Educating Medical-Surgical Nurses in a Large Hospital Organization on Sepsis: Bundle Elements

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Educating Medical-Surgical Nurses in a Large Hospital Organization on Sepsis: Bundle Elements

Grace Jenks

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NURS-653-32: Internship

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May 3rd, 2023
Abstract

Problem: Based on the findings of a pre-survey conducted, it was observed that around 6% of the Medical-Surgical nurses who participated from Hospital A possessed "expert knowledge" of the "inpatient handoff sepsis bundle checklist." The results highlight the potential for educating and boosting the confidence of nurses working in a healthcare organization located in Northern California, enabling them to provide better care for patients afflicted with sepsis.

Context: The microsystem is a Medical-surgical unit situated within Hospital A, which is one of the 21 hospitals located in Northern California. Dr. Theresa Mostasisa conducted a survey on February 15, 2023, which included responses from 17 nurses working in this unit.

Interventions: Providing a nurse education through presenting a handout during an all-staff meeting can enhance awareness regarding sepsis and improve the knowledge and confidence of nurses in managing patients afflicted with this condition.

Measures: The team intends to conduct a pre-survey and post-survey using a volunteer and anonymous RN sepsis self-assessment tool to assess RN sepsis knowledge and confidence in recognizing and managing sepsis patients. The survey comprises six questions, with five of them scored on a scale of 0 to 5 to yield quantitative results. The remaining question is scenario-based and will be analyzed qualitatively.

Results: Similar studies found that provider sepsis education will increase knowledge by 21% and confidence by 11% upon post-survey.

Conclusion: Nurse education successfully improves provider confidence and knowledge. The project can be applied to other hospital units once a protocol has been established. Suggestions for continuing the project include conducting a post-education survey and incorporating hands-on training in addition to verbal education for nurses.
Educating Medical-Surgical Nurses in a Large Hospital Organization on Sepsis:

Bundle Elements

Sepsis presents a multitude of difficulties for the current healthcare system and is regarded as a medical emergency. According to medical experts, sepsis is a condition in which an individual's body responds abnormally and extremely to an infection (van der Poll, 2021). Severe sepsis is characterized by metabolic, circulatory, and cellular abnormalities, as well as organ dysfunction, which poses a greater risk of mortality than sepsis alone (Sepsis Alliance, 2022). Septic shock occurs when the blood pressure also drops in addition to the organ damage (Sepsis Alliance, 2022). Despite many years of research and clinical trials, sepsis treatment remains primarily supportive, focusing on timely administration of antibiotics, resuscitation, source control, and supportive care for organ dysfunction (van der Poll, 2021). These supportive measures have been organized into 3- and 6-hour bundle elements (Afshar et al., 2022). Compliance to the bundle elements has been demonstrated to improve hospital mortality (Afshar et al., 2022).

Sepsis is responsible for a significant proportion of deaths and illness in hospitalized patients and presents a challenge to healthcare systems. According to the Centers for Disease Control and Prevention (CDC), sepsis is a critical medical condition affecting over 1.7 million adults in the United States (CDC, 2022). Disturbingly, at least 350,000 of those adults either die from sepsis during their hospital stay or are transferred to hospice care (CDC, 2022). Even more alarming, sepsis plays a role in one out of every three hospital deaths (CDC, 2022). Furthermore, the long-term effects of sepsis can cause individuals to lose their ability to participate in their previous activities, resulting in a decreased quality of life (van der Poll, 2021). These alarming statistics reveal the extent to which sepsis affects our healthcare system.
Besides causing significant mortality and morbidity, sepsis is also expensive for the healthcare system in the United States, with an approximate cost of $62 billion per year (Sepsis Alliance, 2022). The cost of hospitalization for sepsis is twice as much as the average cost for other medical conditions (Sepsis Alliance, 2022). Additionally, sepsis is the leading cause of hospital readmissions, resulting in an annual expense of over $3.5 billion (Sepsis Alliance, 2022). A study has shown that non-present-on-admission sepsis incurs greater costs compared to early-diagnosed sepsis, with a cost range of $39,336 for sepsis without organ dysfunction to $68,671 for septic shock per case, demonstrating a significant financial healthcare burden (Cecconi et al., 2018). The delayed diagnosis and treatment of sepsis, which is known to negatively impact outcomes, may contribute to these higher costs (Cecconi et al., 2018). Timely detection and treatment of sepsis, prior to the onset of organ failure, results in reduced mortality rates and ultimately lower costs (Paoli et al., 2018). Therefore, early treatment of sepsis will decrease healthcare expenditures.

**Problem description**

In the context of a Northern California hospital, Hospital A, sepsis is a fatal complication of infection that poses a threat to patient care and safety. Hospital A is a part of a network of twenty-one hospitals and has prioritized the treatment of sepsis. The hospital has adapted a standardized approach for sepsis that comprises of uniform elements for supportive measures in 3- and 6-hour bundles that are intended to enhance the management of acute sepsis and mitigate mortality rates associated with sepsis. The hospital network utilizes regional dashboards comparing the network’s quality measures, including sepsis bundle compliance. Furthermore, the hospital system aims to achieve high levels of care quality and considers sepsis treatment and education as aligning with their objectives (2021 Annual Report). In addition to posing a threat
to patient care and safety, sepsis is a costly condition for the hospital to treat. Hospital A values affordable healthcare and prioritizes preventative measures (2021 Annual Report).

Early detection and prompt treatment of sepsis are critical in avoiding adverse outcomes and decreasing costs. Adherence to bundle elements has been shown to reduce both mortality rates and length of hospital stays associated with sepsis in a cost-effective manner (Afshar et al, 2019). Nurses play a crucial role in identifying and initiating these sepsis treatments. Research shows that education and training programs can enhance nurse’s confidence in caring for sepsis patients (Chua et al., 2022). Additionally, another study suggested that implementing education and quality-improvement programs to enhance outcomes is the best way to manage sepsis outcomes (Cecconi et al., 2018).

A pre-survey conducted at Hospital A in Northern California identified an opportunity to improve the knowledge and confidence levels of nurses in sepsis education. While 82 percent of nurses reported confidence in explaining sepsis definition, risk factors, and causes, only 53 percent felt confident enough to teach sepsis. Additionally, only 6 percent of medical-surgical nurses reported expert knowledge in the inpatient handoff sepsis bundle checklist, and around 35 percent reported expert knowledge in their confidence level to treat a septic patient. These benchmark data suggest that quality improvement in sepsis education for nurses is necessary. To address this issue, an educational intervention consisting of an informational sepsis handout will be provided to the nurses on the medical-surgical unit. The project aims to increase nurse knowledge and confidence levels in caring for sepsis patients at Hospital A.

**Literature Review**

**PICO Question**
In nurses on the medical-surgical unit at a Northern California hospital (P), what is the effect of additional education in the form of an informational sepsis handout (I), compared with no intervention (C), on increasing nurses’ knowledge and confidence in caring for sepsis patients (O)?

**Available Knowledge**

A literature review was conducted to examine nurse education and the result on care for patients with sepsis. The search for peer-reviewed articles from 2012 to 2023 was carried out using databases CINAHL and PubMed. Specific search terms included nurse education, sepsis, confidence, education, acute care, knowledge, management, and nursing. Out of the identified articles, six were found applicable to the PICO question. The articles were assessed using the John Hopkins Evidence-Based Practice guidelines, as presented in Appendix A (Dang & Dearholt, 2017).

According to Bleakly and Cole (2020), nurses have the ability to detect changes in physiological observations that may indicate the onset of sepsis. Understanding the pathophysiology of sepsis can aid nurses in recognizing the importance of rapid intervention (Bleakley & Cole, 2020). Utilizing clinical guidelines and sepsis screening tools are effective methods to decrease patient mortality rates and decrease septic shock (Bleakley & Cole, 2020). Familiarity with the "red flag" criteria for sepsis through early warning scores can lead to earlier recognition and time-sensitive interventions (Bleakley & Cole, 2020). Administering the "sepsis six" within one hour of suspected sepsis can save lives, which includes bundle elements of taking blood cultures, giving IV antibiotics, and measuring lactate (Bleakley & Cole, 2020). The study was a clinical practice guideline, from a viewpoint of experts that relied on scientific evidence.
The authors Breuer & Hassinger (2020) conducted a study to evaluate the impact of a multi-faceted quality initiative on provider knowledge, attitude, and behavior in recognizing and treating pediatric sepsis. The initiative included various educational platforms, such as sepsis "newsletters," posters highlighting protocol and screening strategies, and simulation sessions (Breuer & Hassinger, 2020). Participants who underwent the simulation sessions showed greater knowledge of diagnostic criteria for pediatric sepsis and septic shock, higher comfort levels with recognizing sepsis, and less hesitation to bring sepsis concerns to their care team (Breuer & Hassinger, 2020). The results suggested that a multidisciplinary curriculum could improve sepsis-related knowledge, attitude, and behavior among pediatric practitioners (Breuer & Hassinger, 2020).

A study by Chua et al. (2022) suggests that improving sepsis education and training programs and implementing sepsis screening tools and care bundles are crucial in enhancing nurses' knowledge and confidence in recognizing and managing patients with sepsis. The study was multi-site and cross-sectional (Chua et al., 2022). They found that working in acute care, a higher job grade, and specialized nursing education or master’s level education were correlated with higher knowledge about sepsis (Chua et al., 2022). The study recommended ongoing education and sepsis training for staff to improve compliance with sepsis clinical protocols (Chua et al., 2022).

A study by Damiani et al. (2015) states that performance improvement programs have been linked with increased adherence to resuscitation and management sepsis bundles, resulting in reduced mortality for patients with sepsis, severe sepsis, or septic shock. Education alone was able to improve compliance with the complete resuscitation and management bundles and was associated with a reduction in mortality (Damiani et al., 2015).
Edwards & Jones (2021) used a cross-sectional survey design which found that sepsis training for nurses resulted in improved attitudes, knowledge, and confidence when screening for sepsis and executing sepsis bundles. With proper education and training, nurses felt empowered to carry out sepsis screenings and bundles for early detection and management within an hour, which ultimately saved patient lives (Edwards & Jones, 2021).

Yousefi et al. (2012) conducted a quasi-experimental study and concluded that training significantly improved the knowledge, attitude, and practice of ICU nurses in sepsis care. Therefore, organizing seminars and continuous educational workshops for sepsis care are recommended for healthcare providers (Yousefi et al., 2012).

In conclusion, sepsis is a critical medical condition that demands rapid recognition and intervention. Nurses play a crucial role in the early detection and management of sepsis, which can prevent septic shock and improve patient outcomes. The literature supports the importance of sepsis education and training programs, as well as the utilization of clinical guidelines, screening tools, and care bundles to enhance nurses' knowledge and confidence in recognizing and managing sepsis patients. Overall, ongoing education and training, coupled with adherence to clinical protocols and the utilization of evidence-based interventions, can significantly improve sepsis management and ultimately save lives.

**Rationale**

The quality improvement project utilizes Kurt Lewin's Theory of Planned Change (TPC) as the change theory to guide the process. Lewin's three-stage change model, which involves unfreezing, change, and refreezing, is used to promote and sustain change within the microsystem (Mitchell, 2013). The first stage involves preparing for the change by assessing the current state, identifying the problem, providing evidence-based information, and engaging key
stakeholders to support the project (Mitchell, 2013). For this project, the nurses' knowledge gap in managing septic patients was identified through self-assessment surveys. The second stage involves implementing the desired change, which is achieved by creating a handout that addresses the nurses' knowledge gaps (Mitchell, 2013). Clear communication and staff engagement are crucial for successful implementation. The last stage, refreezing, involves embedding the change into existing practice standards and offering ongoing support to nurses (Mitchell, 2013). The project addresses refreezing by providing a master copy of the handout to the unit manager that can be circulated and displayed in all inpatient unit binders and bulletin boards. An evaluation is necessary to reflect upon the process, document problems encountered, and celebrate the achievement once the change is fully integrated into the microsystem.

**Specific project aim**

The aim is to enhance the medical surgical unit nursing staff's knowledge and confidence in managing sepsis by 25% in all five quantitative categories over three months, achieved by the presentation of an informational handout and encouragement of continuing education through Sepsis Alliance.

**Context**

The project's context underwent an evaluation process using a microsystem assessment and SWOT analysis. Microsystems are the fundamental units of healthcare systems and work on the frontlines. Clinical nurse leaders (CNLs) can enhance healthcare outcomes by identifying gaps of performance within a microsystem and implementing systems that decrease clinical workarounds and variability. In this case, the microsystem assessment was conducted on the medical-surgical unit.

**Microsystem Purpose**
Hospital A has set a mission to become a pioneer in healthcare transformation by delivering top-notch services while ensuring affordability and access to everyone (2021 Annual Report). The organization is driven by its core values that include enhancing the health of both their members and the communities they serve (2021 Annual Report). The medical-surgical unit is a microsystem within the hospital that strives to provide high-quality and cost-effective healthcare services to its patients.

**Microsystem Patients**

The microsystem's patient population consists of individuals who are acutely ill with various health conditions and comorbidities, such as infections, cardiac and respiratory issues, and chronic diabetes, as well as orthopedic and post-surgical patients. The unit has a capacity of approximately twenty-three patients at any given time, and utilizes a standard nurse-to-patient ratio.

**Microsystem Professionals**

Unit staff includes registered nurses, travel nurses, nurse practitioners, physicians, physicians assistants, hospitalists, certified nursing assistants, patient care assistants, janitorial staff, respiratory therapists, lab workers, EMTs, security, administrators, student nurses, physical therapists, dieticians, pharmacists, speech therapists, and volunteers. Each role is vital to the function of the microsystem and delivery of care to its patients.

**Microsystem Processes**

The medical-surgical microsystem team employs various processes to provide high-quality care to its patients. Each team member follows specific procedures to deliver care within their scope of practice. For instance, RNs offer treatments and care at the bedside, social workers link patients with resources that address social and emotional needs, and physicians diagnose
illnesses and prescribe medications. Additionally, the microsystem employs specific procedures for conducting clinical procedures such as IV insertion, medication administration, and foley catheter insertion. These processes are vital to the microsystem's daily workflow, and many are displayed throughout the unit in the form of diagrams, flow charts, and checklists.

**Microsystem Patterns**

The Medical-Surgical microsystem regularly assesses patterns to identify areas for improvement in care and cost reduction while enhancing patient outcomes. The Nurse Manager works with the Nurse Quality Consultant to share trends and patterns with the care team during staff huddles to ensure compliance with processes and policies for safer and more efficient patient care. The microsystem tracks the incidence rates of various infections, including CLABSI, C. diff, and CAUTI. The microsystem collects and analyzes data continuously to monitor the hospital's and microsystem's performance in terms of patient safety.

**SWOT Analysis**

To evaluate the implementation of the sepsis nurse education project, a SWOT (strengths, weaknesses, opportunities, and threats) analysis was conducted on the microsystem. This analysis focused on internal and external factors that may affect the success of the project. The strengths of the microsystem include that the majority of nurses (82%) feel confident in explaining the definition, risk factors, and causes of sepsis, and an inpatient handoff sepsis bundle checklist is already in place on the unit. However, weaknesses include that only 53% of nurses feel confident in teaching sepsis to others, only 5% of nurses consider themselves experts with the inpatient handoff sepsis bundle checklist, and only 35% of nurses have a high level of confidence in taking care of septic patients. There are opportunities to increase nurses' confidence and knowledge through educational materials such as handouts and videos, which
can supplement the existing sepsis education framework and the inpatient handoff sepsis bundle checklist. The education project is low cost and has a high potential to increase confidence and knowledge. However, there are also threats, such as the possibility of nurses being unwilling to participate in the education project and not truthfully rating their knowledge and confidence levels on the pre/post-survey. Other threats include staff turnover, staff burnout, and hesitancy to utilize the inpatient handoff sepsis bundle checklist. Appendix B provides a detailed SWOT analysis.

**Budget Plan**

The budget for the educational intervention in the Northern California hospital has been designed in a cost-effective manner. The handouts were created by the CNL students, and the all-nurse meeting will be during the staff nurses' work hours, which means that no additional costs will be required for this intervention. Therefore, the intervention will not incur any expenses.

**Communication Plan**

The communication strategy for the sepsis education intervention involves a ten-minute presentation during all-nurse meeting. The presentation will focus on integration of the educational handout and optional Sepsis Alliance continuing education course. Additionally, the surveys can be utilized to inform staff about the initiative.

**Gannt Chart**

A Gannt Chart was utilized to help the team make a timeline for the project. The project began in February with a microsystem assessment, survey of nursing staff, definition of topic and aim statement, identification of sponsor and key stakeholder, and analyzed survey data and research initiatives. Stakeholders were identified as the chief nursing officer, Hospital A’s executives, quality nurse coordinator or CNL, director of nursing, nurse manager, and the data
analysts. March was focused on producing and creating nurse educational sepsis training. Next, the sepsis training was presented to the staff. Going forward, it is recommended to receive feedback via a post-survey and analyze the need for further education. Please see Appendix C for a detailed Gantt Chart.

**Intervention**

From February to May 2023, a 14-week quality improvement project was implemented to improve medical-surgical staff nurses' ability to recognize and manage sepsis patients. The intervention began with a self-assessment pre-survey, which collected anonymous data on existing knowledge and confidence levels related to sepsis. CNL students utilized the data to create an educational plan that included a handout covering sepsis definition, risk factors, causes, nursing management, patient education, and sepsis bundle checklist elements. The handout was then presented to the microsystem nursing staff at an all-staff meeting in April. The presentation included a QR code to scan for furthering Continuing Education credits with Sepsis Alliance. The proposed budget plan for the intervention was low cost, as the educational materials were created online with graduate nursing students and the presentation was done during staff nurses' work hours. See Appendix D for the sepsis educational handout.

**Study of the intervention**

In a Northern California healthcare organization, a quality intervention project was conducted with 17 nurses using the "RN Sepsis Self-Assessment Survey" by Dr. Theresa Mostasisa. The survey consisted of six questions that collected both qualitative and quantitative data. Participants voluntarily agreed to participate in the anonymous study, which included a pre-test survey to establish baseline knowledge and confidence levels. Participants used a Likert scale ranging from 0 (no knowledge) to 5 (expert knowledge) to rate their responses to five out
of the six statements. The five statements evaluated were: "I can explain sepsis (definition, risk factors, and cause)," "I can recognize the difference between severe sepsis and septic shock," "I feel comfortable caring for a sepsis patient," "I can teach sepsis," and "I am familiar with the inpatient handoff sepsis bundle checklist." In the sixth question, participants were asked to respond to a patient case scenario and describe the nursing actions they would take. However, a post-test survey was not administered due to time constraints. It is recommended to do a post-survey using the same survey material after the educational intervention to evaluate the intervention's impact on nurses' knowledge and confidence levels. See Appendix E for the survey provided to the nurses.

**Measures**

The team intends to measure the outcome of medical-surgical nurses' self-assessment on their ability to provide care for sepsis patients. The survey consists of six questions, with five of them rated on a 0 to 5 scale to generate quantitative outcomes. The sixth question is scenario-based and will be evaluated qualitatively. Upon conducting the pre-survey, the team determined the mean, median, and range of each question and analyzed the scores to identify opportunities for enhancement. It is recommended that the same be done for a post-survey. Then, the team will also assess the percentage of improvement in the nurses' knowledge and confidence levels in explaining sepsis, distinguishing between severe sepsis and septic shock, providing education on sepsis, and their familiarity with the "Inpatient Handoff Sepsis Bundle Checklist."

**Results**

Since time constraints did not allow for a post-survey to be sent to the nurses following the educational intervention, hypothetical results will be utilized. A systematic review done by Choy et al. (2022) evaluated the result sepsis education among healthcare professionals. The
study included thirty-two studies and found that most educational programs were effective in improving knowledge (Choy et al., 2022). One study included in the systematic review was done by Yousefi et al. (2012), where knowledge scores after sepsis education to ICU nurses went up by 21%. Therefore, the team could expect similar results on our study. Another article in the systematic review focused on confidence, specifically focusing on reduction in hesitation. They found that hesitation reduction in providers after sepsis education decreased by 11.1%, or conversely, that the confidence improved by about 11% (Breuer & Hassinger, 2020). Again, the team could expect similar results on our study.

One thing to note is that the meta-analysis found that simulation and game-play were more effective measures of education when compared to more passive forms of education, such as traditional classroom teaching (Choy et al., 2022). Since our study mostly focused on passive education in the form of a presentation, it is recommended to include forms of active learning if future cohorts continue this project.

**Discussion**

Key findings from the project include feedback from the nurses on the unit about keeping the handout and any information simple. They reported that they are extremely busy, and too much detail can be confusing as they often do not have the time to really dig into the sepsis algorithms. This information helped guide our project from a two-page handout down to one-page. While the team was not able to get post-survey results, the team estimates that the presentation at the all-nurse meeting will help improve the nurse’s confidence and knowledge regarding sepsis and the bundle elements.

One factor that significantly contributed to the strength of the project was working with our clinical instructor, Dr. Theresa Mostasisa. Dr. Mostasisa is the sepsis coordinator at the
hospital and had connections with the unit manager the team presented our project to. She was also able to survey the nurses on the unit, which was instrumental to form our project direction. One challenge that the team ran into included time limitations. Due to the semester ending in May, the team did not have time to post-survey the nurses on the unit. Additionally, the team was unable to find a unit leader in the microsystem, which would have been helpful in ensuring the information was disseminated and integrated socially on the unit.

**Conclusion**

This project has implications to spread to other inpatient microsystems at the hospital. Once a protocol has been established and the implementation has been completed, other units can adopt the educational handout. The team recommends continuing the project by completing a post-education survey, as well as circulating the handout physically around the unit and catching up nurses that missed the meeting. Furthermore, the unit could pass out badge buddies as a way to have the information at the hands of the nurses at all times. Additionally, the team recommends tracking unit compliance and showing the metric to the leadership teams in order to prioritize the results. Lastly, the team suggests implementing hands-on-training in addition to verbal education as a way for the nurses to learn the information.
References


https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3696963/
### Appendix A

<table>
<thead>
<tr>
<th>Author</th>
<th>Objective</th>
<th>Design</th>
<th>Sample Setting</th>
<th>Results</th>
<th>Conclusion</th>
<th>Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleakly &amp; Cole (2020)</td>
<td>Knowledge and use of clinical guidelines and sepsis screening tools help reduce patient mortality</td>
<td>Three diagnostic steps: blood cultures, measure lactate, measure UO; Three therapeutic steps: give oxygen to keep sats above 94%, give a fluid challenge, give IV abx</td>
<td>This article complies multiple studies in several hospital settings</td>
<td>Delivery of sepsis six within 1 hour of suspected sepsis saves lives (reduced rate of death by 46.6%)</td>
<td>Improved understanding of sepsis among nurses can result in prompt interventions, as they would be equipped to use clinical guidelines effectively.</td>
<td>Level IV - Clinical practice guideline (Dang &amp; Dearholt, 2018)</td>
</tr>
<tr>
<td>Breuer &amp; Hassinger (2020)</td>
<td>To understand how sepsis education impacts provider knowledge, attitude, and behavior</td>
<td>Prospective observational study; utilized newsletters, posters displayed around the hospital, and simulation studies</td>
<td>ED, inpatient, and PICU in a tertiary care children’s hospital</td>
<td>Surveyed nurses and staff reported greater comfort with sepsis recognition and lower hesitancy in responding</td>
<td>Education intervention led to greater knowledge and confidence in nurses, pediatrics residents, and respiratory therapists</td>
<td>Level III – Non-experimental study (Dang &amp; Dearholt, 2018)</td>
</tr>
<tr>
<td>Chua et al. (2022)</td>
<td>To examine nurses’ knowledge and confidence in recognizing and managing patients with sepsis and identify nurse and workplace factors that influence their knowledge on sepsis</td>
<td>Online survey was developed and distributed to nurses in inpatient and ED of three hospitals of a single healthcare cluster. Statistical analysis of closed-ended responses and content analysis of open-ended responses</td>
<td>Multi-site, cross-sectional survey</td>
<td>Total of 709 nurses completed the survey. Nurses possessed moderate levels of knowledge about sepsis and confidence in recognizing and responding to patients with sepsis</td>
<td>A stronger foundation in sepsis education and training programs and the implementation of sepsis screening tools and care bundles are needed to enhance nurses’ knowledge and confidence in recognizing and managing patients with sepsis.</td>
<td>Level III – Cross-sectional (Dang &amp; Dearholt, 2018)</td>
</tr>
<tr>
<td>Damiani et al. (2015)</td>
<td>To perform a systematic review of observational studies evaluating the impact of performance improvement programs on</td>
<td>Data from the studies included studies where extracted independently by two author. Random-effects models were used for the data synthesis</td>
<td>Studies on adult patients with sepsis, severe sepsis or septic shock that evaluate changes in compliance to bundle</td>
<td>Fifty observational studies were selected, performance improvement programs were associated with increased compliance</td>
<td>Performance improvement programs are associated with increased adherence to resuscitation and management sepsis bundles and with reduced mortality in patients with sepsis, severe sepsis, or septic</td>
<td>Level III – Systematic review of non-experimental studies with meta-analysis (Dang &amp; Dearholt, 2018)</td>
</tr>
<tr>
<td>Authors</td>
<td>Objective</td>
<td>Participants</td>
<td>Methods</td>
<td>Findings</td>
<td>Level</td>
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<tr>
<td>Edwards &amp; Jones (2021)</td>
<td>To explore the effects of sepsis training on knowledge, skills, and attitude among nurses</td>
<td>Registered nurses from 16 acute surgical and medical units were invited to complete an anonymous survey. 16 acute surgical and medical units</td>
<td>Nurses with sepsis training had better knowledge of the national early warning score for sepsis screening and the SIRS criteria, had a more positive attitude towards sepsis screening and management and were more confident in screening patients for sepsis.</td>
<td>Sepsis training improves nurses attitudes, knowledge and confidence with regards to sepsis screening and management, resulting in adherence to evidence based care, and should become mandatory for staff.</td>
<td>Level III – Cross-sectional</td>
<td></td>
</tr>
<tr>
<td>Yousefi et al. (2012)</td>
<td>To review the effects of an educational program on knowledge, attitude, and practice of ICU nurses at a hospital in Iran</td>
<td>Quasi-experimental study in which subjects were randomly selected and divided into test and control groups. Scores of knowledge, attitude, and practice of the participants were reviewed through a researcher-made questionnaire before, during and three weeks after a one-day workshop</td>
<td>There were significant increases in mean scores of knowledge, attitude and practice in the test group during and three weeks after the intervention.</td>
<td>Training significantly improved levels of knowledge, attitude, and practice of ICU nurses in sepsis care. Compiling and organizing seminars and continuous basic educational workshops for sepsis care and recommended for healthcare providers</td>
<td>Level II – Quasi-experimental</td>
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</table>
### Appendix B

<table>
<thead>
<tr>
<th>Strength</th>
<th>Weakness</th>
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<tbody>
<tr>
<td>● Majority of nurses feel they are able to explain definition, risk factors, and cause of sepsis (82% rate themselves 4/5 or higher)</td>
<td>● Only 53% of nurses feel they could confidently teach sepsis</td>
</tr>
<tr>
<td>● Inpatient handoff sepsis bundle checklist is already in place on the unit</td>
<td>● Only 5% of nurses felt they had expert level knowledge with the “Inpatient handoff sepsis bundle checklist”</td>
</tr>
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<td></td>
<td>● 35% of nurses feel they have a high confidence level in taking care of septic patients</td>
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</table>

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Threat</th>
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<tbody>
<tr>
<td>● Opportunity to increase confidence and knowledge to through educational material (i.e. handout and videos)</td>
<td>● Possible unwillingness of nurses to participate in the education project</td>
</tr>
<tr>
<td>● Handout will supplement existing sepsis education framework and inpatient handoff sepsis bundle checklist</td>
<td>● Staff turnover and burnout</td>
</tr>
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<td>● Education project is low cost with high potential increase in confidence and knowledge</td>
<td>● Online educational module fatigue</td>
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<td></td>
<td>● Reluctancy to utilize the “Inpatient Handoff Sepsis Bundle Checklist”</td>
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<td></td>
<td>● Nurses not truthfully rating their knowledge and confidence level on the pre/post-survey</td>
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### Appendix C

<table>
<thead>
<tr>
<th>Status</th>
<th>Task/Deliverable</th>
<th>Resp. Party</th>
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<th>Jul</th>
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<td>Microsystem assessment</td>
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<tr>
<td>Survey nursing staff</td>
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<td>CNL &amp; Team</td>
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<td>Analyze survey data &amp; research initiatives</td>
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Stakeholders: Northern California Hospital’s executives, clinical nurse leader (CNL), director of nursing, nurse manager, and the data analysts

CNL & Team: CNL, data analysts/student nurses

Training: Sepsis Handout and Videos

Note: Training will be continued by other student nurses after its initial execution.
Sepsis Definitions

**Sepsis** is a dysregulated host response to infection, most often originating in the lung, urinary, skin, or GI tract \[1\]

**Severe sepsis** occurs when one or more organs are damaged, causing symptoms such as little to no urine output, difficulty breathing, and an abnormal heartbeat \[3\]

**Septic shock** is when blood pressure drops in addition to organ damage \[3\]

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Sepsis Bundle Elements*\[2\]

3-Hour Bundle:
- Complete target fluid bolus (actual or ideal weight based)
- Use NICOM (non-invasive cardiac output monitor) if indicated

6-Hour Bundle:
- Repeat lactate if initial lactate > 1.9
- Check BP/MAP twice 1-hour post fluids
- Provider notified for persistent hypotension (if SBP < 100 or MAP > 65)
- Vasopressor ordered/given (ED/ICU only)

*subject to change in facility protocol

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Risk Factors\[1\]

| 65 | Adults 65 years or older |
| u | People with chronic medical conditions |
| 8 | People with weakened immune systems |
| 5 | People who survived sepsis |
| 1 | People with recent severe illness |
| 2 | Children younger than one year old |

Recognize the symptoms of severe infection and sepsis, TIME is important \[3\]

![Symptoms: T: temperature (higher or lower than normal), I: infection (may have s/s of infection), M: mental decline (confused, sleepy, difficult to rouse), E: extremely ill (severe pain, discomfort, SOB)]

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REFERENCES

2. Kaiser Permanente “Inpatient Handoff Sepsis Bundle Checklist”

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WANT TO LEARN MORE?

Sepsis Alliance has a free course for nurses to learn about sepsis!

2.30 RN CE contact hours, scan the QR Code:
Appendix E

RN SEPSIS SELF-ASSESSMENT SURVEY

Date: ______________________
Department: ______________________

Purpose: This *volunteer/anonymous* RN SEPSIS SELF-ASSESSMENT SURVEY will provide qualitative/quantitative data to capture existing RN SEPSIS KNOWLEDGE and CONFIDENCE in recognizing and managing patients with sepsis.

Instructions: Please answer questions #1 through #5 using the Likert Scale (0 = *do not have any knowledge to 5 = have expert knowledge*). For question #5, please write in your answer.

#1. I can explain Sepsis (definition, risk factors, and cause).

0 1 2 3 4 5

#2. I can recognize the difference between Severe Sepsis and Septic Shock.

0 1 2 3 4 5

#3. I feel comfortable in caring for a Sepsis patient.

0 1 2 3 4 5

#4. I can teach Sepsis.

0 1 2 3 4 5

#5. I am familiar with the “Inpatient Handoff Sepsis Bundle Checklist”.

0 1 2 3 4 5

#5. Case Scenario: Mr. Charles Brown was admitted to your unit at 1200 noon (came from the ED). TZ (Time Zero) was established at 0700 in ED. Initial Lactic Acid result 2.0 at 0800. Currently infusing is IV LR at 125 ml/hr. What are your nursing actions?

________________________________________________________________________

________________________________________________________________________

Thank you for your participation!