**Prevention/Intervention of Central Line Associated Bloodstream Infection (CLABSI)**

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NURS 403: Transition to BSN Practice

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June 22, 2024

**Prevention/Intervention of** **Central Line Associated Bloodstream Infection (CLABSI)**

The best intervention for CLABSI is prevention. The best way to reduce the rate of CLABSI in hospitalized patients is through prevention. Central line associated bloodstream infection (CLABSI) is indicated when a positive blood culture is obtained from a patient who has a central line. A central line-associated bloodstream infection (CLABSI) is defined as the recovering of a pathogen from a blood culture in a patient who had a central line at the time of infection or within 48 hours before the development of infection (Haddadin et al., 2022). Most central lines are seen on patients in the intensive care units (ICU) or a stepdown unit. Sometime, central lines can be found in patients who are receiving life sustaining intravenous treatment. Some central line stays in a person for years, some for a period of antibiotic treatment course, while some are found on the critical care units in a hospital setting.

This paper discusses CLABSI on a stepdown unit in a hospital setting. A unit of about eighteen beds, and nurse to patient ratio of five to one (5:1) maximum. Eighty-five percent (85%) of the time, nurses work with no patient care assistants (PCA). The issue of CLABSI is not shift specific because everyone/nurses who care for the patient with a central line is responsible for prevention and intervention of CLABSI. To be shift specific as it relates to the requirement for this paper, night shift is the shift of choice for this paper. In discussing CLABSI prevention, one must understand what CLABSIs are and what type of central lines expose a patient to those pathogens.

**Central Venous Lines (CVL)**

Central venous Lines are surgically inserted venous device to create an access for intravenous treatment. The insertion of CVL is indicated for patients in critical phase of their treatment or patient getting a long-term antibiotic treatment. Central venous lines are indicated when it is necessary to ensure that proper route of treatment is utilized. The type of line is determined by the type of intended treatment. The three major CVLs are peripherally inserted central catheter (PICC), tunneled hemodialysis catheter or tunneled dialysis catheter (TDC), and an implanted port. Among the three CVLs, PICC is the most used in hospitalized patients. These three devises have preferred insertion sites that range from chest, lateral abdomen, internal jugular, subclavian, femoral, and is advanced until the terminal lumen settles within the inferior vena cava, superior vena cava, or right atrium (Kolikof et al., 2023). The type of CVL and the insertion site contributes to the risk level, and rate of CLABSI.

**Central Line Associated Bloodstream Infection (CLABSI)**

**What is CLABSI**

 The prevention and intervention of CLABSI starts with understanding what CLABSI is, contributing factors, prevalence, and its significance. CLABSI is an infection of the bloodstream caused by pathogenic organisms. The following are the CLABSI causing organisms and their percentages based on the National Healthcare Safety Network (NHSN) data, the most common pathogens associated with causing CLABSI are Gram-positive organisms (coagulase-negative staphylococci 34.1%; enterococci 16%; and staphylococcus aureus 9.9%), while the gram-negatives are (klebsiella 5.8%; Enterobacter 3.9%; pseudomonas 3.1%; E.coli 2,7%; Acinetobacter 2.2%), candida species 11.8%, and others pathogens make up 10.5% (Haddadin et al., 2022). The

**Prevalence and significance of CLABSI**

The prevalence and significance of CLABSI cannot be underestimated. In a study on patients receiving some hazardous medicine through PICC alone, 25 (5.2%) of 539 PICC in 484 patients were positive for CLABSI with nine months (Lee et al., 2020). Another study on CLABSI estimated that 250,000 bloodstream infections occur annually, and most are related to the presence of intravascular devices. In the United States, the CLABSI rate in intensive care units (ICU) is estimated to be 0.8 per 1000 central line days (Haddadin et al., 2022). CLABSI significantly affects the health of patients by increasing length of hospitalization, increase cost, and in some cases deadly. A prolonged hospital stay places a patient on higher risks of hospital acquired infection, muscle and bone weakness, stress, all which can contribute to delayed healing.

In a study by Toor et al., (2022), CLABSIs carry a mortality rate of 12%-15% and an odds ratio of in-hospital death is as high as 2.75. It has both medical and economic impact on both patients and the hospitals. LABSIs are also associated with increased length of hospital stay and increased healthcare cost with each case accounting for approximately $46,000 (Toor et al., 2022).

In the cases of CLABSI, more resources are utilized, more labs and diagnostic procedures are needed, and these exert extra cost of patients and hospitals. Patients require extra care and attention. The care team (nurse, physicians, PCAs) and other teams involved in the patient’s care a burdened with workload. Stressful assignments may affect details to care, efficacy, and the effectiveness of care provided, which also increases the risk for CLABSI.

**Risk/Contributing Factors to CLABSI**

Central lines are essential devices for some hospitalized patients. Indicates based on the type of medication, and treatment a patient is receiving, and diagnosis of the patient. When a central venous line is inserted in a patient, the risk of getting a bloodstream infection increases. Some patients are hemodynamically unstable and are prone to pathogen invasion, having a CVL is a greater risk factor. There are many contributing factors to CLABSI, and they include but not limited to patients receiving chemotherapy; total parenteral nutrition (TPN); Immunocompromised patients; patients with kidney disease, diabetes mellitus; multiple lumen CVL, long-term catheter uses and more. So, some practices are necessary to protect patients with CLV.

**Current Clinical Practice**

In the health care organization where I work, there is currently a policy on the care of central venous lines (CVL). The standard policy is proper hand hygiene, line dressing changes every seven days, and the use of 2% Chlorhexidine gluconate wipe to clean patients (CHG bath) with CVL. This is what is expected of the nurses, PCAs who provide care to the patients. Contrary to giving CHG bath, my observation is that more emphasis is laid on documentation than the actual recommended intervention. For example, the unit manager or the clinical care leader comes in the morning, the first thing they do is check the hygiene section of patient’s chart to see if CGH bath is documented. To avoid confrontation, some nurses will document that CHG bath was done when it was not done.

Furthermore, CHG bath becomes the object of discussion every morning on my unit. In my opinion, the approach to enforcing CHG bath is negatively presented and focusing on CHG bath alone eliminates the reinforcement of other preventative factors. Another discrepancy of the CHG bath is that they try to make the responsibility of night shifts nurses. Although, the policy or protocol does not state that. CGH bath should be given every shift, but the unit leaders expect nurses to document CHG bath in the AM hours, thereby given coverage to day shift. Though, some nurses do give the CHG bath during their shift. If both day and night shift are held accountable, the patient stands a higher chance of getting the CGH bath every 24 hours at least.

**Three Proposed Intervention Interventions**

**Dry/Gauze Dressing Change**

One of the undermined CLABSI preventions is the approach to CVL dressing change. Though, there are different kinds of CVL dressing, and a standard policy to change the dressing when soiled and every seven days, compliance rate is questionable. So, implementing the use of dry dressing for CVL, and every 48 hours (two days) dressing change against the seven days clear dressing change seem like a better approach. Changing the dressing every two days increases the possibility of the dressing being changed at least three times in seven days. According to a nursing journal by Paquet et al., (2021), in the 12 months following the change in practice, we noted a CLABSI reduction from 2.36/1,000 catheter days to zero, improvement in dressing audits from 19.61% to 85.34% of clean dressings (p=0.00001) and 62.75% to 90.58% of adherent dressings. The study concluded that in this pre-post study, a simple change in dressing type was implemented, resulting in a significant reduction in the CLABSI rate (Paquet et al., 2021),

**Dedicated Registered Nurse CLABSI Prevention Role**

 Staffing shortage and heavy workload are some of the contributing factors to the discrepancies in central line care and CLABSI prevention. It is not news that since COVID-19 pandemic, there is an increase in hospital acquired infection rate. The more there is patient on contact precaution in a unit, the higher the risk for potential CLABSI in patients with CVL. Recent studies support the use of a dedicated registered nurse role in prevention of CLABSI. The implementation of the CLABSI P-RN was beneficial in reducing CLABSIs. An expert-trained role dedicated to central line management reduces CLABSI occurrences, reduces health care costs, and improves patient outcomes. CLABSI Prevention RN role was associated with a reduction in CLABSI occurrences (Star et al., 2024). By dedicating CVL to registered nurses whose role is the care and oversee CVL, there will be a reduction in CLABSI.

**Limiting CVL Routine Blood Draw**

Drawing blood from a CVL may seem easy to nurses and phlebotomists but it increases the risk for CLABSI. Each time a central line is accessed, patients are potentially exposed to possible pathogens. A policy that limit blood drawn through CVLs is another way to prevent and reduce the rate of CLABSI in CVL patients. This method of intervention is supported by evidence-based studies. Data collected supported that decreasing the use of CVLs for routine blood draws can decrease the number of times CVLs are accessed per shift and decrease the CLABSI rate (Kuriakose, 2020). AS a registered nurse who work in a critical care unit, it troubles me to draw blood from a CVL that is being used for TPN or heparin drips. Considering the process of drawing a non-contaminated blood from a CVL that is actively in use, the intravenous treatment being given is held for at least an hour, and about 20 milliliters of blood will be waisted before drawing the blood for laboratory (lab) test. For patients who may need every four hours lab drawn, this means accessing the CVL multiple times in a day and wasting an increasing volume of blood.

**Analyzing** **Current Research and Clinical Problem**

There is much research on CVL care and CLABSI prevention. Some research supports CHG bath on patients with CVL decreases CLABSI (Peixoto et al., 2024). Different studies present different care packages, some of which consist of the standard hand hygiene, single lumen CVL, alcohol caps and alcohol wipes, while some focus on the CVL insertion process, and many more. Considering all the studies and recommendations for CVL care, the prevalence of CLABSI is still on the rise in many hospitals. This clinical problem is an evident of unprovided CVL care and poor CVL care. When nurse poorly follow recommended intervention procedures, the provided intervention becomes ineffective. Most nurses are professionals in documentation than in providing intervention. The leaders are in part to blame because they only focus on documentation.

**Hypothesis**

Patients who received gauze dressing and their CVL dressing is changed every two days have a higher chance of getting their dressing changed than patients who receive transparent dressing that is changed every seven days. Another hypothesis is that patients in a unit with dedicated registered nurse whose role is CVL care, will have less CLABSI cases than patients in a unit with a standard CVL policy. Another hypothesis is that patients whose CVL are less frequently accessed have a lower risk of CLABSI than patients whose CVL are accessed frequently.

**Conclusion**

CLABSI is a major health issue in people with CVL but also preventable. The use of dry/gauze dressing change and changing the dressing every two days will increase the probability of the dressing getting changed at lease three times in seven days. Gause dressing is simple and easy. When done properly, it means that the CVL will be assessed, and any abnormality will be noted early. While using a dedicated registered nurse whose role is CVL care and CLABSI prevention will focus solely on CVL care and prevention. This also means that the dedicated role nurse will be responsible in explaining a higher incidence of CLABSI. In a more beneficial perspective, patients will benefit from receiving special attention to CVL care.

Moreover, limiting CVL routine blood draw is also an important prevention intervention. Each time a CVL is accessed, the risk for CLABSI increases. Each time blood is drawn from the CVL, the risk for complications which include infectious disease increases. CLABSI prevention is very important because it contributes to comorbidity and mortality in hospitalized patients. Following a proper evidence-based intervention recommendation is important in reducing CLABSI incidence, reducing hospital stay, promoting health and healing, and reducing cost.

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