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Abstract

Practice Problem: Central Line Associated Bloodstream Infections (CLABSI) are a preventable hospital acquired infection which contributes to patient morbidity, mortality and rising healthcare costs.

PICOT: The PICOT question that guided this project was: In adult inpatients with central venous catheters, does the use of a two-person dressing change team, compared to a single person procedure, decrease the rate of central line associated bloodstream infections over the course of 8 weeks?

Evidence: The prevention of CLABSI is most effective when multifaceted line maintenance bundles are implemented and adherence to these bundles nears 100% (Schreiber et al. 2018).

Intervention: A two-person, evidence-based dressing change procedure was implemented for all central line dressing changes, known as the sterile buddy. The role of this additional bedside nurse was to assist the dressing change through an extra set of hands and to provide real-time sterile technique feedback to the primary nurse.

Outcome: The intervention did not lead to a statistically significant change in the rate of CLABSI, however there was a reduction in the overall number of observed CLABSI compared to both the prior year and the 6 months preceding to the intervention.

Conclusion: The implementation of a sterile buddy was an effective intervention that resulted in a decline in the total of CLABSI, and although not statistically significant, resulted in an estimated cost savings of $56,000 when compared to the year prior and an estimated cost savings of $112,000 when compared to the 6 months preceding the intervention.

Does a Sterile Buddy for Central Line Dressing Changes Reduce the Rate of Central Line-Associated Bloodstream Infections?

Hospital-acquired conditions (HAC) are those that a patient develops while undergoing treatment in the hospital for another disorder and include both hospital acquired infections (HAI) and injuries. These conditions that cause harm to the patient, are classified under patient safety and adverse events, and are considered preventable with the application of current evidence-based practice (Agency for Healthcare Research and Quality, 2019). HAC result in increased cost during a patient's hospital stay, as well as, in future healthcare encounters that may not have been necessary, prior to the onset of the HAC (Kandilov et al., 2014). Central line-associated bloodstream infection (CLABSI) is one of five HAIs which are reported to the Centers for Disease Control and Prevention's National Healthcare Safety Network (Centers for Medicare & Medicaid Services, 2020). Current evidence-based practice supports the use of a CLABSI maintenance bundle with key components that include hand hygiene, cap and tubing changes every 72 hours, chlorhexidine skin antisepsis, and transparent dressing changes every 7 days (Agency for Healthcare Research and Quality, 2018c). Despite implementation of the evidence-based CLABSI maintenance bundle, CLABSI continues to be prevalent within the DNP practice site. The purpose of this project is to address the concern of CLABSI through an evidence-based, quality improvement project that proposes the implementation of a 2-nurse team that consists of a primary nurse and secondary nurse, or sterile buddy, for central line dressing changes.

Significance of the Practice Problem

CLABSIs are a significant burden to not only the healthcare system, but also to patients, as they contribute to thousands of deaths and billions of dollars in added costs to the United States healthcare system (Centers for Disease Control and Prevention, 2011b). When compared

to other HAIs such as, catheter-associated urinary tract infections, ventilator-associated pneumonia, and surgical site infections, CLABSIs are associated with the highest number of preventable deaths and have the highest cost impact (Umscheid et al., 2011). Annually in the United States, there are an estimated 41,000 CLABSI in hospitalized patients with an associated mortality rate of 10%-20% (Centers for Disease Control and Prevention, 2011b). Furthermore, there is an average prolonged hospitalization period of 7 days and an increase in medical costs of $28,000 or more per occurrence (Agency for Healthcare Research and Quality, 2018b). The average annual cost to Centers for Medicare & Medicaid Services (CMS) from CLABSI is $19,246,293.15 (Sankaran et al., 2020). In response to rising healthcare costs, CMS developed the Hospital-Acquired Condition Reduction Program, which penalizes facilities with rates of HACs in the 75th percentile, or worst performing quartile, by 1% each year (Centers for Medicare & Medicaid, 2019). This consequence has led to incentivizing healthcare facilities to make a change in how they prevent CLABSI and other HAIs.

In addition to the challenges that healthcare facilities face with CLABSIs, patients are also affected at the individual level with symptoms consisting of fever, pain, and redness around the insertion site (Centers for Disease Control and Prevention, 2011a). Severe illness due to CLABSI may also occur with patients manifesting signs of sepsis such as hypotension, hemodynamic instability, lethargy, fatigue, and altered mental status, which can be alarming and distressing to the patient and their family members, especially if the clinical course has been complicated and perilous. Treatment of a CLABSI may include additional invasive procedures, testing, and up to 14 days of parenteral antibiotics, which all result in pain or discomfort to the patient (Haddadin et al., 2020).

The majority of CLABSI can be prevented with correct insertion, skin antisepsis, and adherence to evidence-based central line maintenance (Johns Hopkins Medicine, n.d.). The Centers for Disease Control and Prevention provides guidelines and tools for the healthcare community to follow, from the time of insertion through removal, to help decrease the rate of CLABSI (Centers for Disease Control & Prevention, 2011a). In order to improve the quality and safety of patient care, implementation of evidence-based clinical practice guidelines is crucial. However, adherence to clinical practice guidelines across hospitals in the United States varies with implementation rates between 20% and 100%. In addition to increasing awareness, focusing on changing practice patterns at the bedside through multifaceted and multidisciplinary interventions, is the most effective strategy to combat rates of CLABSI (The Joint Commission, 2012).

PICOT Question

In adult inpatients with central venous catheters, does the use of a two-person dressing change team, compared to a single person procedure, decrease the rate of central line associated bloodstream infections over the course of 8 weeks? The population consisted of adult inpatients with central venous catheters who were hospitalized in the cardiovascular intensive care unit (CVICU), either prior to or following cardiothoracic or vascular surgical procedures, or following acute cardiovascular decompensation requiring continuous respiratory and/or circulatory support. The patients were adults, greater than 18 years of age, and had a number of diagnoses including heart failure, coronary artery disease, peripheral artery disease, myocardial infarction, cardiogenic shock, valvular dysfunction, and cardiac arrest.

The intervention, as described by Wilder et al. (2016), utilized two nurses to perform the routine central line dressing change with the primary nurse performing the dressing change and

the second nurse, or sterile buddy, assisting and functioning as a sterility monitor by stabilizing the catheter, completing a central line bundle checklist, and providing feedback. The usual care for a central line dressing change was for the primary nurse to perform the dressing change independently every Wednesday, or when soiled. Through implementing this method, yet maintaining the set day and time of dressing changes already established, Wilder et al. (2016) reported a 92% improvement in the rate of CLABSI, from 3.9 per 1000 line days to 0.3 per 1000 line days. The primary expected outcomes of this project were a diminution in the total number of CLABSI, calculated by adding up the total number of CLABSI during the implementation period, and rate of CLABSI as defined by the number of CLABSI divided by the number of central line days, multiplied by 1000 (Centers for Disease Control and Prevention, 2020). The raw number total of CLABSI differs from the CLABSI rate because it includes all CLABSI for the unit, including the extracorporeal life support and ventricular assisted device patients, who are excluded from the report to the National Healthcare Safety Network (Centers for Disease Control and Prevention, 2021). The implementation took place over a period of 8 weeks and comparisons were made to the same 8 weeks in the year prior to the implementation, as well as, the 4 months leading up to the implementation. Due to the substantial increase in CLABSI in the CVICU, there was significant buy-in from stakeholders and a sense of urgency for the completion of this project.

Evidence-Based Practice Framework & Change Theory

The ideal evidence-based practice (EBP) model is the Johns Hopkins EBP (JHEBP) model which consists of three interrelated components: inquiry, practice, and learning (Dang & Dearholt, 2017). Inquiry is the first step and includes members of the nursing staff and healthcare team, questioning whether the best evidence and practice is being used for the management or

prevention of a specific problem. Next is practice and involves three steps: practice question, evidence, and translation (PET). The PET process is a systematic approach that involves solving the practice question, finding the best evidence, and translating that evidence into practice, and is a continuous process that leads to the third component, learning. The cycle of practice and learning continues and can lead to a new EBP process that starts over with inquiry or can progress forward into best practice application and practice improvements.

In the first step, nursing staff were verbalizing frustration with the difficulty of central line dressing changes and the increase in observed CLABSI for their unit. The next step starts the PET process. First is considering what aspect of the dressing change may be correlated to rising CLABSI rates in the institution, and what evidence must be gathered in order to find a solution to the problem. Second is finding the best evidence and conducting a thorough review of the literature. The third step involves translating and creating a change in practice that results in improved patient outcomes through planning, implementing, and evaluating the practice change. Throughout the PET process, there may often be new information, thoughts, and ideas that lead to more questions, yielding the start of the JHEBP model. This aspect of the model is learning, which is the informal process of adopting knowledge by applying it in practice and creating a behavioral change and thus influencing practice (Dang & Dearholt, 2017). The end result is the identification and creation of best practices which leads to quality improvements.

The change theory that best fits the project is described by John Kotter and involves eight steps (Kotter, n.d.). First, create a sense of urgency by addressing a problem that is a part of the current culture and has led to adverse patient outcomes (Small et al., 2016). Second, the formation of a diverse team that has the ability and the willingness to create and support change. Third is creating a strategic vision which motivates people to take action (Kotter, n.d.). Fourth is

communicating the vision through education. The fifth step is to empower others to act on the strategic vision and promote buy-in on the unit and organizational level (Small et al., 2016). Sixth is to create small wins so that members of the team can see their progress or positive change from the intervention. Seventh is to build on the change in order make it more streamlined and to increase its practicality for nursing staff to complete, which increases adherence and the potential for change. The eighth step is to institutionalize the change by making it the new norm and promoting nursing education to promote sustainability.

Utilizing Kotter as the change theory for this project is the best fit because of the nature of the problem. CLABSIs are preventable conditions that occur from the breakdown in the central line bundle. Creating a sense of urgency to address CLABSI is crucial, especially as rates are rising and the policy at the DNP practice site already includes the implementation of the central line bundle for insertion and maintenance. The success of this project needed the willingness of key stakeholders to drive the change, and the creation of a great team, or guiding coalition. Kotter (n.d.) states the buy-in from the stakeholders and the team is the linchpin of the entire model as it allows for accountability and diversity and involves team members that are committed to the change initiative. The intervention to address CLABSI in the DNP practice site asked nursing staff to devote more time and effort to their current practice.

Evidence Search Strategy

In order to identify potential solutions to climbing CLABSI rates, a literature search was performed that focused on evidence-based prevention strategies. There are many evidence-based interventions in the literature including the creation of central line dressing maintenance kits, implementation of daily maintenance bundles, promotion of skin antisepsis, creating checklists, and utilizing central line alternatives such as midline catheters or ultrasound guided peripheral

IV lines. However, when discussing central line maintenance with the nursing staff, it was revealed that the central line dressing changes performed according to hospital policy and the dressing manufacturer's recommendation can be difficult to accomplish independently while still maintaining sterility. There is also considerable variability in how the nursing staff perform each dressing change in order to circumvent this difficulty.

A search of the literature was performed in three databases including CINAHL Complete, PubMed, and Google Scholar. The keywords for the search included "central line associated bloodstream infections or CLABSI", "prevention", "maintenance", "team or two person or 2 person". Additional criteria included limiting text to the English language, scholarly and peer reviewed journals and evidence published after 2015. The one initial exclusionary criterion was "hemodialysis", primarily because these patients leave the hospital with their line in place and CLABSI prevention in this population would require a different scope of interventions when compared to the hospitalized inpatient. Initially abstracts were reviewed for relevancy. For those abstracts which were unclear or appeared relevant, the full text articles were obtained and reviewed. Articles included in the evaluation were those that discussed the two-person dressing change performed by nursing staff for central line maintenance in an effort to decrease rates of CLABSI.

Evidence Search Results

As demonstrated by Moher et al. (2009) in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) flow diagram (Figure 1), the above database search yielded 1329 articles with three additional articles obtained during the review of each individual full text articles. After duplicates were removed, there were 1245 articles in which the abstracts were screened for relevancy and those that did not pertain to central line maintenance bundles or

include a component of two person or team dressing changes were excluded. This resulted in 20 full text articles which were then reviewed for eligibility. Two additional articles were removed because once the full texts were obtained it was found that the abstracts belonged to conference presentations and not full peer-reviewed articles. This led to 18 full text articles which were read critically with 11 additional articles excluded primarily for the method or lack of detail behind the intervention. For example, there was one article that utilized a team of respiratory therapists instead of registered nurses and was thus excluded. This led to seven critically appraised and summarized articles, four primary research articles, and three systematic reviews which are described in Appendices A and B, respectively.

Utilizing the Johns Hopkins Nursing Evidence-Based Practice Model, the quality of the articles were A, or high, (n = 1) and B, or good, (n = 3), the evidence was appraised for level and quality (Dang & Dearholt, 2017). The primary research articles were level III (n = 1) and V (n = 3), which is presented in Appendix A. This level was primarily due to the fact that the articles were quality improvement projects or non-experimental in nature. The primary reason for the majority of the articles being considered as good quality was that the interventions were not conducted across multiple settings and focused primarily on one unit with a specific patient population. The results were consistent with the recommendations provided and there were clear aims and objectives for each project with a thorough review of the current scientific evidence included. In addition to the primary research articles, there were three systematic reviews and meta-analyses. Two of the three of these articles were level III with one being a level II but all were high quality, A. The primary rationale behind the evidence level of III was the lack of randomized controlled trials and inclusion of non-experimental quality improvement projects.

All three articles included meta-analyses and provided consistent and generalizable results that are based on a comprehensive literature review, which is presented in Appendix B.

Themes with Practice Recommendations

The literature presented in Appendix A summarizes primary research articles that discuss the utilization of a two-person team to conduct central line dressing changes. The literature presented in Appendix B summarizes the systematic reviews and meta-analyses that discuss the utilization of bundles for central line maintenance to prevent CLABSI. There were several key themes that emerged from the literature review including adherence to central line maintenance bundles to reduce the rate of CLABSI, presence of three key categories that must be utilized in the bundle for effectiveness, and implementation of a central line maintenance bundle to reduce healthcare costs.

Central Line Maintenance Bundles to Reduce CLABSI

In an effort to decrease the rate of CLABSI, the implementation of multifaceted central line maintenance bundle and increased rates of adherence, resulted in risk reduction (Ista et al., 2016; Payne et al., 2018; Schreiber et al., 2018). Schreiber et al. (2018) reviewed literature for all reportable hospital acquired conditions and found that multifaceted bundles were most effective in the reduction of CLABSI rates. Ormsby et al. (2018) demonstrated that an enhanced central line maintenance bundle, and implementation of a two-person dressing change, was more effective at reducing CLABSI rates when compared to the basic maintenance bundle as described the by the Centers for Disease Control and Prevention. Ormsby et al. (2018) implementation led to an 85% reduction over a 12-month period of CLABSI. Dandoy et al. (2015) added that improved system stress on the nursing staff by providing a second person for the central line dressing change, resulted in increased bundle compliance to 100%, daily hand

hygiene improved to 75%, and CLABSI rates decreased to 0.39 per 1000-line days compared to 2.03 prior to the intervention.

Presence of Key Bundle Categories

Schreiber et al. (2018) and Ista et al. (2016) in systematic reviews found that bundle components vary across the literature, but there were three main categories present in each successful bundle. First was the use of education, where the nursing staff was educated on each aspect of the bundle and how to perform each portion correctly. Second was the use of audit and feedback where nursing staff were observed by peers and/or administration, feedback was provided on compliance, and changes in performance were made when indicated. Third was the utilization of daily checklists to remind nurses to utilize and document bundle adherence. Buchanan et al. (2019) utilized a "compliance" coach which observed nursing staff during all components of the central line maintenance bundle and found that over time, the audit and feedback improved compliance and identified that staff preferred real-time educational feedback outside the patient's room. Ormsby et al. (2018) utilized the second person in the dressing change team to provide feedback and assistance with the dressing change technique and daily line maintenance, improving adherence to greater than 90%. Wilder et al. (2016) utilized a central line rounding team which functioned in the audit and feedback role while the two-person dressing team performed the procedure and daily line checklist together, leading to a 92% reduction in CLABSI rates over three years and a decreased length of stay by 17.6 days.

Improved CLABSI Rates Decreases Costs

One of the themes that was present in the majority of the literature was the cost savings to the healthcare facility with a reduction in CLABSI through bundle implementation and adherence. Wilder et al. (2016) reported cost savings in terms of preventable infections with a

reported savings of $327,238.34. While Ista et al. (2016) in a systematic review reported a median cost savings of $42,609 following bundle implementation.

Caveat

One caveat to report is that the majority of the research was conducted in the pediatric inpatient setting, however, the utilization of a two-person dressing change team was not specific to the pediatric population and did not contain pediatric specific care. For example, the utilization of the second nurse was not to provide moral support or hold a child in place while the primary nurse performed the dressing change. The literature supported the use of an additional nurse to function as a sterility monitor and an extra set of hands to assist with removal of the original dressing (Ormsby et al., 2018; Wilder et al., 2016). Ista et al., (2016) demonstrated that care bundle implementation in the maintenance of central lines was associated with a decline in CLABSI rates, regardless of the age of the population.

Summary

The extensive literature review performed identified key themes. Of primary importance is that the use of central line maintenance bundles as described by the Agency for Healthcare Research and Quality are prevalent throughout the literature and adherence to central line maintenance bundles decreases the rate of CLABSI (Agency for Healthcare Research and Quality, 2018b; Ista et al., 2016; Payne et al., 2018; Schreiber et al., 2018). Facilities that observed rising or persistent rates of CLABSI, enhanced central line maintenance bundles using a two-person dressing change to provide real-time audit and feedback, physical assistance with the procedure has shown to improve rates of CLABSI and promote nursing adherence to the maintenance bundle (Dandoy et al., 2015; Ormsby et al., 2018; Wilder et al., 2016). The strength of this recommendation with the utilization of the JHEBP model, is level III due to the

abundance of quality improvement projects reviewed and systematic reviews that contained high quality improvement projects; and due to the extensive application in a number of populations, settings, and breadth of background research included (Dang & Dearholt, 2017).

Setting, Stakeholders, and Systems Change

The implementation of a secondary nurse, or sterile buddy, for central line dressing changes was performed in the CVICU in a large academic medical center. The patients on the unit are primarily postoperative cardiovascular or cardiothoracic patients, who are recovering from procedures such as heart transplant, coronary artery bypass grafts, heart valve replacement, aortic aneurysm repair, and pulmonary embolism. In addition, some patients were recovering from a critical illness where they were hospitalized in the ICU following cardiac arrest, implantation of heart-assistance devices or temporary total artificial heart or other cardiovascular decompensation. These patients had multiple lines in place including central venous catheters, arterial lines, extracorporeal membrane oxygenation lines, and aortic balloon pumps that were crucial to survival. A CLABSI, in this population, has the potential to increase the following: hemodynamic instability, risk of decompensation, risk of mortality, length of stay in the hospital, and healthcare costs. These risks and concerns for patients and healthcare facilities create an urgency for interventions.

The need to address the rate of CLABSI in the organization was brought forth by the quality and safety team members who report rising rates across the organization. The rising rates were initially attributed to supply chain disturbance and extension of IV tubing changes from every 96 hours to every 7 days, with the management of the novel Coronavirus infection. However, as the supply chain returned to baseline and the tubing changes returned to the recommended every 96 hours, the rates of CLABSI failed to return to rates consistent with the

previous fiscal year, resulting in an opportunity for change in current practices. Key stakeholders identified included the nursing staff, patient care managers, CLABSI task force, quality and safety team, infection prevention and control, as well as, patients and their family.

The patient care manager for the CVICU was concerned about persistent CLABSI, and provided education to staff and encouraged staff to perform daily line checklists to address the unit's high CLABSI rates. Additionally, the CLABSI task force pursued opportunities and ideas for process change, to reduce rates of infection with updated evidence-based interventions that would promote the necessary change for improved CLABSI rates. In this project, sustainability was shown through the use of a sterile buddy, as this provided support for the organization's staffing model to effectively follow policy and strengthen compliance surrounding central line dressing changes. The CVICU nurses already conduct a daily central line checklist, and the primary nurse simply relies on an additional nurse to complete a certain aspect of the daily care routine, which is common in nursing practice, particularly in the ICU. The importance of interprofessional collaboration between the nurses and the patient care managers, regarding matters such as bedside procedures, quality and safety, and infection prevention and control is vital for ongoing education and compliance.

When conducting the SWOT analysis, shown in Figure 2, the primary strength was the current desire of the nursing staff and patient care manager to create change in the unit's CLABSI rates. The primary weakness, which was used as a strength, was the number of new nurses that came off orientation on this unit in the months immediately preceding and during the intervention implementation. The risk of the newer nurses becoming overwhelmed with functioning independently and missing crucial aspects of the central line bundle was circumvented by the opportunity to provide education and create a culture based on the goal of

zero HAC, including CLABSI. The goal of this project was to create a system change at the micro and meso level. At the micro level, the day-to-day practice will change as the nursing staff utilize sterile buddies for the maintenance of their central lines, and potentially other sterile procedures, in order to prevent hospital acquired conditions. At the meso level, there would be a change in the unit, service line, and organizational policy to promote the use of the sterile buddy across the organization as a method to prevent HAC.

Implementation Plan with Timeline and Budget

There were three main objectives for this project. First was a reduction in the rate of CLABSI over an 8 week period. Prior to implementation, the unit had a CLABSI two to four times per month. With the implementation of this project there was the ability to determine quickly if there was an impact on CLABSI. The second objective for this project was the utilization of the organizationally developed “WILDCARD”, or central line checklist. The WILDCARD is the AHRQ CLABSI toolkit component, the Central Line Maintenance Audit Form, was re-formatted and developed based on the experiences of more than 1,800 ICUs and through the partnership of Health Research and Educational Trust, Armstrong Institute, and the Michigan Hospital Association (Agency for Healthcare Research and Quality, 2018a). At baseline, the unit completed the WILDCARD checklist, intermittently. However, one of the objectives of this project was to complete the WILDCARD checklist daily so the remaining aspects of the central line bundle, outside of the weekly dressing change, were completed. The nursing staff were asked to add the central line maintenance review to their bedside report at shift change, completing the WILDCARD checklist every 24 hours. Permission to utilize the WILDCARD checklist data was obtained from the organization and is listed in Appendix E. The third objective of this project was to have every central line dressing change completed with a

sterile buddy over the course of the 8 week implementation period. The goal of this project was to enforce adherence to the central line maintenance bundle including assessing catheter needs daily; changing clear dressings every 7 days after disinfecting the site with chlorhexidine; replacing administration sets every 72 hours or every 24 hours if used for blood, blood products, or lipids; changing caps no more than every 72 hours; disinfecting catheter hubs, connectors, and injection ports; and daily chlorhexidine bathing (The Joint Commission, 2012).

The timeline for this project from planning through implementation and evaluation is included in Appendix C and was formatted to reflect the concepts described above for the Kotter Change Model. The site of this project is the CVICU, however the literature supports the implementation in any intensive care unit. The implementation of this project was adapted from Wilder et al. (2016) and utilizes a sterile buddy to complete central line dressing changes. Prior to implementation, the project manager verified the institutional policy regarding central line dressing change and central line maintenance bundle components that were already in place. According to hospital policy, central line dressing changes are to be performed within 12 hours of admission from an outside facility, every Wednesday regardless of when the dressing was last changed, when the dressing was breached to air, loose, damp, soiled, bloody, or oozing beyond the area of the chlorhexidine square, or if anything had saturated or colored the edges of the dressing. The majority of the dressing changes were completed utilizing two designated deep line dressing nurses who rounded on the unit and performed the required dressing changes on Wednesdays. If a dressing change was indicated outside of the weekly dressing change, the primary nurse utilized another nurse on the unit as their sterile buddy to complete the procedure, as described in Appendix F. In addition to the use of the sterile buddy intervention, signage was created for the unit, shown in Appendix G, and placed in common areas to serve as a reminder

for the nursing staff to perform the CLABSI WILDCARD checklist, included in Appendix D. Education was conducted utilizing a SurveyMonkey link which included a 3-minute educational video and 3 true/false questions, in addition, a final question in the survey provided an open text box for questions and comments. The link for the educational survey was rolled out 2 weeks prior to implementation. Every Wednesday emails were sent to remind staff of the intervention and to provide the link for the education and survey. Weekly rounds were made on day and night shifts to provide just-in-time educational refreshers and query nursing staff for any problems that may have been encountered when carrying out the intervention. Data was collected using the WILDCARD checklist at the end of each week with nursing staff documenting the dressing change and the use of a sterile buddy in the comment section.

The first role of the project manager was to create a budget for the implementation of the project, included in Table 1. The primary cost for the implementation of this project was the cost to perform the educational sessions during the implementation phase, which was performed by the project manager. Given that there are 170 nurses, the project manager created a brief informational video for the staff to watch and answer 3 true/false questions, which required about 5 minutes of time by the nursing staff. There was an additional 55 minutes allotted in the budget for bedside education with individual nurses regarding project implementation, providing responses to questions or concerns throughout the eight-week implementation period, as well as, reading the weekly project update emails. In addition, the project manager reviewed the adherence and progress of the intervention each week, addressed concerns by the staff during the implementation period, and provided updates throughout the implementation to empower nursing staff in an effort to continue to promote the reduction of CLABSI rates. The project

manager functioned as a member of the interprofessional team, to support the nurses and other healthcare members in creating a positive change on the unit.

Results

All of the measures were collected utilizing a medical record review and WILDCARD data. The data was collected by the healthcare quality and safety team within the organization, and provided to the project manager as de-identified raw numbers. The data provided was raw numbers of total CLABSI, total central line days and calculated rate of CLABSI. The primary outcome measure was the rate of CLABSI which is defined as the rate of CLABSI per 1000 patient days. The remaining measures with their associated statistical tests are included in Appendix H. The data discussed in Appendix I was collected weekly and the number of CLABSI and daily central line checklist completion was calculated on a continuous manner by the clinical nurse specialist and stored in a HIPAA compliant manner according to the facility's policy.

Analysis was completed by the project manager, using Intellectus Statistics software through permission provided by the University of St. Augustine for Health Sciences. Data was collected for 8 weeks during the implementation period and compared to the last quarter of 2020 through the start of the intervention and the same 8 weeks in the year prior to the intervention. The data collection tool used is presented in Appendix I.

CLABSI Rate Reduction

The rate of CLABSI during the implementation period was 0. As a result, a two-tailed one sample *t*-test was performed to examine whether the null hypothesis could be rejected, and that the CLABSI rate of 0 during implementation was a result of the intervention and not based on chance. A p-value of 0.05 determined statistical significance. When comparing the same 8 weeks in 2020 to the implementation period, a Shapiro-Wilk test was conducted to determine

whether the 2020 data could have been produced by a normal distribution (Razali & Wah, 2011). The results of the Shapiro-Wilk test were significant based on an alpha value of 0.05, W = 0.75, p < .001, indicating that the normality assumption was violated. When the Shapiro-Wilk test was completed for the time period from October 2020 to the start of the intervention, the results were not significant based on an alpha value of 0.05, W = 0.86, p = .271. The results of the Shapiro-Wilk test means that the likelihood that the rates were produced by a normal distribution could not be ruled out, thus the normality assumption was met. The results of the two-tailed sample *t*-test are presented in Table 1. Based on the p-values for both comparison periods the null hypothesis cannot be rejected.

Table 1

CLABSI Rate Comparison

Variable	*M*	*SD*	μ	*t*	*p*	*d*
February to April 2020	0.67	0.58	0	2.00	.184	1.15
October 2020 to February 2021	1.12	1.43	0	1.56	.216	0.78

Note. Degrees of Freedom for the *t*-statistic = 2. *d* represents Cohen's *d*.

While the rate comparison was not found to be statistically significant, the Cohen's *d* was 1.15 for the same months in the prior year. This demonstrated that the intervention had a large effect on the rate of CLABSI even if it was not significant. The Cohen's *d* for October to the start of the intervention time period was 0.78 which demonstrated the intervention had a medium effect on the rate of CLABSI.

Additional Measures

The main process measure was the rate of completion through the addition of a sterile buddy for central line dressing changes, as defined by the number of dressing changes documented in the WILDCARD being performed with or without a sterile buddy, divided by the number of times two people were used, times 100. The goal protocol adherence rate was 80% for

the utilization of a sterile buddy in the documentation of the daily central line review. The average adherence rate for the intervention, or percent completion of central line dressing changes with a sterile buddy, was 83.6%.

If we assume that the average increase in cost per CLABSI was $28,000 based on data from the Agency for Healthcare Research and Quality (2018b). The estimated cost savings when compared to the same time frame in the prior year was $56,000 and $112,000 for the time period from October 2020 until the start of the intervention.

Clinical Significance

Ultimately, the goal for evidence-based practice is to create clinical significance, which results in meaningful change in the lives of patients in such a way that it should direct how patients are cared for. Clinical significance takes statistical significance one step further and looks at patient outcomes combined with subjective clinical judgment to determine if the intervention is beneficial and should be incorporated into everyday practice. An example of clinical significance would be the protocolization of central line dressing changes, to create a streamlined procedure that all nurses on the unit are able to complete, not just the designated central line dressing change nurses. This streamlined process, combined with the importance of improving nursing teamwork by encouraging nurses to participate in daily evidence-based practice and to rely on each other to facilitate change and maintain a zero-harm environment for patients.

Impact

Implementation of this project addressed the rate of CLABSI by utilizing a two-person team to perform central line dressing changes. The CVICU primarily carried out the intervention with two scheduled deep line dressing nurses. Additional central line dressing changes were

performed with either a primary nurse and partner or a designated deep line dressing nurse and the patient's primary nurse. Nurses who functioned in this role reported that having another person in the room with them during a central line dressing change improved their technique simply by having the person in the room to assist and maintain proper technique. Staff also reported that the sterile buddy was able to notify the primary dressing change nurse that the sterile field had been breached and provide an extra set of hands to position the patient and promote adherence of the dressing to the patient's skin.

In order to continue to improve on the practice problem, there should be additional review of the data and the impact that the intervention had on the rate of CLABSI in the CVICU. Prior to and during the implementation there was concern from the nursing staff that their current staffing levels did not support a two-person dressing change. Additionally, there were opinions that felt the use of two nurses for a commonly performed nursing procedure was not a good utilization of the available staff. In order to promote sustainability of this intervention over time, there needs to be more conversations with the nursing staff regarding the importance of CLABSI reduction on the unit and the role that the nurse plays in CLABSI prevention. Additionally, a secondary study could be completed which measures the amount of time spent on the two-person dressing change, compared to the single person dressing change to clearly illustrate the time requirements for each nursing team member. Illustrating the time difference may encourage continued participation and improve the longevity of the intervention.

Dissemination Plan

PowerPoint presentation during the weekly CLABSI meeting held by the quality and safety department, with the goal of creating a new policy to support the importance of the use of a sterile buddy for all central line dressing changes. The next step for dissemination was to

present the project and results at the organization's nursing research day, which was in the form of a poster presentation. Key invitees included the primary stakeholders for this project, the director of cardiovascular nursing services, chief nursing officer, infection prevention manager, enterprise nursing operations director, and physician and advanced practice provider staff for the CVICU.

The primary journal for dissemination of the results from this evidence-based project will be the journal *Critical Care Nurse* published by the American Association of Critical-Care Nurses with a focus on clinical, relevant information regarding the care of critically and acutely ill patients. This journal is a great fit for dissemination of the results of this project because it is focused on tools that bedside nurses use daily to provide care for patients in the ICU. The first level of peer review will come from the preceptor for this project who is knowledgeable about the organization, cardiovascular intensive care, and understands the primary objectives of the project. Following each presentation described above there will also be opportunities to provide feedback, which will be used to tailor the final manuscript that will be submitted to the selected journal and regional meeting. The final step in the dissemination process will be submitting the completed project into the SOAR@USA repository. This step takes place after final approval of the manuscript is received from the University of St. Augustine faculty and includes uploading the manuscript and assigning keywords and subject categories to facilitate the search of the manuscript in the future.

Conclusion

Addressing rates of CLABSI is multidimensional and requires a team approach. The use of daily central line maintenance bundles has been demonstrated to decrease the rate of CLABSI (Agency for Healthcare Research and Quality, 2018b; Ista et al., 2016; Payne et al., 2018;

Schreiber et al., 2018). However, a facility that utilizes the central line maintenance bundle and still sees a risk or persistent rates of CLABSI, the application of an enhanced central line maintenance bundle, such as the use of a sterile buddy, has been demonstrated to promote adherence and decrease rates of CLABSI (Dandoy et al., 2015; Ormsby et al., 2018; Wilder et al., 2016). The above evidence-based practice project details the implementation of a two-person dressing change described by Wilder et al. (2016) with the completion of a daily maintenance bundle checklist as described by the Agency for Healthcare Research and Quality (2018c) in order to reduce the rates of CLABSI in the CVICU of a large academic medical center. While there was not a statistically significant change in the number of CLABSI during the implementation period, there was a decline in the rate of CLABSI. This decline resulted in an estimated cost savings of $56,000 when compared to the same time period in 2020 and a cost savings of $112,000 when compared to the 6 months prior to implementation.

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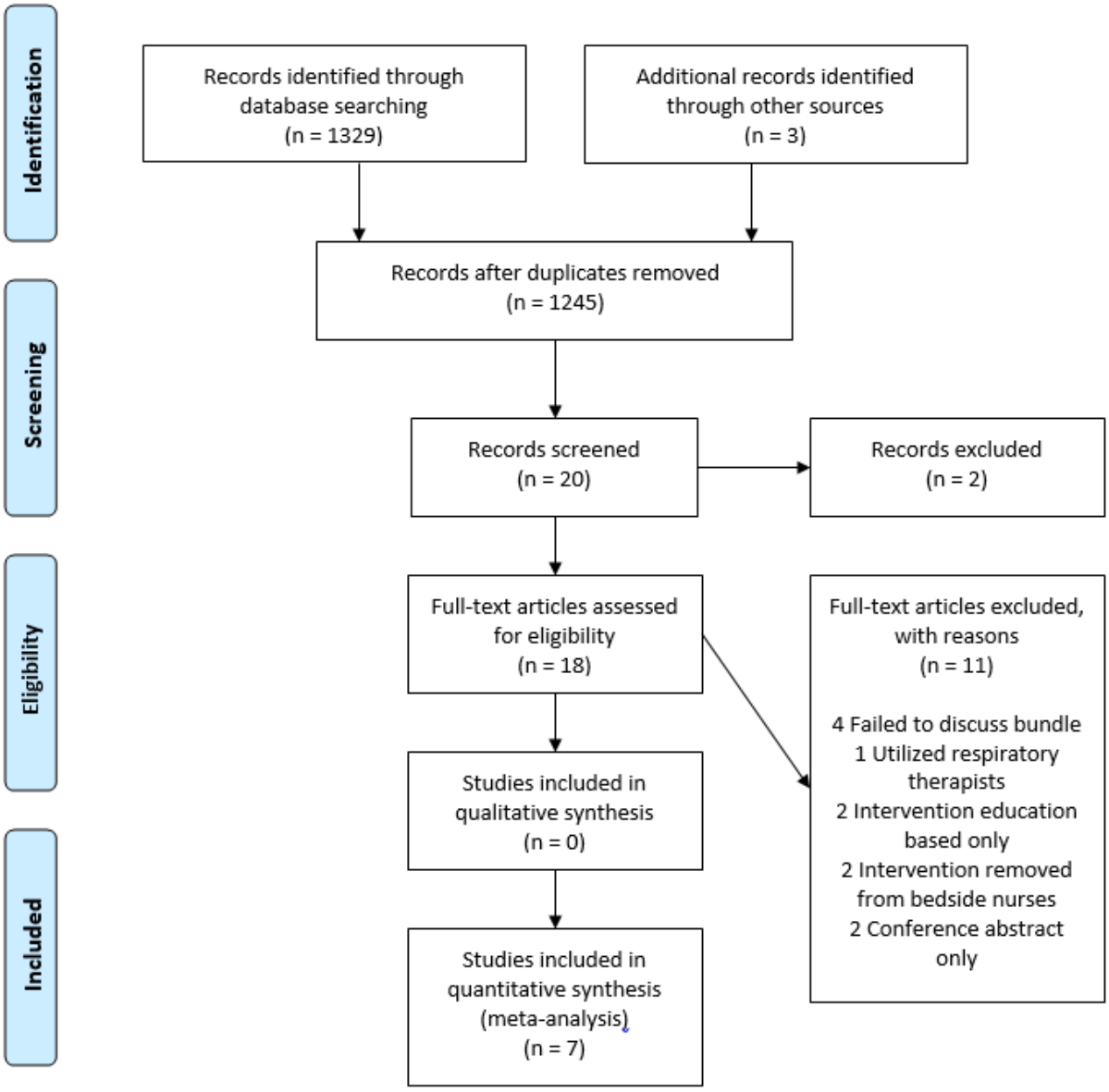
Figure 1

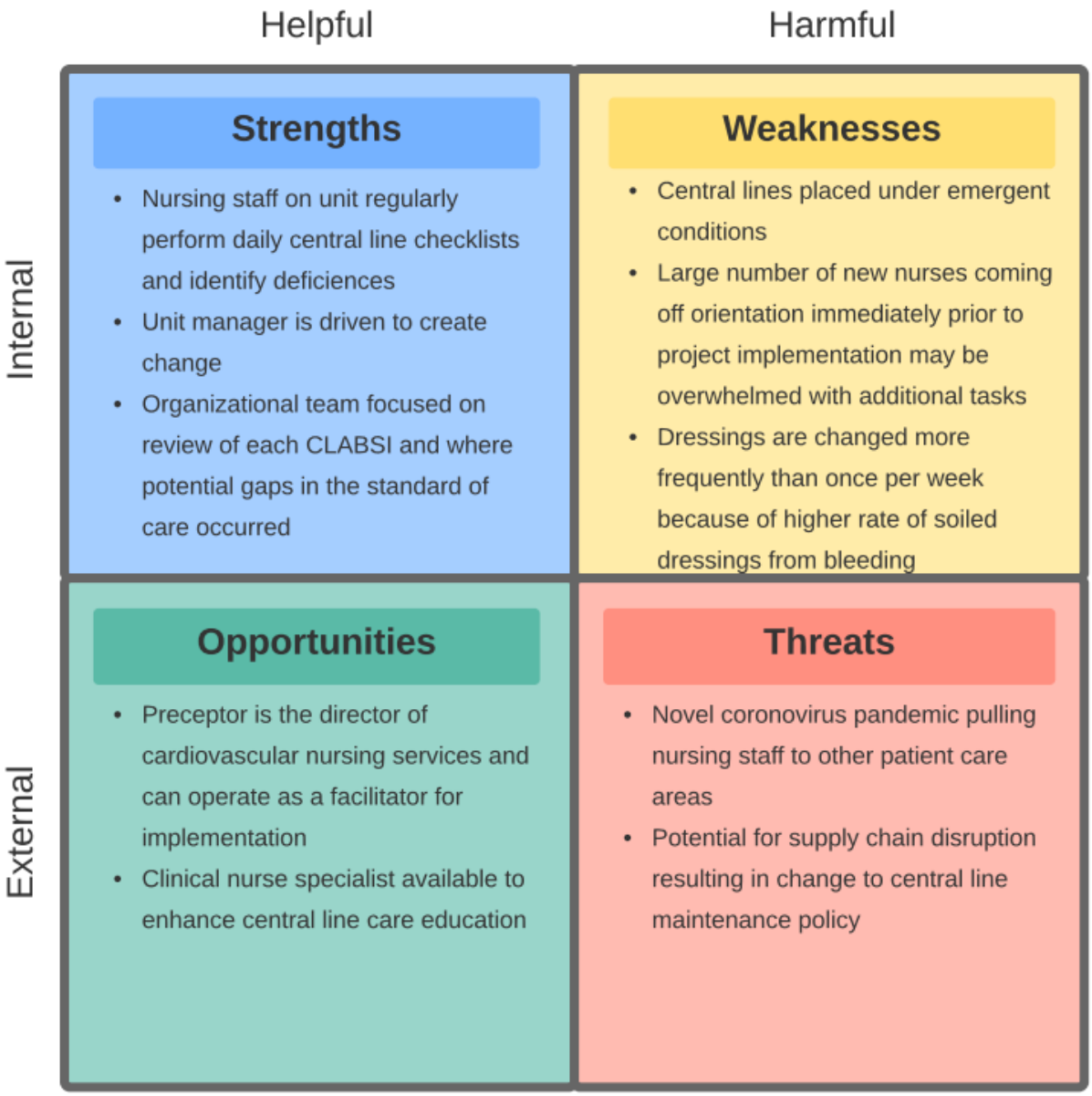
PRISMA Flow Diagram



Note: Adapted from "Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement" by Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., The PRISMA Group. (2009, July 21). *PLoS Medicine*, *6*(7), e1000097. https://doi.org/10.1371/journal.pmed.1000097.

Figure 2

SWOT Analysis



Appendix A

Summary of Primary Research Evidence

Citation	Design, Level Quality Grade	Sample Sample size	Intervention Comparison (Definitions should include any specific research tools used along with reliability & validity)	Theoretical Foundation	Outcome Definition	Usefulness Results Key Findings
Wilder, K. A., Wall, B., Haggard, D. & Epperson, T. (2016). CLABSI reduction strategy: A systematic central line quality improvement initiative integrating line-rounding principles and a team approach. *Clinical Issues in Neonatal Care, 16*(3), 170 – 177. doi:10.1097/ANC.0000000000000259	Quality Improvement Level V, B	Neonatal ICU	Intervention: 3-person line-rounding team and 2-person dressing change team which observed all the central lines daily and completed a line rounding audit tool as well as perform all dressing changes Comparison: usual care prior to implementation	None	CLABSI rate reduction, defined as number of CLBASI per 1000 line days Preventable CLABSI infections: CLABSI rate x central line days x mortality rate Total cost of care: preventable infections x excess hospital days	Use of a two-person dressing change team to assist with holding the line in place while the dressing is removed and replaced Improved CLABSI rate also leads to calculable cost of care savings 92% reduction in CLABSI over

					x cost per CLABSI infection	3 years, equaled a decrease of 7 Decreased length of stay by 17.6 days Saved hospital $327,238.24 dollars
Buchanan, M. O., Summerlin-Long, S. K., DiBase, L. M., Sickbert-Bennett, E. E. & Weber, D. J. (2019). The compliance coach: A bedside observer, auditor, and educator as part of an infection prevention department's team approach for improving central line care and reducing central line-associated bloodstream infection risk. *American Journal of Infection Control*, *47*(1), 109 – 111. https://doi.org/10.1016/j.ajic.2018.06.005	Non-experimental Level III, B	31 inpatient units in a 933-bed academic medical center 5 ICU, 3 stepdown and 23 acute care units	Intervention: registered nurse embedded in the department as a compliance coach conducting routine and unannounced audits of central venous access devices and IV tubing, roles included observation, data capture, coaching, reporting and focused education Comparison: none	None	Improved compliance overtime for key observations including: dressing is clean, dry and intact; dressing is dated and initialed; chlorhexidine sponge is correctly placed; IV tubing label is present; label is dated and initialed. Survey of bedside nurse and nurse managers to	Nursing survey after intervention was complete provides insight into where feedback is preferred, with half preferring feedback outside the room.

					evaluate compliance of coach's role, desired frequency of audits	
Ormsby, J. A., Bukoye, B., Lajoe, D.,Shermont, H., Martin, L., Leger, K.,… & Lee, G. M. (2018, November). Enhanced central venous catheter bundle for pediatric parenteral-dependent intestinal failure. *American Journal of Infection Control, 46*(11), 1284 – 1289. https://doi.org/10.1016/j.ajic.2018.04.209	Quality improvement Level V, B	Parenteral dependent pediatric patients, implementation units were 2 inpatient surgical units 2292 encounters with 1212 unique patients during the intervention, 1679 encounters with 900 unique patients pre-implementation and 613 encounters with 409 unique patients post-implementation	Intervention: enhanced bundle implementation with 2 nurses required for all CVC related care, chlorhexidine patch for all dressings, ethanol locks, daily bath with disposable rinse-free cloth, creating a distraction free zone for CVC care, bundle lab tests, collect labs via peripheral stick if possible, change all parenteral nutrition tubing every 24 hours Comparison: pre-intervention, January 2013 to December 2015	Plan-Do-Study-Act method	CLABSI rate as defined by CDC's National Healthcare Safety Network, defined as number of CLBASI per 1000 line days	Utilization of an enhanced bundle for CVC with the addition of 2 nurses for all CVC care to the basic bundle as described by the CDC results in a decrease in CLABSI rate. Adherence to the enhanced bundle was >90%. Nurses even reported the extra set of hands helped them complete the procedure with the highest level of aseptic or sterile technique

						85% reduction in CLABSI over 12 months 1.41 to 0.40/1000 line days, p value 0.003 Applies because it focused on patients receiving parenteral nutrition which significantly increases the risk for CLABSI
Dandoy, C. E., Hausfeld, J., Flesch, L., Hawkins, D., Demmell, K., Best, D.. … & Simmons, J. (2015, November 25). Rapid cycle development of a multifactorial intervention achieved sustained reductions in central line associated bloodstream infections in haematology oncology units at a children's hospital: A time series analysis. *BMJ Quality & Safety, 25*¸633 – 643. doi:10.1136/bmjqs-2015-004450.	Quality improvement Level V, A	Pediatric hematology-oncology and bone marrow transplant unit	Intervention: standard process for daily hygiene, identification process for high risk patients, increased/improved education for nurses, two-person CVC dressing change, safety coaches, increased CLABSI prevention rounding and improved	Plan-Do-Study-Act method	CLABSI rate, defined as number of CLBASI per 1000 line days	Reduced CLABSI rate from 2.03 to 0.39 CLABSI/1000 line days (p value 0.008) 100% adherence to new standard of two-person dressing change, improved daily hygiene to 75%

			environmental services Started in May 2014 with rapid cycle plan-do-study-act repeated every 2-3 weeks Comparison: pre-intervention June 2013 to May 2014			Felt that CLABSI rate was due in large part to system stress and methods to alleviate stress through additional staffing assistance was the primary driver for improvement

Note: CLABSI, central line associated bloodstream infection; IV, intravenous; CVC, central venous catheter; CDC, Centers for Disease Control and Prevention

Appendix B

Summary of Systematic Reviews (SR)

Citation	Quality Grade	Question	Search Strategy	Inclusion/ Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/Recommendation/ Implications
Schreiber, P. W., Sax, H., Wolfensberger, A., Clack, L., Kuster, S. P. & Swissnoso. (2018). The preventable proportion of healthcare-associated infections 2005–2016: Systematic review and meta-analysis. *Infection Control & Hospital Epidemiology, 39,* 1277 – 1295. doi:10.1017/ice.2018.183	Level III, A	What proportion of hospital acquired infections are prevented by multifaceted infection control interventions in different economic settings?	OVID Medline, EMBASE, CINAHL, PubMed and The Cochrane Library Supplemental table 1 describes search for each database in detail, generally searched nosocomial infection, prevention and multiple interventions Published between January 1, 2005 and October 7, 2016	Inclusion criteria: multifaceted (2 or more) interventions to reduce CAUTI, CLABSI, SSI, VAP and HAP that reported infection rates as an outcome, English language Exclusion criteria: intervention not multifaceted (1 intervention described), insufficient data, patients less than 16 years old, no intervention, no original data, no control group, not a hospital acquired condition of interest, case series, case reports, outbreak reports or ecological studies	Data extraction: two authors independently utilizing standardized data collection form Did not include uncontrolled before-and-after studies due to presumed low quality Described specific characteristics for each study type to assess methodological quality and risk of bias Analysis: None performed if studies reported only aggregate data	Pooled incidence rate ratio (IRR) was 0.459 for CLABSI Largest effect of multifaceted, evidence-based interventions is on CLABSI Reduction occurs regardless of economic status of country the study was implemented in	Focused on the sections of the review that targeted CLABSI Utilization of CLABSI maintenance bundles reduce CLABSI rate with higher adherence rates resulting in greater risk reduction Bundles are variable and include components in education, audit and feedback, daily checklists in addition to other evidence-based performance measures (i.e.

Citation	Quality Grade	Question	Search Strategy	Inclusion/ Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/Recommendation/ Implications
					Utilized DerSimonian and Laird, using inverse-variance fixed-effect model or Mantel-Haenszel model to estimate heterogeneity Degree of heterogeneity calculated using I^2 statistic, defined a priori as >60% Publication bias investigated using a funnel plot and quantified using the Egger test		skin antisepsis, sterile dressing change)
Payne, V., Hall, M., Preito, J. & Johnson, M. (2018, September). Care bundles to reduce central line-associated bloodstream infections in the neonatal unit: A	Level III, A	Is there evidence to support the efficacy of care bundles to reduce CLABSI in infants with	MEDLINE, EMBASE, CINAHL, PubMed with The Cochrane Library, Web of Science, Zetoc and Ethos searched for additional studies	Randomized controlled trials (RCTs), quasi-experimental and observational studies Inclusion: investigated a care bundle for central line insertion or maintenance care, performed in any	Standardized template for data extraction Study characteristics: setting, study design, bundled elements, definition of CLABSI, change	All 24 included studies showed a statistically significant decrease in CLABSI following care bundle introduction, with an average reduction of 60%	Large body of evidence that is quasi-experimental which demonstrates that care bundles may reduce CLABSI in the neonatal unit and may be able

Citation	Quality Grade	Question	Search Strategy	Inclusion/ Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/Recommendation/ Implications
systematic review and meta-analysis. *Archives of Disease in Childhood: Fetal and Neonatal Edition, 103*(5), F422 – F429. doi:10.1136/archdischild-2017-313362.		indwelling central lines in the neonatal unit when compared to the standard care? Which bundle elements are the most commonly used?	Published between January 2010 and January 2017 Two authors performed the search/selection process independently, resolving disagreements by discussion	neonatal unit regardless of care level, English language Exclusion: investigated a single intervention, performed in adult or pediatric population, focused on a specific pathogen outbreak, were a conference abstract	in CLABSI rate and measures of compliance. Newcastle-Ottawa Scale was used for observational studies and Standards for Quality Improvement Reporting Excellence was used for quality improvement. Analysis: rate ratio for the number of CLABSI per 1000 central line days or patient days was calculated with a 95% confidence interval, with a correction of 0.5 applied to zero rates. Meta-analysis was performed		to extrapolate to adult population given the Michigan Keystone project which introduced evidence-based bundles with a patient safety program and ultimately reported zero CLABI Report that no studies found to date have resulted in a negative impact for CLABSI rate

Citation	Quality Grade	Question	Search Strategy	Inclusion/ Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/Recommendation/ Implications
					using random effects modeling Heterogeneity was calculated using I^2		
Ista, E., van der Hoven, B., Kornelisse, R. F., van der Starre, C., Vos, M. C., Boersma, E. & Helder, O. K. (2016, February 18). Effectiveness of insertion and maintenance bundles to prevent central-line-associated bloodstream infections in critically ill patients of all ages: A systematic review and meta-analysis. *Lancet Infectious Disease, 16*,	Level III, A	What is the efficacy of central line bundles (either insertion or maintenance) in the prevention of CLABSI?	Embase, MEDLINE OvidSP, Web-of-Science, Cochrane Library, PubMed and Google Scholar. Basic search terms used: "catheterization, central venous or adverse effects", "infection control or methods", "intensive care units", and "quality control" Published between January 1, 1990 and June 30, 2015 Utilized Preferred Reporting Items for Systematic	Inclusion: implementation of a central-line bundle in an ICU setting with documentation of CLABSI incidence rate, compared pre- and post- via randomized or non-randomized study design, described an intervention to improve the care process in addition to the implementation of the bundle No language exclusions Exclusion: CLABSI incidence not reported	Standardized template for data extraction Study characteristics: study design, setting, county, population age, number of patients, age, sex, severity of illness score, description of the bundle elements, CLABSI definition, implementation strategies, number of infections and catheter-days, compliance measures, cost Primary outcome: number of	Significant association between implementation of central-line bundle and reduction of the incidence of CLABSI in all ICU settings regardless of type and population age Median cost savings from bundle implementation is $42,609	Care bundles reduce CLABSI rates across all age groups CLABSI prevention requires broad practice changes and the implementation of multifaceted programs combined with change in behavior of healthcare workers through education, performance assessment, audit and feedback, teamwork and improvement in the safety culture

Citation	Quality Grade	Question	Search Strategy	Inclusion/ Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/Recommendation/ Implications
724 – 734. http://dx.doi.org/10.1016/S1473-3099(15)00409-0			Reviews and Meta-Analysis guidelines Two authors performed the search/selection process independently, resolving disagreements by discussion		CLABSI per 1000 catheter-days Utilized DerSimonian and Laird random effect model to obtain incidence risk ratios and used 95% confidence interval Heterogeneity was calculated using I^2 Subgroup analysis for CLABSI more or less than 5/1000 catheter days for most effective bundle elements and most effective implementation strategy, p-value <0.05 was significant		Implementation strategy that had the largest effect was the support of opinion leaders Focused on critically ill patients

Note: CLABSI, central line associated bloodstream infection; VAP, ventilator associated pneumonia; CAUTI, catheter associated urinary tract infection; SSI, surgical site infection; HAP, hospital acquired pneumonia; ICU, intensive care unit

Appendix C

Project Schedule

	NUR7801								NUR7802								NUR7803							
Activity	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15
Needs assessment with topic identification in order to identify a problem that contributes to adverse patient outcomes and is part of the current protocolized care	X																							
Identify stakeholders and create interprofessional team which will help lead and support change on the unit	X	X																						
Assess organizational and unit readiness to change and support evidence-based practice	X	X																						
Literature review and creation of evidence tables	X	X																						
Identify appropriate nursing theories		X																						
Identify project outcomes, measures and create data collection protocol, create a strategic vision for the project		X	X																					
Establish methods and timeline for communication with participants, preceptor and unit manager during and after intervention				X																				
Create a budget and analyze resource needs							X																	
Develop education for nursing staff and identify number of in-services will need to be completed based on staffing							X																	
Develop project proposal	X	X	X	X	X	X	X	X																
Guidance through IRB approval with submission to facility and USA, obtain electronic health record access for chart review									X	X														
Have the dressing change section in the electronic																								

	NUR7801								NUR7802								NUR7803							
Activity	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15
health record adjusted to allow for a co-sign area to document the two-person dressing change technique was performed										X														
Create signage for unit bulletin board with contact information to empower members on the unit to act and participate fully in the project implementation										X														
Compile background data										X														
Educational sessions for project implementation with time for re-education and multiple sessions over two weeks											X													
Project implementation period												X	X	X	X	X								
Assess nursing performance following 1 week of implementation including problems with implementation, questions/concerns regarding adherence												X												
Compile data for prior week findings, address nursing concerns, update bulletin board with general questions and successes to give nursing staff small wins or knowledge that they are creating positive change												X	X	X	X	X								
Halfway point - assess nursing adherence and performance, provide update to stakeholders with outcomes to date, make changes if needed to streamline or increase practicality														X										
Provide education refresher course for implementation to nursing staff based on identified needs/adherence to date														X										
End of implementation phase																	X							
Thank you party/celebration for nursing staff																								

	NUR7801								NUR7802								NUR7803							
Activity	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15
																	X							
Data collection for raw data for primary outcome and other measures																	X	X	X					
Data analysis and evaluation of outcomes, measures																			X	X				
Determine sustainability of project through budget reconciliation, nursing and administration feedback, project strengths, weaknesses and limitations																				X	X			
Present key findings to stakeholders, nursing, administration and institutionalize change to make it the new norm																						X		
Arrange/schedule and present school of nursing research day presentation																							X	
Disseminate findings to University of St. Augustine																								X
Completion of DNP																								X

Appendix D

CLABSI WILDCARD

Date: **Time:** **Unit:** **Coach doing the Wildcard:** **RED BLUE**	
Why are prevention bundles important for your patient and the work you do?	
Is this central line necessary? Why? YES NO	
Hand hygiene YES NO	
CLABSI prevention bundle components present:	
YES NO N/A	Dressing clean, dry, intact , dated, & initialed
YES NO N/A	Dressing changed every 7 days (KCH) or every Wednesday (Adults) (documentation)
YES NO N/A	Antimicrobial dressing present and clean/dry/appropriately placed
YES NO N/A	CHG treatment within past 24 hours (if applicable) (documentation)
YES NO N/A	All ports covered with alcohol caps (also, nurse should verbalize scrub the hub for 15 seconds with alcohol or CHG for line entry when asked how to access)(documentation)
YES NO N/A	Tubing/end cap change every 96 hours routinely and PRN per policy NI08-16 (documentation)
Card is BLUE if "all items are compliant." ***Perfect CLABSI prevention bundle achieved!*** **Thank staff for time and engagement!**	
Comments:	

Appendix E

Organizational Permission to Utilize WILDCARD

DNP Project

Blanton, Kimberly C.
Fri 1/29/2021 10:36 PM
To: Comstock, Jessica W.
Cc: Buckler, Lacey T.

Hello Jessica,

I heard back from Paula Holbrook, Risk Manager. She approved you to use this information. So we can move forward with this project!

Kimberly Blanton, DNP, MHA, RN, NEA-BC
UK Healthcare
Enterprise Nursing Operations Director
IPAC, Interventional Services, & CV Service Line
CTW 320P
Lexington, Ky. 40536
Office: 859-323-8660
Mobile: 859-576-9086

DNP Project

Comstock, Jessica W.
Tue 1/26/2021 9:38 AM
To: Blanton, Kimberly C.

The data collected will be through daily CLABSI WILDCARD completion and will include adherence to the bundle and the comments section of the WILDCARD will be used to track adherence to the intervention, or 2 person dressing change for central lines. The data will be shared in my final DNP presentation/paper and for dissemination at the university level. Additional permissions will be sought if shared outside of these two locations. UK will be referred to as "the institution" or "enterprise" and not be mentioned specifically in any documentation.

Thank you,
Jessica

> On Jan 26, 2021, at 9:05 AM, Blanton, Kimberly C. <kblanton3@uky.edu> wrote:
>
> Jessica,
> We have to get permission from the risk management department.
> Can you send me the objective or short written proposal including what data you need and what and who you will share this with. I have to use that to get you appropriate permissions.

Kimberly Blanton, DNP, MHA, RN, NEA-BC
UK Healthcare
Enterprise Nursing Operations Director
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Appendix F

Dressing Change Steps with a Sterile Buddy

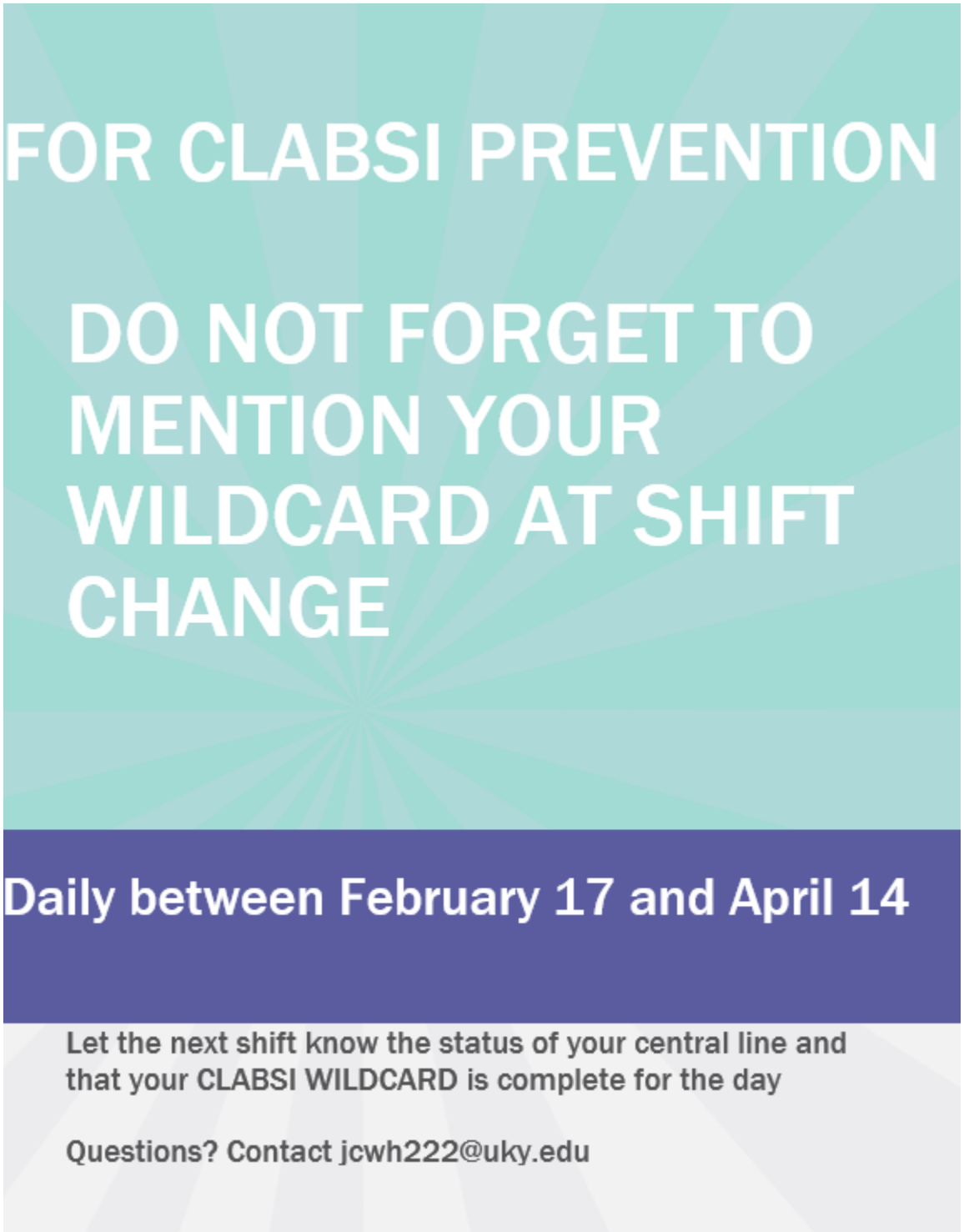
1. Preparation: The nurses will enter the patient's room with all of their standard supplies for a central line dressing change including new sterile dressing, sterile gloves, non-sterile gloves, pen to mark date on new dressing, and chlorhexidine sponges. The nurses will perform hand hygiene, place a mask on themselves and the patient, and perform hand hygiene again. The primary nurse will don non-sterile gloves and prepare a saline syringe for use in case of resistance from the adhesive chlorhexidine square. The sterile buddy (SB) will don sterile gloves.
2. Dressing removal: The primary nurse will remove the dressing pulling low and slow from the distal edge of the dressing toward the insertion site. The SB will place a sterile finger on the line as it is exposed beneath the dressing to keep it in place while the primary nurse continues to remove the dressing. If the chlorhexidine is stuck to the line, the primary nurse may drop sterile saline from above onto the chlorhexidine sponge to encourage its release.
3. Once the dressing is removed by the primary nurse, they will remove their non-sterile gloves and perform hand hygiene again. The SB will step out of the sterile field to observe the primary nurse for the following steps, making sure to maintain the sterility of their hands should the primary nurse need assistance.
4. Cleansing the line insertion site: The primary nurse will establish a sterile field with a sterile drape, open their chlorhexidine sponges and new central line dressing onto their sterile field and apply sterile gloves. The primary nurse will scrub the catheter site and surrounding skin for 30 seconds with the chlorhexidine sponge and then wait for the site

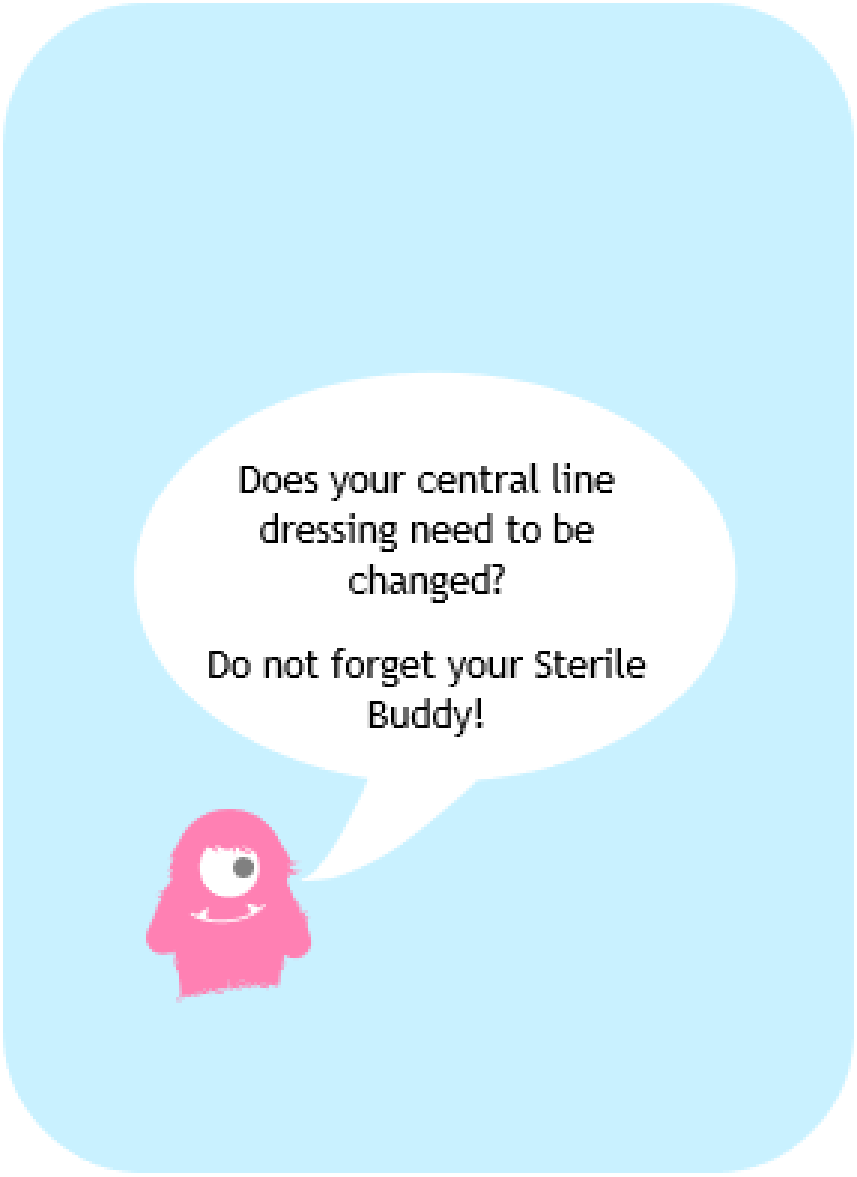
to dry without fanning or waving. The SB will monitor their technique and stop the procedure in case of potential site contamination.

5. New dressing application: Once the site is dry, the primary nurse will apply the new central line dressing. Once the dressing is adhered, the primary nurse and sterile buddy will clear their sterile field, remove their sterile gloves, and perform hand hygiene. The primary nurse will then label the dressing with the date, time, and their initials. The SB will then remind the primary nurse to document the dressing change in the electronic health record and co-sign the record to show the use of the two-person dressing change technique.

Appendix G

Unit Signage for Project Implementation




Does your central line dressing need to be changed?
Do not forget your Sterile Buddy!

Appendix H

Project Measures

Measures	Categories					Data Type	Statistical Test
	Outcome	Process	Financial	Sustainability			
CLABSI Rate	X					Ratio	One sample t-test
ICU length of stay	X					Ratio	One sample t-test
Central line days		X				Ratio	One sample t-test
Rate of checklist completion		X				Ratio	n/a
Rate of use, two-person dressing change		X				Ratio	n/a
Estimated cost savings from CLABSI reduction			X	X		Ratio	n/a

Appendix I

Data Collection Tool

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Number of central line dressing changes								
Number of CLABSI								
Number of WILDCARDs completed								
Number of times Sterile Buddy Used								

Appendix J

Budget

EXPENSES	
Nursing Salary Cost of hourly salary for critical care nurse is $35/hour, 170 nurses, watching an information video and discussing in-person through just-in-time education throughout the implementation, 1 hour total	$5950
Information Technology Salary Cost for employee to pull WILDCARD data, 4 hours, assuming $60,000/year average salary or $29/hour	$116
Supplies Cost of paper for unit signage and bulletin board, $0.49/page with an estimate 50 pages required	$24.50
Total Expenses	$6090.50