Quality Improvement Initiative to Improve Pediatric CLABSIs Rates

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Quality Improvement

Quality and Safety Education for Nurses (QSEN) is a national initiative to improve patient outcomes by enhancing nursing education and improving nursing skills. An example of this is how QSEN has worked using quality improvement to identify and prevent central line-acquired bloodstream infections (CLABSI). QSEN often uses health-care professionals, relying heavily on nurses specifically, to identify problem areas and ways to improve the health-care system (Quality and Safety Education for Nurses Institute, n.d.). CLABSIs are highly preventable, very serious complications of having a central line, but can also be life-threatening or fatal. Most patients who have a central line are immunocompromised and far more susceptible to infection. CLABSIs, especially among the immunocompromised population, increases the morbidity risks, mortality risks, hospital stays, and hospital costs (Odada et al., 2023). There are approximately 250,000 bloodstream infections every year, most of which are correlated with intravascular devices, such as central lines (Haddadin et al., 2022). CLABSIs contribute to 30,000 deaths per year, and specifically relating to pediatric patients, they cause a patient to be admitted for 19-21 days longer and an estimated cost of $55,000-$69,000 per infection (Hugo et al., 2022). QSEN identifying this issue and organizing a quality improvement initiative to improve on CLABSI rates has been instrumental in reducing infection rates related to CLABSIs. They are often due to breaking sterile techniques and improper management of an accessed line by healthcare providers, which allows the introduction of bacteria into the central line (Haddadin et al., 2022). QSEN identified different problem areas most commonly associated with sterility issues and ways to improve those for the better of the patient. In this initiative, by performing rounds called Rounds for Influence (RFI) regularly, identifying problematic practices, and

starting a more universal evidence-based practice, this quality improvement initiative was able to lower the CLABSI rate from 0.9% in November 2017 to 0.53% in June 2021 (Hugo et al., 2022).

Article Summary

This article explores the ways in which nurses started RFI within a major children's hospital to assess specific criteria which increase CLABSI rates. They focused on seven inpatient units, including an ambulatory infusion center, pediatric intensive care unit, comprehensive cardiac care, neonatal intensive care, stem cell transplant/hematology/oncology, and three surgical and medical acute care units to bring uniformity to central-line care, identify failures with central-line access and maintenance, and ways to improve these to lower the rates for CLABSIs. What this study termed as the "CLABSI prevention team" used three specific tools to assess central-line care: line access, dressing change/port needle insertion, and cap change. Using these three tools, the CLABSI prevention team implemented nine plan-do-study-act cycles to lower CLABSI rates and improve patient outcomes. Using a mixed methods approach, this QSEN initiative lasted 2.5 years to improve central- line standards and compliance and decreased central-line infections from 0.9% to 0.53% (Hugo et al., 2022).

Introduction

This article is from a mixed methods study to improve patient outcomes and nursing competency by identifying problems with central-line care and maintenance and decreasing CLABSI rates. This initiative utilized nursing staff specifically dedicated to central-line care to reduce CLABSI rates. They were able implement specific checklists when performing central-line care during line access, dressing changes/port needles insertion, and when cap changes were

needed. This initiative was able to reduce CLABSI rates within this facility by performing rounding within the areas of the facility most commonly associated with central lines, therefore also holding the highest CLABSI rates.

Overview

This article focused on the areas within the facility that had the highest CLABSI rates, which also happened to be where most central-line care was performed, the staff performing the central-line care, and where there were problematic practices accounting for increased CLABSI rates (Hugo et al., 2022). CLABSIs occur when bacteria are introduced into the bloodstream. The most common causes of CLABSIs are improper sterile techniques, improper management of an accessed line by healthcare providers, and prolonged port access. The bacteria most commonly associated with CLABSIs are gram-positive organisms, followed by gram-negative organisms (Haddadin et al., 2022). This article highlighted the input of nursing staff who are most commonly the healthcare team members providing care for central-lines, ways to improve practices and evidence-based practices to improve nursing competencies and patient outcomes by providing standards for central-line care, and reduced CLABSI rates.

Quality Improvement

This RFI quality improvement initiative used nine plan-do-study-act criteria to identify problematic practices with line access, dressing change/port needle insertion, and cap changes. The nine criteria were maintenance bundle, dressing and cap changes, patient hygiene (chlorhexidine gluconate (CHG) bathing, linen and gown changes), line access, method of collection, chart review, direct observations, flaws in collections, and a cluster of other criteria

including incomplete observations/poor auditor training/selection bias of convenient cases/low volume audits/no real-time feedback (Hugo et al., 2022). This study concluded the most common risk factor for CLABSI infection was maintenance bundle noncompliance among nursing staff. A maintenance bundle is a collection of evidence-based practices used to prevent healthcare acquired infections (HAIs) and improve patient and nursing outcomes (Hugo et al., 2022). Due to the identification of maintenance bundles being the most common cause of CLABSIs, the RFI focused highly online access practices, dressing and cap changes, and daily hygiene of the patients. The biggest component to this RFI initiative was the rounding practices (Huge et al., 2022). There were thirteen registered nurses chosen to be “peer influencers” to perform rounding on each of the critical floors of focus listed above. They would stand by to observe central-line practices and provide feedback and education in real-time to the performing nurse. This allowed the nursing staff to learn proper techniques, be aware when the protocol was broken, and immediately make corrections accordingly. By doing this, the RFI initiative was able to lower CLABSI rates and improve patient outcomes and nursing competencies (Hugo et al., 2022).

Application to Nursing

By utilizing nursing staff to form the RFI, this added cohesion among the floor nurses which made them more receptive to the education and guidance provided. The real-time feedback during rounding showed where common failures in practice occurred, ways to improve these practices, and set standard protocol pertaining to central-line care (Hugo et al., 2022). The RFI chose specific elements to improve CLABSI rates. These element included hand hygiene, clean gloves, alcohol impregnated cap use, masks worn by personnel during dressing changes/port accesses, removing old dressings with clean gloves, sterile gloves used for accessing central-lines, appropriate antiseptic used to clean the patient’s skin, appropriate technique when cleaning the patient’s skin and maintaining the sterility of the procedure,

changing the catheter at appropriate times (at least one weekly unless soiled and then immediately), and appropriately cleaning the tubing each time it is accessed (Hugo et al., 2022). By the trained RFI being present to provide education and guidance, this meant if the nurse cleaned the end of the tube and placed it on the bed to reach for something else, this contamination was caught and corrected immediately, which reduced the risk for infection to the patient, therefore improving patient outcomes and nursing competencies.

Practice

Because central-lines go directly into the bloodstream, often the heart, and the patients can often be immunocompromised, the current best practice guidelines for central-line care are highly specific and often require training for nurses to be approved to perform central-line care (Hicks et al., 2023). To properly perform a sterile insertion of a central line, performing good hand hygiene, aseptic technique, maximal sterile barrier (hairnet, mask, gown, sterile gloves, full body drapes), preparation of the intended insertion site with CHG, securing the catheter with a suture or clamp, and placement of a sterile dressing over the insertion site (Hicks et al., 2023). For routine manipulation of a central-line, cleaning with alcohol or CHG swabs, use of nonsterile gloves, soap and water or alcohol hand scrub, and catheter hub locks are recommended (Hicks et al., 2023). This is often the requirement for when the port is already accessed, and the nursing staff is administering drugs or fluids via the central-line tubing. For a sterile dressing change, best practice recommendations include the provider wearing a hairnet, face mask, sterile gloves, CHG preparation, sterile gauze, Biopatch or CHG-containing dressings, and covering the site with transparent, sterile dressing to allow the nurse to assess the site regularly for signs of infection (Hicks et al., 2023). By having a specific and orderly protocol to follow and only allowing specialized trained nurses to perform central-line care, this has helped to reduce the

CLABSI rates, cut hospital costs, improve nursing competencies, and greatly improve patient outcomes and satisfactions (Hicks et al., 2023).

Education

CLABSI rates are naturally higher when a provider is uninformed or unfamiliar with appropriate central-line practices. Different facilities have varying educational and training requirements for central lines, but they often include a mix of online and hand-on education. These can include computer programs, instructor training, and hands-on patient care. If trained properly with strict guidelines, CLABSI rates should be very low (Hicks et al., 2023). Among highly reputable facilities, it is a common practice to only allow central line trained nurses to access porta catheters. For example, the emergency department (ED) staff at Saint Louis Children's Hospital will not access a central line for an oncology patient, but they will call up to the 9th floor hematology/oncology nursing staff to report to the ED to access the child's central line. Hematology/oncology nurses are trained and very familiar with the appropriate central line protocol, which reduces the risk for CLABSIs throughout the facility. Many facility requirements for online central line care must be completed yearly to ensure the best up-to-date practices (Hicks et al., 2023).

Research

Further research regarding CLABSI risks should include when the patient is at the highest risk for a CLABSI, what factors increase the risk for a CLABSI, and continuing to investigate common protocol errors which lead to CLABSIs. There will be times when a patient is more likely to acquire a CLABSI infection leading to a fatality, such as a neutropenic patient

undergoing chemotherapy. There is research being conducted which investigates regions of the country that have higher CLABSI rates and whether those rates are connected to environmental issues. Ensuring all facilities follow strict protocols, and continuing to research the most common breaches of the protocols will also improve patient outcomes. Since this is a serious, preventable complication for patients, the need for further research will never reach an end until the CLABSI rate reaches zero.

Conclusion

Quality improvement is a necessity in the healthcare field since patient lives are so greatly affected. A CLABSI can cause a snowball effect on the body by entering the bloodstream, affecting every body system, and if left untreated or it reaches uncontrollable levels, lead to death. The national average for CLABSI rates is 0.87% (Toor et al., 2022). By this facility putting the RFI initiative into practice, they were able to drop their CLABSI rates below the national average to 0.53%. QSEN's national initiative to improve patient outcomes by enhancing nursing education and improving nursing skills has made major strides in positive patient outcomes. By relying on the use of health-care professionals, especially nurses, for their input, direction, and identification of strategies toward improvement, the healthcare system is always improving (QSEN, n.d.). The RFI implementing practices of direct observation and real-time feedback and education, there was a vast improvement in patient care, outcomes, and satisfaction, with decreased hospital costs and patient stays. The satisfaction and competencies among the nursing staff also increased. Using a peer-influenced initiative was able to provide the guidance and results desired in a highly productive manner (Haddadin et al., 2022). Quality improvement is an ongoing initiative always striving to make improvement in every aspect of patient care. Nurses are a first line for patients, and nurses must continue learning and improving

their skills in all aspects of patient care, especially in regard to preventable complications such as CLABSIs.

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