Resocialization of an Inpatient Handoff Sepsis Bundle Checklist on a Medical-Surgical Unit

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Resocialization of an Inpatient Handoff Sepsis Bundle Checklist on a Medical-Surgical Unit

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NURS 653: Internship

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# Table of Contents

Section I: Abstract.................................................................................................................................................. 4

Section II: Introduction............................................................................................................................................ 5
  Problem Description........................................................................................................................................... 6
  PICO question.................................................................................................................................................. 7
  Literature Review............................................................................................................................................ 7
  Available Knowledge..................................................................................................................................... 7
  Search Strategy............................................................................................................................................... 10
  Conceptual Framework................................................................................................................................. 10
  Rationale......................................................................................................................................................... 11

Section III: Methodology....................................................................................................................................... 12
  Project Overview............................................................................................................................................ 12
  Context............................................................................................................................................................ 12
  Microsystem Assessment............................................................................................................................... 12
  Plan, Do, Study, Act (PDSA) Cycle................................................................................................................ 13
  Root Cause Analysis (RCA).......................................................................................................................... 14
  Strength, Weaknesses, Opportunities, Threats (SWOT) Analysis................................................................. 15
  Cost-Benefit Analysis (CBA)........................................................................................................................ 15
  Timeline of Project........................................................................................................................................ 16
  Interventions............................................................................................................................................... 16
  Study of Interventions................................................................................................................................. 17
  Measures....................................................................................................................................................... 17
  Ethical Considerations................................................................................................................................. 18
Abstract

**Problem:** In September 2023, it was found that only 25% of nurses were familiar with an inpatient handoff sepsis bundle checklist (IHSBC) on a Medical-Surgical Unit in Hospital A. This evidence-based project aimed to improve resocialization of the IHSBC such that compliance to the bundle could continue to be maintained well above the benchmark of 75%.

**Context:** Clinical Nurse Leader (CNL) students at the University of San Francisco conducted a microsystem assessment of the Medical-Surgical Unit at Hospital A. This hospital aimed to maintain high rates of compliance with the IHSBC.

**Interventions:** Resocialization of the IHSBC was completed in October, and November, 2023. Additionally, the IHSBC was made available throughout the unit so that it was more accessible. It was placed on the break room bulletin board, in binders containing information pertaining to sepsis, and in various clear file holders on the unit.

**Measures:** A pre-intervention verbal survey and post-intervention verbal survey were conducted to confirm the issue at hand and also to measure effectiveness of resocializing the IHSBC.

**Results:** Post-intervention results revealed that familiarity of the IHSBC increased from 25% to 60%. Furthermore, it was also discovered that some of the new travel nurses did not receive information about the IHSBC during orientation.

**Conclusion:** This study confirmed the importance of socializing the IHSBC and that socialization should continue, following this study as well. Furthermore, it is recommended that socialization of the IHSBC should be required during orientation for all new hire nurses, and socialization should be done once a month during the beginning of shift huddles.

*Key Words: Sepsis, Sepsis bundle, sepsis protocol, septic shock, severe sepsis, bundle, adherence, medical-surgical, quality improvement.*
Resocialization of an Inpatient Handoff Sepsis Bundle Checklist on a Medical-Surgical Unit

Sepsis is a life-threatening condition in which an infection causes an organ system or systems to dysfunction (Hunt, 2019). In the United States, Sepsis causes approximately 270,000 deaths annually and also costs about 38 billion dollars per year (Hollenbeak et al., 2023). The most common infections that lead to sepsis start in the lungs, gastrointestinal system, urinary tract, and skin (CDC, 2022). The risk factors for sepsis include a suppressed immune system, age over 75 or very young, wounds or compromised skin, a recent surgery, childbirth, pregnancy, patients with an indwelling line or catheter, and patients with underlying medical conditions such as diabetes, splenectomy, and long-term steroid use (Hunt, 2019). Signs and symptoms of sepsis include tachycardia, fever, a very cold sensation, cold clammy skin, diaphoresis, shivering, shortness of breath, extreme discomfort or pain, and confusion (CDC, 2022). When patient’s present to the Emergency Department, significantly altered vital signs or compromised urine output are indications of organ dysfunction and could likely be a result of sepsis (Hunt, 2019). Sepsis is often diagnosed by the healthcare provider when a combination of the following criteria is present: evidence of infection, abnormalities with clotting factors, low oxygen saturation, abnormal kidney and liver function, and electrolyte imbalances (Mayo Clinic, 2023).

Treatment is predominantly achieved with antibiotics to treat the underlying infection, fluids for hydration and to help combat hypotension, and vasopressors to help increase blood pressure (Mayo Clinic, 2023). One important aspect of antibiotic administration for sepsis patients is timeliness, especially for patients who present to the emergency department. Delayed antibiotic administration has been associated with higher mortality rates along with longer hospital lengths of stay, and complications such as acute kidney injury and acute lung injury (Alrashed et al., 2022). One retrospective cohort study showed that when the antibiotic
piperacillin-tazobactam was given IV push, rather than IV piggyback, there was a significant reduction in administration time (Alrashed et al., 2022). An additional risk factor for sepsis patients is vitamin D deficiency which can also lead to longer length of hospital stay. Another retrospective cohort study showed that a vitamin-D supplement for patients with sepsis significantly reduced mortality rates for patients in the ICU (Yang et al., 2023).

Receiving care in a timely manner is critical for sepsis patients. Utilizing a sepsis bundle helps to streamline care, and has been shown to decrease sepsis mortality rates and total direct costs for patients that have severe sepsis or septic shock (Leisman et al., 2017). Because of these benefits of adhering to a sepsis bundle, an inpatient handoff sepsis bundle checklist (IHSBC) was introduced to a Medical-Surgical Unit at Hospital A. One of the priorities of hospital A was to maintain IHSBC compliance above the benchmark of 75%. Hospital A was able to maintain compliance at 92% for severe sepsis and septic shock patients, and in order to maintain and even improve this excellent level of compliance, this quality improvement project investigated the level of socialization of the IHSBC on both a quantitative and qualitative level. Additionally, as part of the initiative to spread awareness of sepsis during September 2023 for sepsis awareness month, posters and flyers that explained facts about sepsis were distributed throughout the units at Hospital A.

**Problem Description**

In November 2022, an inpatient handoff sepsis bundle checklist that outlines necessary steps to follow, once a patient is diagnosed with sepsis was introduced to the Medical-Surgical Unit at Hospital A. Specifically, the two parts of the IHSBC include components of time zero to three-hour elements, as well as time zero to six hour elements (See Appendix A). In September 2023, an evaluation of the Medical-Surgical Unit was completed, which included surveying the
Resocialization of an Inpatient Handoff Sepsis Bundle Checklist on a Medical-Surgical Unit

Floor, and checking to see if the sepsis bundle checklist could be found on the crashcarts, on the break room bulletin board, and in a binder on the unit. The checklist was not found in any of these locations. Additionally, in September 2023, during the morning huddle on the Medical-Surgical Unit, only 25% of nursing staff were aware of the IHSBC. Additionally, only 12.5% of the nursing staff identified that the IHSBC was socialized two weeks ago. It was identified that both knowledge of the IHSBC and socialization of the IHSBC had declined. It was thus identified that resocialization of the bundle checklist was necessary in order to maintain sepsis bundle adherence above the benchmark of 75%.

**PICO question**

A PICO question was formed which clearly states the patient population involved (P), the intervention (I), comparison intervention (C), and outcome (O). The PICO question serves as the base for the other steps that follow for this evidence based practice project (King & Gerard, 2016). The PICO question is as follows: Among staff in a Northern California Medical-Surgical unit (P), what is the effect of resocializing an Inpatient Handoff Sepsis Bundle Checklist (I), in comparison to no resocialization (C), on increased bundle utilization (O)?

**Literature Review**

**Available Knowledge**

A literature review was conducted in order to see whether a pilot study was necessary to test the interventions being implemented or to identify evidence based interventions on sepsis management that could be used in the context of this quality improvement project (See appendix C). The Johns Hopkins Research Evidence Appraisal Tool was utilized to categorize the studies’ level of evidence (Dang et al., 2022). The literature that was reviewed showed the benefits associated with implementing a sepsis bundle, screening tools, and communication tools in
RESOCIALIZATION OF AN INPATIENT HANDOFF SEPSIS BUNDLE CHECKLIST ON A MEDICAL-SURGICAL UNIT

helping to increase efficient management and care of sepsis patients, decrease mortality rates, and decrease associated costs for sepsis patients. The literature guided this project by proving the need for the continued resocialization of the sepsis bundle checklist.

One observational study showed the effect of implementing a screening tool for the early detection of sepsis (Gyang et al., 2015). For this study, 2,143 screening tests were conducted for 245 patients in a medical-surgical unit, 39 of which had positive results for sepsis. Of the 39 patients, 49% had positive results for severe sepsis while 51% had standard sepsis (Gyang et al., 2015). The sensitivity of this screening tool was 95% while the specificity was 92%. This study showed that in general, utilizing a sepsis screening tool can be beneficial for the early detection of sepsis (Gyang et al., 2015).

A prospective multisite observational cohort study determined that full compliance with an aggressive 3-hour sepsis bundle decreased rates of mortality and cost in comparison to when full compliance of the bundle was not completed (Leisman at al., 2017). Data from 3 cohorts of severe sepsis and septic shock patients was used in this study. For cohort 1, the mortality rate for patients who received bundle compliant care was 21.3% whereas patients that received care that was non-compliant with the bundle had a mortality rate of 25.4%. For cohort 2, the compliant group had a 13.4% mortality rate in comparison to 17.8% in the non-compliant group. For cohort 3, the compliant group had a 18.1% mortality rate in comparison to 21% in the non-compliant group. The total direct costs (TDC) was lower for the compliant group in both cohort 2 and 3 (Leisman at al., 2017). This study in particular should be highlighted as it directly shows the benefit of the implementation of this quality improvement project wherein the inpatient handoff sepsis bundle checklist is resocialized.
A descriptive study found that sepsis hour-1 bundle compliance by a tertiary care hospital in Sri Lanka was low and mortality rates were high (Matthias et al., 2020). This study analyzed data on 387 sepsis patients. 83.7% were direct admissions to this hospital while 16.3% of these patients were transfers from another hospital. Compliance of IV fluids was 10.9%, blood cultures before antibiotics was done 58.1% of the time, the first dose of antibiotics was given 3.9% of the time and arterial blood gas labs were drawn 60% of the time. The mortality rate for these patients was 9.6%. In order to decrease mortality rates, it was recommended that this hospital increase compliance to the hour-1 bundle as recommended by the Surviving Sepsis Campaign (Matthias et al., 2020).

One retrospective observational study aimed to find the effects of sepsis bundle adherence on in-hospital mortality (Milano et al., 2018). The subjects of this study were patients from three different Los Angeles County Department of Health hospitals. 4,582 sepsis patients and their outcomes were studied. Patients that received care that adhered to the sepsis-bundle had overall lower mortality rates than those that did not receive care that adhered to the bundle. For these patients, pneumonia was the most common source that led to sepsis, and adherence to the bundle for these patients was statistically significant (Milano et al., 2018). This study should also be highlighted as one that relates closely to this quality improvement project, as it proves that socialization, and in turn adherence to the sepsis bundle checklist is beneficial to decrease mortality rates associated with sepsis.

A prospective cohort study determined that in low-volume patient units, better adherence to a sepsis bundle and its components was found when provider-to-provider telehealth was utilized in a rural emergency department (Mohr et al., 2021). In particular, adherence was higher for the components of drawing lactate, fluid resuscitation, and giving antibiotics. For this study,
the data of 655 emergency department patients in rural hospitals was analyzed. 5.6% of patients in this study received telemedicine consults. Adherence to the sepsis bundle was higher for patients that received telemedicine consults then those that did not with a p<0.001 (Mohr et al., 2021).

A systematic review aimed to describe components of sepsis protocols and compliance with these protocols and whether this affected hospital length of stay as well as mortality rates associated with sepsis (Taj et al., 2022). Additionally, since resources differ globally, this study also examined barriers and facilitators of implementing sepsis protocols. This systematic review yielded six studies that were relevant to the objective. The six studies that were relevant to the objective identified that mortality rates of sepsis decreased significantly when a sepsis protocol was even slightly adhered to. Additionally, compliance with the protocols were found to have increased with education (Taj et al., 2022).

**Search Strategies**

The strategies used to search for these articles were through databases such as CINAHL (Cumulative Index to Nursing and Allied Health Literature) as well as Pubmed and Scopus. The keywords used included: Sepsis, sepsis bundle, signs and symptoms, sepsis tools, medical-surgical, quality improvement, checklist. Some of the filters used in the search for these articles were “peer reviewed” and “English language.”

**Conceptual Framework**

The change theory that was at the core of this quality improvement project is Kurt Lewin’s Theory of Change. Lewin identified that in order for a change to take place a certain level of energy must be applied to the system in order for the system to overcome inertia and in order to apply this energy in an efficient way (Harris et al., 2018). Lewin came up with three
stages of implementation in order to bring about change. These three stages are Unfreeze, Change, and Refreeze. During the Unfreeze stage, certain processes must be made aware and enough energy must be put into the system to motivate change (Harris et al., 2018). For this Quality improvement project the Unfreeze stage consisted of bringing about awareness of the existence of the IHSBC, resocializing the IHSBC, and explaining the consequences that occur when there is lack of adherence to the IHSBC. Additionally, this phase consisted of showing the IHSBC to new staff and travel nurses that were not aware of it. The change phase occurs when individuals are offered options to implement change or to follow by way of a role model (Harris et al., 2018). For this stage, change was implemented by ensuring that the nurses were using the introduced IHSBC. There were no fallouts to bundle use by the end of October 2023, which showed that the IHSBC was being used. The Refreeze phase happens when the implemented change is maintained, without unintentionally phasing out (Harris et al., 2018). For this quality improvement project, the Refreeze phase consisted of ensuring that awareness of the IHSBC was maintained.

**Rationale**

The aim of this evidence based quality improvement project is to resocialize the inpatient handoff sepsis bundle checklist in the Medical-Surgical Unit in Hospital A. By resocializing, compliance to the IHSBC will increase and fallouts of adherence to the IHSBC will decrease. In turn, sepsis patients will receive care in a more timely manner, and severe complications can be prevented. After resocialization of the IHSBC has been completed, the process of compliance to the IHSBC begins at time zero when the patient has been diagnosed with sepsis and ends with adherence to all components of the IHSBC. The goal after the intervention has been
RESOCIALIZATION OF AN INPATIENT HANDOFF SEPSIS BUNDLE CHECKLIST ON A MEDICAL-SURGICAL UNIT

implemented is that 50% of nurses will be familiarized with the checklist from an initial assessment baseline of 25%.

Methodology

Project Overview

A 5P’s (Purpose, Patients, Professionals, Process, and Patterns) microsystem assessment was conducted and a Plan, Do, Study, Act (PDSA) Cycle was utilized for structure of the project. For analysis of data pertaining to this evidence-based practice project, a root cause analysis (RCA) and Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis was conducted.

Context

The purpose of this quality improvement project is to ensure that the inpatient handoff sepsis bundle checklist is being utilized and socialized in a Medical-Surgical Unit at Hospital A which is part of a large healthcare organization in Northern California. By ensuring utilization and awareness of the IHSBC, sepsis patient care management will be done more effectively in the Medical-Surgical Unit. This would ensure that patients do not develop higher acuity symptoms that would make transfer to the ICU inevitable.

Microsystem Assessment

The Microsystem was assessed using the 5P’s (Purpose, Patients, Professionals, Process, and Patterns). The purpose of the quality improvement project is to support the Medical-Surgical unit microsystem in sepsis care, as a part of the initiative to maintain IHSBC adherence at the macrosystem level. The patient’s involved in the microsystem of interest were the Medical-Surgical patients that were diagnosed with sepsis. The target professionals for this quality improvement project were the nurses, however, in order for the socialization of the bundle to be successful, it is also important that the patient care technicians, nursing assistants,
physicians, nurse practitioners, phlebotomists, and respiratory therapists also understand the purpose of the IHSBC and how critical it is for the IHSBC to be socialized. The process involves thoroughly resocializing the sepsis bundle checklist. The process also involves knowing when time zero is whether before or after admission to the Medical Surgical unit. If time zero started in the Emergency department, then IHSBC adherence starts in the Emergency Department. If time zero begins after admission to the Medical-Surgical unit, then the process of adhering to the IHSBC begins after admission. The process also involves following up with the patient if sepsis was successfully treated so that readmission for sepsis does not occur. Some of the patterns that were seen on the unit were that the travel nurses did not receive training or introduction of the IHSBC during orientation. Additionally, there were quite a few travel nurses on the night shift and thus the percentage of those that were not familiar with the IHSBC was higher.

**Plan, Do, Study, Act (PDSA) Cycle**

As shown in Appendix D, this project was divided into 4 phases (PDSA or Plan, Do, Study, Act). During the Plan phase, an objective, PICOT question, and aim statement was established. During this phase collaborating with the staff on the Medical-Surgical unit in hospital A was initiated in order to assess knowledge of the IHSBC on the unit. Additionally during this phase, a script was written and content of information to be socialized was decided. During the Do phase, the microsystem (Medical-Surgical Unit) was assessed using the 5P’s assessment. Additionally, a SWOT analysis was performed which examined the strengths, weaknesses, opportunities, and threats related to compliance and socialization of the IHSBC on the medical-surgical unit. Additionally, an RCA (Root Cause Analysis) was performed in order to understand the underlying issue that was causing difficulty with socialization of the IHSBC. Finally, qualitative and quantitative data was collected regarding familiarity of the IHSBC. The
RESOCIALIZATION OF AN INPATIENT HANDOFF SEPSIS BUNDLE CHECKLIST ON A MEDICAL-SURGICAL UNIT

checklist was also placed on the bulletin board in the breakroom of the Medical-Surgical unit, and in various binders on the unit.

During the Study phase, post-intervention data was collected and levels of compliance with the sepsis bundle was monitored. Additionally post-intervention data was analyzed and trends in the data as well as effects of resocializing the IHSBC was analyzed. During the Act phase, the post-intervention data continued to be collected, observations were made in regards to methods of resocialization of the sepsis bundle and methods of intervention were modified as needed. In particular, a more succinct overview in describing the importance of complying to the IHSBC was reconstructed such that time was not wasted when speaking to each nurse individually and also when resocializing the IHSBC during the morning huddle.

Root Cause Analysis (RCA)

A root cause analysis (RCA) was conducted in order to determine the issues that were at the core of the lack of consistency in socializing the IHSBC in the Medical-Surgical unit at Hospital A. A fishbone diagram in Appendix I shows the main causes of the issue at hand. Some of the identified issues included that the IHSBC was not found on the unit. Specifically, it was not found in the crashcarts or on the bulletin boards, or in the breakroom. Additionally, a binder containing basic information about sepsis was not found on the unit. This decreased opportunities for the staff to familiarize themselves with the IHSBC. Additionally, it was also recognized that newly onboarded travel nurses did not receive any information about the IHSBC during onboarding. Furthermore, it was also identified that there were not any specific alerts that would remind the nurses when specific components of the IHSBC needed to be completed. It was also determined that the IHSBC was not properly integrated into the workflow, making it difficult for nurses to incorporate these tasks into their practice.
Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis

A SWOT analysis was conducted in order to identify specific areas of improvement and strengths and opportunities to expand upon (see appendix E). Some of the Strengths that were identified in the SWOT analysis were that the Medical-Surgical unit staff were well educated on sepsis, and during sepsis awareness month in September 2023, flyers that contained facts about sepsis could be seen along the nurse stations and various parts of the unit. Several other strengths identified included that the nurse educators worked closely with the quality nurse consultants to continue to improve socialization and adherence to the IHSBC, and leadership was collaborative and supportive.

Some of the Weaknesses that were identified included that only 60% of the nurses knew about the IHSBC even after the intervention, and that socialization and education about the IHSBC was not conducted during travel nurse orientation. Additionally, when best practice alerts regarding tasks that must be completed for sepsis patients appeared in the electronic system, overrides were possible. Some of the Opportunities that were identified included, increasing utilization of the IHSBC, decreasing complications, morbidity, and mortality for patients diagnosed with sepsis, and reducing hospital costs associated with care for sepsis patients. Some of the identified Threats included time and financial constraints in creating opportunities for nurses to be resocialized on the IHSBC and that not all of the staff involved in care of sepsis patients were given a list of patients with sepsis including the phlebotomists that play a crucial role of drawing labs at the appropriate time.

Cost-Benefit Analysis (CBA)

A Cost-Benefit Analysis for this evidence-based practice project was done. As noted in Appendix F, the estimated cost of resocializing the sepsis bundle checklist is $0.00 per year. The
estimated cost of printing sepsis bundle checklists and compiling documents pertaining to sepsis into a binder is $100.00 per year. As such, the total estimated cost for implementation of this evidence-based practice project is approximately $100.00 per year. The average cost that is saved when a sepsis patient receives care that is compliant to a sepsis bundle is $1,571 (Leisman et al., 2017). Based on the estimation that the Medical-Surgical Unit receives about 2 sepsis patients per week, it is estimated that there will be approximately 104 sepsis patients admitted to the medical-surgical unit per year (52 weeks/year * 2 patients). The average cost savings per year for sepsis bundle compliant care compared to no compliance at all for this medical-surgical unit is $163,384 which was derived by the following calculation: 104*$1,571 = $163,384. As such it is shown that implementing this quality improvement project has the potential to significantly reduce costs. However it must be noted that some patients at Hospital A do receive bundle compliant care, and thus the bundle compliance data for Hospital A must also be considered when doing a more specific cost-benefit analysis.

Timeline

The timeline of this project spanned from August, 2023, to November, 2023. For purposes of organization and visualization, a Gantt Chart was created (Appendix G) to show the timeline for this project. Some of the major steps along the timeline of this project included compiling and forming a literature review, completing a microsystem assessment, collecting data on pre-intervention and post-intervention knowledge of IHSBC, and analyzing data.

Interventions

The interventions that were implemented, aimed to increase socialization of the IHSBC amongst staff, and primarily nurses on the Medical-Surgical unit at Hospital A. The specific interventions that were implemented included resocializing the IHSBC during a morning huddle
and explaining the benefit of adhering to the IHSBC. In particular, it was conveyed to the nurses that adhering to the IHSBC ensures that patients do not develop as many complications if treated in a timely manner. It was also explained that this would in turn, ensure that the patient could continue to receive care in the medical-surgical unit, rather than progressing to a more critical condition, which would require the patients to be transferred to the Intensive Care Unit (ICU).

Additionally, a sepsis binder that included pertinent information about sepsis was created (for instance information about mSIRS criteria or Modified Systemic Inflammatory Response Syndrome was included) and many copies of the IHSBC were added to the binder. This binder was then placed on the unit, where the other informational binders were also kept. Additionally, the IHSBC was added to the break room bulletin board, and various easily accessible file holders within the unit (See appendix H).

**Study of Interventions**

After the interventions are implemented, effects of the intervention were assessed using a pre-intervention survey and post-intervention survey. The data from these findings were compiled and analyzed. Furthermore, qualitative data, including information verbalized by the nurses were used as the basis for future suggestions.

**Measures**

A verbal pre-intervention survey and post-intervention survey were conducted for nurses and nursing staff on the Medical-Surgical Unit in hospital A. For the verbal pre-intervention survey, during a morning huddle, day shift nursing staff were asked if they knew about the sepsis bundle checklist. A count was taken of nursing staff that had awareness of the sepsis bundle and also those that did not. The post-survey was conducted similarly to the pre-survey, however the population was slightly different as nurses and nursing staff on the night shift became the
RESOCIALIZATION OF AN INPATIENT HANDOFF SEPSIS BUNDLE CHECKLIST ON A MEDICAL-SURGICAL UNIT

For the post-survey, the night shift nurses and nursing staff were asked the same question as in the pre-survey, but the timing was such that they were asked individually rather than as a group, and they were asked right before their shift ended. Some of the data that was considered was how long it had been since these nurses were onboarded and whether or not they had received information about the inpatient sepsis bundle checklist during orientation.

Ethical Considerations

This evidence-based project has been conducted under the guidance of the University faculty and fulfills the guidelines of an evidence based quality improvement project. The criteria for approval from the institutional review board are not met.

Results

Both qualitative and quantitative data was collected for this evidence-based project. For the pre-intervention verbal survey that was conducted in September 2023, 25% of nurses were aware of the sepsis bundle checklist and 12.5% of nurses recalled that it was recently re-introduced. During the pre-intervention verbal survey, one nurse said “I was told about it 2 weeks ago.” For the post-intervention verbal survey which was conducted in October, 2023 it was noted that 60% of nursing staff expressed familiarity with the IHSBC. The Assistant Nurse Manager specifically expressed that the IHSBC is “used as a tool and guide” on the medical-surgical unit. The remaining 40% of the nursing staff conveyed that they were not familiar with the IHSBC. Upon further inquiry, it was discovered that the 40% of the nurses that were not familiar with the checklist were travel nurses that were hired within the last few weeks. These travel nurses also expressed that the IHSBC was not introduced during their orientation. It was also observed that 20% of the respondents for the post-intervention survey initially were hesitant to respond. When the unit was observed post-intervention, the IHSBC remained on the
RESOCIALIZATION OF AN INPATIENT HANDOFF SEPSIS BUNDLE CHECKLIST ON A MEDICAL-SURGICAL UNIT

bulletin board in the breakroom in a very visible location and the binders on the units still contained multiple copies of the checklist.

Discussion

As noted in the results, the familiarity of the inpatient handoff sepsis bundle checklist increased from 25% before the intervention to 60% after the intervention on the Medical-Surgical Unit in Hospital A. Although the intervention helped to increase opportunities for IHSBC socialization, there is still a possibility that this increase was partially attributed to chance. As such it is necessary to continue to maintain socialization of the IHSBC. Another finding was that travel nurses are not given information about the bundle during orientation. Thus it can be recommended that all newly hired medical-surgical unit nurses, including travel nurses, should be required to receive training on the importance of utilizing the IHSBC. Additionally, another method to improve socialization would be for the nurse manager or nurse educator to spend a few minutes during the start of shift huddle to resocialize the IHSBC and explain its importance. It is the hope that in the future, this evidence-based practice project will be further expanded, such that effects of improving socialization of the IHSBC on the compliance of the IHSBC are determined. Additionally, it is recommended that adherence to the IHSBC is supported both through maintenance of socialization efforts as well as through improvement of informatics utilization. For instance, when an alert related to sepsis care appears wherein a task must be completed, overrides should not be possible unless under extreme and well rationalized circumstances.

Limitations

Some of the limitations that were noted was the small sample size and the short duration of time in which to complete this evidence based practice project. For the small sample size, due
to facility policies in scheduling dates for project facilitators to visit the unit and also due to the limited time that the nursing staff could interact with the study facilitators, participation was limited. Additionally, the pre-survey nursing staff that participated during the initial resocialization differed from the staff that completed the post-survey evaluation, again due to facility limitations on when study facilitators could visit and when nursing staff were available. However it should be noted that this resocialization of nurses from different shifts enabled a more comprehensive resocialization of the IHSBC. Since this study was conducted by Clinical Nurse Leader (CNL) students during the semester, it was also inevitable that the study was conducted over the short duration of approximately four months and it is likely that if the intervention phase was longer, there would be more opportunity for resocialization of the inpatient handoff sepsis bundle checklist.

Summary

The aim of this evidence-based quality improvement project was to improve socialization of the inpatient sepsis bundle checklist on a Medical-Surgical Unit in Hospital A. In order to establish this aim, a PICO question was developed, and the microsystem was assessed. A pre-intervention survey was conducted to confirm the suspected problem. Once the needs of the microsystem was identified, the IHSBC was resocialized, and post-intervention data was collected. The process involved initiating a PDSA cycle, and once results were collected, a SWOT analysis and CBA were completed. It was noted that the percentage of nurses that were familiar with the sepsis bundle checklist increased from 25% pre-intervention to 60% post-intervention. Although this can be partially attributed to the intervention, it is still necessary to continue to maintain resocialization efforts. Furthermore, qualitative data revealed that travel
nurses were not being introduced to the IHSBC during orientation, which clarified the need for socialization of the IHSBC during orientation as well.

**Conclusion**

By resocializing the inpatient handoff sepsis bundle checklist, the opportunity to increase compliance to the bundle becomes possible, which in turn can help to decrease morbidity, mortality, and costs associated with care of sepsis patients in the Medical-Surgical Unit at Hospital A. Even in this short span of time from the initial assessment in September 2023, to the final assessment in October 2023, it was possible to see improvement in ability to resocialize the sepsis bundle checklist. It is the hope that the results of this evidence based project sheds light on the need to restructure and incorporate socialization and education on the IHSBC for new hire nurse orientations. It is also the hope that improvements in nursing technology informatics can be made such that more stringent criteria are in place if a nurse is to override an alert regarding care of a septic patient. Finally, efforts to continue to improve resocialization of the IHSBC should be continued, as decreased socialization can lead to higher rates of fallouts to bundle compliance.
References


RESOCIALIZATION OF AN INPATIENT HANDOFF SEPSIS BUNDLE CHECKLIST ON A MEDICAL-SURGICAL UNIT


Appendix A

Inpatient Handoff Sepsis Bundle Checklist
(Not a permanent part of the medical record)

Patient: ___________________________ Date: ______________

Time Zero (discovery of sepsis): ____________

Initial Lactate Result: ____________

Time Zero to 3-hour bundle elements:

☐ Target fluid bolus (actual or ideal wt based) completed
   Remaining volume to be given: ______________

☐ NICOM (Noninvasive Cardiac Output Monitor) indicated?
   NA Competed Need

Time Zero to 6-hour:

☐ Repeat lactate if initial lactate >1.9
   Due to be collected: ______________

☐ Check BP/MAP x2 1hr post fluids
   Last BP/MAP: ______________

☐ Provider notified for persistent hypotension
   (if SBP<100 or MAP <65)

☐ Vasopressor ordered/given (in ED or ICU only)
Appendix B

SEPSIS AWARENESS MONTH
September 2023

**THIS SEPTEMBER, TAKE THE TIME TO KNOW THE SIGNS**

More than 80% of sepsis patients are 50 years of age or older.

**TIME**

- Temperature that’s abnormal
- Signs of an infection
- Mental Decline
- Feeling extremest ill

For every hour treatment is delayed, the risk of death increases by as much as 8%. If you suspect sepsis, seek urgent medical care.

**Sezeptember**
SepsisAwarenessMonth.org

**THIS SEPTEMBER, TAKE THE TIME TO KNOW THE SIGNS**

More children die of sepsis than pediatric cancers.

- Any child who:
  - Feels abnormally cold to the touch
  - Looks mottled, bluish, or has very pale skin
  - Has a rash that does not fade when pressed
  - Is breathing very fast
  - Has a convulsion (seizure)
  - Is very lethargic or difficult to wake up

- A child under 5 who:
  - Is not eating
  - Is vomiting repeatedly
  - Has not urinated in 12 hours

For every hour treatment is delayed, the risk of death increases by as much as 8%. If you suspect sepsis, seek urgent medical care.

**Sezeptember**
SepsisAwarenessMonth.org
Appendix C

Literature Synthesis Table

<table>
<thead>
<tr>
<th>Study Authors</th>
<th>Objective and Design</th>
<th>Sample &amp; Setting</th>
<th>Results</th>
<th>Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gyang, Shieh, Forsey, &amp; Maggio (2015).</td>
<td>For this observational study, the effects of implementing a screening tool for the early detection of sepsis was studied.</td>
<td>2143 screening tests were conducted for 245 patients in a medical-surgical unit.</td>
<td>Of the 245 patients, 39 had positive results for sepsis. Of the 39 patients, 49% had positive results for severe sepsis while 51% had standard sepsis. The sensitivity of this screening tool was 95% while the specificity was 92%. This study showed that in general, utilizing a sepsis screening tool can be beneficial for the early detection of sepsis.</td>
<td>Level III (Dang et al., 2022)</td>
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<tr>
<td>Leisman, Doerfler, Ward, Masick, Wie, Gribben, Hamilton, Klein, Bianculli, Akerman, D’Angelo, &amp; D’Amore (2017)</td>
<td>This prospective multisite observational cohort study aimed to determine whether full compliance with an aggressive 3-hour sepsis bundle would decrease rates of mortality and would also decrease costs in comparison to when full compliance of the bundle was not completed.</td>
<td>Data from 3 cohorts of severe sepsis and septic shock patients was used in this study. Each cohort consisted of patients from one to several different hospitals. The first, second, and third cohort consisted of 5,819, 1679, and 7,239 patients respectively.</td>
<td>For cohort 1, the mortality rate for patients who received bundle compliant care was 21.3% whereas patients that received care that was non-compliant with the bundle had a mortality rate of 25.4%. For cohort 2, the compliant group had a 13.4% mortality rate in comparison to 17.8% in the non-compliant group. For cohort 3, the compliant group had a 18.1% mortality rate in comparison to 21% in the non-compliant group.</td>
<td>Level IV (Dang et al., 2022)</td>
</tr>
</tbody>
</table>
Matthias, Indrakumar, Ranasinghe, Wijekoon, & Yashodara (2020). This descriptive study aimed to determine sepsis hour-1 bundle compliance as recommended by the Surviving Sepsis Campaign (SSC) in a tertiary care hospital in Sri Lanka.

This study analyzed data on 387 sepsis patients at a tertiary care hospital in Sri Lanka. 83.7% were direct admissions to this hospital while 16.3% of these patients were transfers from another hospital. Compliance of IV fluids was 10.9%, blood cultures before antibiotics was done 58.1% of the time, the first dose of antibiotics was given 3.9% of the time and arterial blood gas labs were drawn 60% of the time. The mortality rate for these patients was 9.6%. The study concluded that the compliance rates were low and mortality rates were high, and thus measures must be taken to be more compliant with the hour-1 bundle.

Milano, Desai, Eiting, Hofmann, Lam, Menchine, & (2018). This retrospective observational study was done at several different hospitals. This study aimed to study the effects of sepsis bundle adherence on in-hospital mortality.

The subjects of this study were patients from three different Los Angeles County Department of Health hospitals. 4,582 sepsis patients and their outcomes were studied. Patients that received care that adhered to the sepsis-bundle had overall lower mortality rates than those that did not receive care that adhered to the bundle. For these patients, pneumonia was the most common source that led to sepsis, and adherence to the bundle for these patients was statistically significant.
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Description</th>
<th>Findings</th>
<th>Study Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mohr, Campbell, Swanson, Ullrich, Merchant, &amp; Ward (2021)</td>
<td></td>
<td>This prospective cohort study determined whether there was better adherence to a sepsis bundle and its components when provider-to-provider telehealth was utilized in a rural emergency department. In particular, adherence to 4 components of the bundle were analyzed including lactate measurements between 3 hours, ensuring that blood cultures are taken before starting antibiotics, ensuring that broad spectrum antibiotics are given, and ensuring that adequate fluid resuscitation is initiated.</td>
<td>The data of 655 emergency department patients in rural hospitals was analyzed for this study. 5.6% of patients in this study received telemedicine consults. Adherence to the sepsis bundle was higher for patients that received tele-medicine consults then those that did not with a p&lt;0.001. In particular, adherence was higher for the components of drawing lactate, fluid resuscitation, and giving antibiotics. The study concluded that in low-volume patient units, provider-to-provider telemedicine will cause greater adherence to a sepsis bundle.</td>
<td>Level IV (Dang et al., 2022)</td>
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<td>Taj, Brenner, Sulaiman, &amp; Pandian (2022)</td>
<td></td>
<td>This systematic review aimed to describe components of sepsis protocols and compliance with these protocols and whether this affected hospital length of stay as well as mortality rates associated with sepsis. Additionally, since resources differ globally, this study also examined barriers and facilitators of implementing sepsis protocols.</td>
<td>This systematic review yielded six studies that were relevant to the objective. These studies described protocols that were utilized in recognition of early sepsis warning signs in areas where resources were restricted. The six studies that were relevant to the objective identified that mortality rates of sepsis decreased significantly when a sepsis protocol was even slightly adhered to. Additionally, compliance with the protocols were found to have increased with education.</td>
<td>Level II (Dang et al., 2022)</td>
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Appendix D

Plan, Do, Study, Act (PDSA) Cycle

**Plan**
- Collaborated with stakeholders at Hospital A regarding knowledge of the Inpatient Handoff Sepsis Bundle Checklist
- Created a PICO question and specific aim statement
- Created a script to present during the preliminary data collection

**Do**
- Assessed the Medical-Surgical Units using the 5Ps
- Performed a SWOT analysis
- Placed Inpatient Handoff Sepsis Bundle Checklist in the microsystem
- Collected qualitative and quantitative data

**Act**
- Continue to collect and observe data post-intervention and implement necessary adjustments

**Study**
- Analyze data from post resocialization
- Will analyze the effect of resocialization on checklist utilization and compliance
Appendix E

Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis

**STRENGTHS**
- Staff are knowledgeable and informed on sepsis recognition and management
- Sepsis awareness month flyers are available as a resource on the unit
- Nurse educator works closely with quality nurse consultants
- Best Practice Alerts notifies nurses if a patient is exhibiting S/S related to sepsis
- Supportive leadership

**WEAKNESSES**
- Less than 50% of nurses had knowledge regarding the Inpatient Handoff Sepsis Bundle Checklist
- Staff are able to override the Best Practice Alerts
- Lack of sepsis bundle compliance re-training
- Resistance or hesitancy to change from some staff nurses
- The unit has several travel nurses who were not oriented on the checklist due to time constraints

**OPPORTUNITIES**
- Increase utilization of the Inpatient Handoff Sepsis Bundle Checklist
- Improve patient care
- Decrease the number of complications related to sepsis
- Decrease sepsis mortality/morbidity rate
- Reduce hospital costs

**THREATS**
- Time restraints to inform nurses of bundle checklist
- Cost allocated to resocialize nurses
- Staff turnover and burnout
- Some nurses are reluctant to use the bundle checklist
- Lab does not get a list of sepsis patients which may affect early recognition
Appendix F

Cost-Benefit Analysis (CBA)

Estimated Cost of Sepsis Re-Socialization:
$0.00 per year

Estimated Cost of Sepsis Information Binder and Flyers:
$100.00 per year

**Total Estimated Cost: $100.00 per year**

**Compared To:**

The Total Average Cost Savings for the Medical-Surgical Unit when the patient is given sepsis bundle compliant care: 2*52*1,571 = **$163,384**

Estimated number of patients admitted to the Medical-Surgical unit per week: 2 patients

Weeks per year: approximately 52 weeks

Cost savings per patient per year when given sepsis bundle compliant care: $1,571 (Leisman et al., 2017).
Appendix G

Gantt Chart

<table>
<thead>
<tr>
<th>Task Title</th>
<th>Start Date</th>
<th>End Date</th>
<th>August Week</th>
<th>September Week</th>
<th>October Week</th>
<th>November Week</th>
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<td>Project Initiation</td>
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<td>Coordinate with stakeholders to visit the facility</td>
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<td>Project Implementation</td>
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<td>Conduct pre-survey with non-clinical departments</td>
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<td>Perform non-clinical department education on sepsis</td>
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<td>Conduct pre-survey with inpatient (Med-Surg &amp; ICU) staff</td>
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<tr>
<td>Perform inpatient (Med-Surg &amp; ICU) staff re-education on sepsis bundle checklist</td>
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<td>Place sepsis resources (binder and checklist copies) on the Med-Surg unit</td>
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<td>Project Evaluation and Synthesis</td>
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<td>Meet with relevant staff to solidify plan for post-survey</td>
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<td>Data analysis</td>
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Appendix H

Interventions done on the Medical-Surgical Unit

Placing the Inpatient Handoff Sepsis Bundle Checklist on the Medical-Surgical unit:

Placing the Inpatient Handoff Sepsis Bundle Checklist on the educational board in the Medical-Surgical unit break room:
New sepsis binder found on the unit post-resocialization of the Inpatient Handoff Sepsis Bundle Checklist during Sepsis Awareness Month:
Appendix I

Root-Cause Analysis (RCA)/Fishbone Diagram