Preventing catheter-related blood-stream infections: Quality Improvement

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Central venous catheters (CVCs) are essential in treating critically and chronically ill patients. A CVCs use is to give medications, fluids, nutrients, or blood products. These types of catheters have the ability for use over extended periods of time. While CVCs provide a variety of methods to care, they also can cause many complications. According to Wang et al. (2018), "catheter-related bloodstream infections (CRBSIs) are the most common complication when using central venous catheters" (Wang et al., 2018, p. 1). By implementing ways patients and their interdisciplinary teams can reduce these complications would mean active progression and quality improvement toward preventing catheter-related bloodstream infections. Quality improvement uses data to monitor and evaluate improvements to ensure quality and safety in the healthcare setting. The QSEN presents proficiency in quality improvement with knowledge, skills, and attitudes. The knowledge portion focuses on how nursing and medical professionalism can influence patient care quality. Furthermore, knowledge also bases learning around critical thinking within the clinical setting. Skill set includes the use of research and quantification to enhance patient care. Attitudes determine the results of quality improvement. Positive outlooks further strengthen healthcare team collaboration (QSEN Institute, 2020).

Article Summary

Catheter-related bloodstream infections are the most common complication when using central venous catheters. The data that regards nursing knowledge and practice of the factors that cause these infections are restricted. This study focuses on the effects of antimicrobial-coated central venous catheters and assesses the knowledge, practice, and methods nurses and healthcare providers use to prevent infection.

Introduction

The authors describe the effectiveness of antimicrobial-coated central venous catheters and bundles for preventing catheter-related bloodstream infections. The Institute recommends bundle insertion procedures for Healthcare Improvement. There are five components to the bundle insertions: "hand hygiene, maximal barrier precautions, chlorhexidine skin antisepsis, optimal catheter site selection, and daily review of central line necessity" (Wang et al., 2018, p. 2). A study done on the systematic review and network meta-analysis spectrum. The outcome based on the rate of CRBSIs per 1000 catheter days and incidences of catheter infections. The study included 10,464 patients who were picked at random to receive one of four types of CVCs. The four types of CVCs chosen were: a conventional standard catheter, an antibiotic catheter, a chlorhexidine/silver sulfadiazine treated catheter, or an oligion vantex silver treated catheter. The results showed that over 50% of CRBSIs occurred in conventional, standard catheters and a large portion of the remaining studies had catheter colonization as a secondary outcome. The overall results showed that the antimicrobial-coated catheters were most effective compared to the silver CVCs, which reduced microbial growth but did not reduce CRBSIs.

This article is linked to nursing impacts as nurses are the primary healthcare team that are responsible for maintaining catheter care and cleanliness. Nurses take care of a variety of different kinds of catheterizations. It is important as a nurse to keep records of input and output, maintain drainage if necessary, and maintain general hygiene around the catheter (Teshager, 2022).

Overview

As the article stated, “catheter-related bloodstream infections (CRBSIs) are the most common complication when using central venous catheters” (Wang et al., 2018, p. 1). As a nurse, it is important to be aware of complications that can arise from catheterizations, especially with longer-term catheters. Quality improvement (QI) monitors the outcomes of care processes and uses that information to provide methods that continuously improve the quality and safety of healthcare. Clean and aseptic techniques are valuable measures that play a role in good patient care (QSEN Institute, 2020).

Quality Improvement

The article states that while data develops, most of those comparisons showed little to no “heterogeneity” (Wang et al., 2018, p. 4). With the given information, the overall results showed that the antimicrobial-coated catheters were most effective compared to the silver CVCs, which reduced microbial growth but did not reduce CRBSIs (Wang et al., 2018). Taking this information and relating it to the QSEN competency, quality improvement would show that the use of measures to evaluate the effect of change and coming up with strategies to positively change the process of care is to implement antimicrobial-coated catheters and bundles with catheter infection prevention.

The suggested change of implementing antimicrobial-coated catheters could impact the institution financially, patient and nursing satisfaction, and increase patient and nursing safety (QSEN Institute, 2020). These catheters, if not already provided within the specific hospital’s system, could be a costly change. Patient and nursing satisfaction and safety could go up due to the antimicrobial coating. This change could show a decrease in colonization growth, freeing patients from infection.

Application to Nursing

Nurses are the predominant healthcare team responsible for inserting and maintaining the majority of catheters. Applying knowledge and practice to the prevention of catheter-related bloodstream infections and catheter-associated infections in general towards nursing practice is essential for patient care. Increasing the knowledge of catheter-related infections for nurses through proper training and preventative measures is necessary for professional work experience (Teshager, 2022). Proper training and preventative measures for desired outcomes require guidelines, protocols, and standards for the proper technique of catheter insertion (Teshager, 2022). Improving education and preventative measures early on is essential for proper patient care.

Practice

In regard to this topic, the best nursing practice would be education. Educating proper techniques to reduce catheter-related infections improves nurses' experience and provides patients with proper care. A recent study in Ethiopia found that nurses' knowledge and practice in preventing catheter-associated infections were poor (Teshager, 2022). Along with proper education, "availability of resources and present guidelines in the health facility has a positive impact on the knowledge and practice towards prevention" (Teshager, 2022, p. 2). Increasing these educational programs and training on preventative measures for catheter-associated infections would also increase patient satisfaction.

Education

Education programs discussing proper care and catheter maintenance are essential for protecting patient health. Nurses first learn basic training within a nursing program as a student. It requires students to pass specific techniques to move forward within the program. Nursing students also gain knowledge and experience while in the clinical setting. The clinical aspect of a nursing program is for students to see the role of a nurse put into action. Allowing students to see how things are running in a hospital setting allows room for critical thinking and using the knowledge learned from the classroom. Critical thinking involves minimizing errors and maximizing positive outcomes during patient care (Van Nguyen, 2021). Ongoing catheter care and aseptic technique training are necessary for upholding practice, protocol, and standards.

Research

Further research's priority is improving guidelines, protocols, and standards. Knowledge, practice, and methods nurses and healthcare providers use to prevent infection are crucial in reducing catheter-related infections and making patient care a positive experience. Concerning antimicrobial-coated catheters, further research needs to explore the potential use of these catheters for extended periods (Wang et al., 2018). Proper catheter placement, including aseptic technique, quality maintenance, and attention to attitude, is vital in preventing catheter-related infections (Teshager, 2022). If research continues on this topic, care for patients requiring catheter insertion will decrease hospital-acquired infections.

Conclusion

The QSEN competencies introduce proficiency in quality improvement with knowledge, skills, and attitudes. Knowledge focuses on the relationship between nursing and medical professionalism influencing the quality of patient care. Skill set refers to the research and

methods used to improve healthcare quality and enhance patient outcomes. Attitudes contribute to quality improvement by creating a positive and continuous learning environment to strengthen healthcare team collaboration (QSEN Institute, 2020). Aseptic technique and quality maintenance of catheters are essential to infection prevention, and antimicrobial-coated use may decrease the infection-causing bacteria colonization. Having quality improvement to decrease catheter-related bloodstream infections will increase patient satisfaction.

References

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