Urine output < 0.5 ml/kg/hour for 2 hours	93.10%	27
▼ White blood cell count > 12,000 or < 4,000	93.10%	27
▼ Heart rate (pulse) > 90	89.66%	26
▼ Lactate > 2 mmol/L	86.21%	25
▼ Systolic blood pressure < 90	82.76%	24
▼ Respirations > 20 per minute	82.76%	24
▼ Creatinine >2.0	75.86%	22
▼ Bands > 10%	72.41%	21
▼ Mean arterial pressure < 65 (MAP)	65.52%	19
▼ Bilirubin > 2 mg/dl	62.07%	18
▼ Decrease in systolic blood pressure by > 40 mmHg	62.07%	18
▼ INR > 1.5	51.72%	15
▼ Platelet count <100,000	48.28%	14
▼ PTT > 60 sec	48.28%	14
Total Respondents: 29		

Appendix U

Project Timeline

Early Sepsis Recognition on Medical Floors										
Year 2018-2019	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan
Assess need for change	▓									
Link problem intervention		▓								
Synthesize best evidence		▓	▓							
Design practice change			▓	▓						
Implement and Evaluate					▓	▓	▓			
Integrate and maintain								▓	▓	▓

Appendix V

Outcome Measures Results

Measures	Data Source	Target/Goal	Results
Outcome Measures • Early sepsis recognition for patients by the nursing staff with treatment	Quality Department Sepsis Core Measure Bundle	80% monthly minimum	June 30, 2018 90% - 1 patient delay in recognition in June
• Treatment will be blood cultures, antibiotics, fluids under three hours of sepsis criteria met	Quality Department Sepsis Core Measure Bundle	80% monthly minimum	June 30, 2018 90% - 1 patient antibiotics and 30 ml/kg crystalloid fluids not given in 3 hours after severe sepsis presentation
• Decreased length of stay for patients with severe sepsis	Quality Department patient length of stay report	Less than 5 days	Goal not met- average length of stay is around 7 days for sepsis patients
Process Measures • Early recognition and treatment within 3 hours of severe sepsis presentation	Medical-surgical floor audits	80% monthly minimum	June 30, 2018 90%
• If meeting 80% target, reduction in length of patient stay	Quality Department patient length of stay report	80% or greater	June 30, 2018 Goal at 90%, but length of stay not reduced
Balancing Measure • Decreased length of stay for patients	Quality Department patient length of stay report	Decreased overall length of stay to under 5 days	June 30, 2018 Goal not met- 7 days
• Increased readmission rates from premature discharge	Quality Department readmission within 30 days report	Under 10% for sepsis patients	June 30, 2018 Goal not met – readmission rate is 12%

Appendix W

Charter

The mission statement for the hospital is commitment to furthering the healing ministry of Jesus. Resources are dedicated to providing compassionate, high-quality, affordable health services. This includes advocating for the poor and disenfranchised, and working with the community to improve the quality of life.

Aim

The CMS Severe sepsis bundle audits were averaging around 80% compliance every month.   In October 2017, compliance went down to 55%, further review of the charts showed the medical-surgical floor staff was not recognizing the severe sepsis signs and treatment was being delayed. The aim of this project is for early recognition and recommended treatment for medical-surgical floor patients within 3 hours of presentation of severe sepsis signs. A goal for the early treatment will be for decreased length of stay and mortality.

Background

The hospital is licensed for 370 beds. There is an average of 200 patients diagnosed with sepsis in the hospital every month. This project will be on a 30 bed medical surgical unit. The majority of the patients are on the unit for CHF, COPD, GI bleed, pneumonia, cellulitis, UTI, and renal complications. The average age is 66 years old. The majority of the patients who are admitted have Medi-Cal, which has a lower rate of reimbursement to the hospital. The hospital also has a large amount of psych and substance abuse patients. The daily patient census for the floor is around 24 and the average length of stay is between four to five days.

The medical-surgical nursing staff includes Registered Nurses, Nursing Assistants, and Unit Assistants. The staffing ratio is 1-5. The nursing degrees are varied on the floor from associate degrees up to PhD's. The nursing staff vary from new grads to experienced nurses. The staff also has a very diverse cultural mix.

Patient rounding is completed every morning with the attending physician and the patient nurse for the shift. The manager also rounds every day to follow up on any questions, concerns, and complaints the patient may have regarding their hospitalization. Every patient has a care coordinator nurse who works with the patient's potential discharge needs from admission to discharge. A social worker is assigned if needed.

Measures

The expected results are for the hospital to have bundle results consistently at a minimum of 80% every month. This will be measured by the abstracted severe sepsis audits from the Quality Department meeting the Centers for Medicare and Medicaid (CMS) bundle requirement. This is the identification or suspicion of severe sepsis and recommended treatment within three hours of the patient meeting the severe sepsis symptoms. The measurement of a decreased length of stay and patient mortality will be from reports produced by the Quality Department.

Driver Diagram

The aim is to increase nursing staff early recognition of severe sepsis on the medical-surgical floor up to 80% by November 2018 (Appendix G).

Sponsors/Team

The severe sepsis team at the hospital is a large dynamic team. This includes nurse

managers, directors, laboratory manager, nursing administrator, physicians, quality,

pharmacy, and physician vice president.

Measurement Strategy

The Institute for Healthcare Improvement strategy is being used for this project.

Data for the entire hospital goals are attached (Appendix X).

Timeline

This project is starting in April 2018 and expected results of a minimum of 80% by

November 2018 (Appendix T).

Appendix X

Measurement Strategy

Data will be from Quality Department Core Measures, and Corporate Goals for the hospitals.

These goals are for the entire hospital.

Definition

Data Element	Definition
Early management of the severe sepsis bundle	CMS core measure regarding blood cultures, lactate, broad spectrum antibiotic, crystalloid fluids (if MAP < 65 or lactate > 4mmol/L) within 3 hours of presentation of severe sepsis.
Length of stay for patient with sepsis, severe sepsis or septic shock diagnosis	Average length of stay for patients with sepsis, severe sepsis or septic shock diagnosis every month.
Readmission within 30 days of discharge	Patient readmission within 30 days of discharge from hospital.
Mortality	Patient expired in hospital with diagnosis of sepsis, severe sepsis, or septic shock.

Measure definition

Measure	Measure Definition	Data Source	Measurement Goal
Early management of the sepsis bundle	CMS Core Measure for Severe Sepsis	Quality Department/CMS Core Measures	80% hospital wide
Length of stay	Average length of stay for patients with sepsis, severe sepsis, septic shock	Quality Department Datavision	< 5 days
Readmission within 30 days of discharge	Patient readmission with sepsis as main diagnosis	Quality Department Datavision	< 10 patients a month
Mortality from sepsis, severe sepsis, septic shock	Patient expired from sepsis, severe sepsis, septic shock	Quality Department Datavision	<10 patients a month

Appendix Y

EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST *

STUDENT NAME: **Robin Haynes**

DATE: May 25, 2018

SUPERVISING FACULTY: Carlee Balzaretti

Instructions: Answer YES or NO to each of the following statements:

Project Title: Early Recognition Severe Sepsis Presentation	YES	NO
The aim of the project is to improve the process or delivery of care with established/ accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.	X	
The specific aim is to improve performance on a specific service or program and **is a part of usual care**. ALL participants will receive standard of care.	X	
The project is **NOT** designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does **NOT** follow a protocol that overrides clinical decision-making.	X	
The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does **NOT** develop paradigms or untested methods or new untested standards.	X	
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does **NOT** seek to test an intervention that is beyond current science and experience.	X	
The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP.	X	
The project has **NO** funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	X	
The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., **not** a personal research project that is dependent upon the voluntary participation of colleagues, students and/ or patients.	X	
If there is an intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: *"This project was undertaken as an Evidence-based change of practice project at X hospital or agency and as such was not formally supervised by the Institutional Review Board."*	X	

ANSWER KEY: If the answer to **ALL** of these items is yes, the project can be considered an Evidence-based activity that does NOT meet the definition of research. IRB review is not required. Keep a copy of this checklist in your files. If the answer to ANY of these questions is **NO**, you must submit for IRB approval.*Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partners Health System, Boston, MA