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Education Program for Critical Care Nurses on Preventing Catheter-Associated Urinary Tract Infections

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Abstract

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MSN, South University, 2016

BSN, Brenau University, 2011

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

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Abstract

Catheter-associated urinary tract infections (CAUTIs) are the most frequently reported hospital-acquired condition, affecting more than 560,000 patients each year. CAUTIs prolong hospital stays and increase health care costs, and they can result in patient morbidity and mortality. Nurses can be empowered by receiving education and knowledge to manage and identify urinary catheters that are not clinically indicated. The purpose of this project was to develop an education program on CAUTI prevention for critical care nurses using the teach-back method. The conceptual framework that guided this project was Knowles's adult learning theory. The theoretical model was based on 4 fundamental assumptions of self-concept development. A total of 32 critical care unit nurses participated in the evaluation of the teach-back method. Demographic data were collected from these 32 participants, and the results of a frequency analysis were obtained. Deidentified CAUTI data were provided by the organization prior to the educational intervention. The postintervention CAUTI rate and increase in nurses' knowledge level were evaluated 1 month after the educational intervention using a 1-sample *t* test. The finding was statistically significant ($p < .001$). The incidence of CAUTI was followed, and the outcomes indicated that the overall incidence of CAUTI in these patients was decreased. The education program was effective in improving critical care unit nurses' knowledge of evidence-based practices to prevent CAUTIs. Improving nurses' knowledge to decrease CAUTI rates is a strategy that may be effective in many healthcare settings. This educational intervention may create social change by improving the health of patients and serving as an educational resource for nurses.

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Dedication

I dedicate this page of my capstone project to God Almighty; without His mercy, I would not be where I am today. Also, to my husband, Dr. Sunday Olatunji; through much sacrifice, he has made me who I am. I am indebted to him till life eternal. I love you and look forward to renewing my love with you in the world beyond. Thank you for being there for me anytime. One love will continue to keep us together. You are the best among the rest! Finally, I want to thank my children, Michael, Abigail, and Olusegun; during my struggles, they endured days of scarce attention. I love you all, team!

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Section 1: Introduction

Introduction

Healthcare-associated infections (HAIs) are a menace to patient safety (Centers for Disease Control and Prevention [CDC], 2017). Foley catheter urinary tract infections (CAUTIs) are serious HAIs that patients acquire while receiving treatment for medical or surgical conditions; CAUTIs are often considered preventable. CAUTIs are the most frequently reported hospital-acquired condition, with more than 560,000 patients developing a CAUTI every year. These infections prolong hospital stays, increase health care charges, and may result in patient morbidity and mortality (DiGiulio, 2015). The ANA CAUTI tool is designed to prevent injury and save lives; it integrates best practices based on CDC guidelines. With education, nurses are empowered with the knowledge to identify when indwelling urinary catheters (IUCs) are not clinically indicated. Training nurses to use the protocol to insert catheters when clinically indicated and manage those catheters would prevent CAUTIs. Reduced CAUTI rates would have a positive influence in reducing mortality and morbidity from HAIs (Mehta et al., 2014).

Problem Statement

The critical care unit (CCU) involved in this project was having problems with catheter-associated infections. The unit currently uses an innovative, streamlined, evidence-based clinical tool developed by the American Nurses Association (ANA, 2018) to aid in reducing CAUTIs. The ANA's CAUTI tool is a prevention tool; nevertheless, infections continue to occur, with no sign of decline in the past 2 years. The ANA tool was based on a set of rules used to ensure that catheters are not placed in the

patient unnecessarily and are removed as soon as possible. It is an evidence-based tool with proven effectiveness in the prevention of CAUTI in the following areas: inappropriate short-term catheter use, nurse-driven, on-time removal of urinary catheters, and urinary catheter care during placement (National Patient Safety Foundation, 2015).

In 2016 and 2017, the unit's rate of CAUTIs had been consistently below the national benchmark for a CCU. From 2016 to 2017, the CAUTI rate was consistently below the benchmark. Specifically, a rate of 5.7% was recorded for the entire hospital, with a rate of 2.7% for the CCU alone (Adam, 2016), However, according to my discussion with the preceptor at the practicum site, efforts at the site to prevent CAUTI had not met the minimum national and statewide standard to lower risk, save lives, and reduce costs, resulting in the unit performing below the benchmark for CAUTI rates.

The result from my practicum site was not in compliance with the Joint Commission on Accreditation, Health Care, and Certification (also referred to as The Joint Commission), which approved a new National Patient Safety Goal for 2012 related to CAUTI prevention in hospitals. The goal required the implementation of evidence-based practices to prevent CAUTI. Parida and Mishra (2013) stated that evidence-based training could meaningfully reduce the occurrence of indwelling catheterization, as well as the incidence of CAUTIs. This project is significant because incorporating staff educational programs can offer standardized practice guidelines for nurses and improve their knowledge to reduce CAUTI among patients.

Purpose

Presently, there is a gap in practice related to knowledge about CAUTI; specifically, critical care nurses' knowledge about CAUTI incidence has been found to be poor (Adam, 2016). Careful implementation of an education program for critical care nurses can result in better patient outcomes. Educating nurses through evidence-based guidelines that include the proper insertion, maintenance, and removal of a Foley catheter can decrease CAUTI rates and improve patient outcomes (CDC, 2015). The practice question was the following: Will a teach-back educational program improve the CCU nurses' knowledge of evidence-based practices in preventing CAUTIs?

The purpose of this project was to develop an education program for critical care nurses on preventing CAUTIs, thereby reducing CAUTIs in critical care patients. The project promoted effective prevention and management strategies for CAUTIs in critical care patients, thus decreasing lengths of stay in the hospital and improving quality of life. By reducing infections in patients, this project could allow CCUs to meet the goals for HAI reduction established by the U.S. Department of Health and Human Services (see Gillespie et al., 2015). The critical steps were to prevent Foley catheter-related infections in patients admitted to the critical care area and to increase critical care nurses' knowledge and compliance with hospital protocols and CDC recommendations. Foley catheters should be used only for medically required indications and be removed once they are no longer needed (CDC, 2017).

Nature of the Doctoral Project

An education program was developed based on the CDC's (2016) evidence-based guiding principles for CAUTI prevention using the ANA CAUTI tool kit. Health care facilities have an important role in preventing CAUTI. Consistency in educational programs for the CCU nurses that includes the latest guidelines, regular surveillance, interpretation of the data, and modifying the policies offer the best care to patients. Hospital infection control programs need to be developed and implemented to monitor the use of the catheters along with the proper education for healthcare staff and dissemination of knowledge. The educational program followed the *DNP Manual for Staff Education* from Walden University. Deidentified data from the hospital were obtained to identify the of CAUTIs in the CCU, and the quality assurance department provided data on CAUTI incidence in the CCU. The education program was conducted using the teach-back method.

Significance

The project may influence patient satisfaction, patient outcomes, unit effectiveness, and operational empowerment. The results of the research can be applied to units and floors other than the CCU area. Other hospitals and health care sites within the acute and long-term area of the health system can use the project's result to prevent CAUTI. Additionally, careful application of preventive measures can lead to better patient outcomes; therefore, abiding by evidence-based protocols can meaningfully reduce the occurrence of indwelling catheterization, as well as the rate of hospital-acquired CAUTIs (Parida & Mishra, 2013). Preventing healthcare-related infection in

general and in CAUTIs specifically has arisen as a priority in the United States, with government agencies taking a primary role in this effort. CAUTI was the first hospital-acquired problem selected by the Centers for Medicare and Medicaid Services in 2008 as the footing for denial of additional payment to hospitals (Saint et al., 2016).

Summary

In this chapter, I highlighted the nature of the DNP project, identified the gap that existed to support such a project, and described the purpose of the research project. The chapter included discussion of the significance of the research to nursing practice and its possible social impact. Educating nurses on techniques to prevent CAUTIs in patients admitted to critical care departments may meaningfully decrease the rate of CAUTI and the duration of catheterization (see Seyhan & Özbaş, 2017). In the next chapter, I present the theoretical framework, including concepts and models related to Knowles's (1970/1996, 1980, 1982) adult learning theory; local background and context; the project's relevance to nursing practice; toolkits for the education program; and the evaluation method.

Section 2: Background and Context

Introduction

Today, CAUTI remains one of the primary causes of nosocomial infections in the United States (CDC, 2016). Despite increasingly aggressive efforts to reduce the prevalence of CAUTIs, current estimates indicate that as many as half of all hospitalized patients receiving indwelling catheters do not have the corresponding documentation concerning the application of evidence-based criteria for this clinical decision (Weldon, 2013). The registered nurses (RNs) in the project's CCU were unfamiliar with using evidence-based bundles to guide their practices, primarily in the care of patients who have an indwelling catheter. The unit's rate of CAUTIs was consistently above the national benchmark for a CCU.

The most recent guidelines from the Healthcare Infection Control Practices Advisory Committee stressed the need for infection prevention by limiting both the use of catheters wherever possible as well as the duration of use to decrease the number of nosocomial urinary tract infections (UTIs; Welden, 2013). Likewise, the CDC (2018) emphasized the need for improved use of indwelling catheters and estimated that acute-care hospitals experienced 93,000 UTIs in 2011 alone. Therefore, the purpose of this project was to develop an education program for critical care nurses on preventing CAUTIs, thereby reducing CAUTI rates in critical care patients.

UTIs have been found responsible for more than 12% of all types of infections at acute-care hospitals, and almost all of these infections are from indwelling catheters (CDC, 2018). These alarming rates are troubling, given the frequency of indwelling

catheter use in various acute-care settings today; moreover, an estimated 12% to 16% of adult inpatients will have an indwelling catheter during their hospital stays. These devices increase the risk of CAUTI by 3% to 7% (CDC, 2018).

The American population is aging rapidly (Mather, 2016); therefore, it is reasonable to posit that these rates will continue to worsen unless measures are taken to improve how RNs are educated. There is a need for improved nurse education on evidence-based guidelines for indwelling catheter insertion and maintenance. The practice focus question was the following: Will a teach-back educational program improve the CCU nurses' knowledge of evidence-based practices in preventing CAUTIs?

Concepts, Models, and Theories

The conceptual framework used to guide this project was Malcolm Knowles's (1970/1996, 1980, 1982) adult learning theory. As originally expounded by Knowles (1970/1996), *andragogy* (i.e., the methods used for teaching adults) is based on several key assumptions concerning the characteristics of adult learners as they mature that differ from assumptions about traditional pedagogy and child learners. From childhood to adulthood, individuals' self-concept moves from one of being a dependent personality toward one of being a self-directing human being. Knowles (1970/1996), andragogy assumptions are as follows:

- They accumulate a growing reservoir of experience that becomes an increasing resource for learning.
- Their readiness to learn becomes oriented increasingly to the developmental tasks of their social roles.

- Their time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly, their orientation toward learning shifts from one of subject-centeredness to one of problem-centeredness. (Knowles, 1970/1996, p. 55)

Knowles (1980) subsequently developed this theoretical model based on four fundamental assumptions concerning how adults tend to learn and how they develop as a result:

1. The concept of learner: Their self-concept moves from one of being a dependent person to one who is self-directed;
2. The role of learners' experience: As individuals grow, they accumulate a reservoir of experience that becomes an increasingly rich resource for learning;
3. A readiness to learn: Learners see education as a process for developing increased competence to achieve their full potential in life.
4. Orientation to learning: As real-life problems occur, some learning situations require immediate attention.

In addition to fostering an organizational culture that places a high priority on achieving optimal clinical outcomes using evidence-based strategies (Trevellini, 2015), nurse educators must ensure that the manner in which they approach the staff education process remains consistent with the basic tenets of andragogy described by Knowles (1970/1996, 1980).

Based on the four fundamental assumptions listed previously, Knowles (1980) subsequently recommended that adult educators seek to achieve the following for optimal learning opportunities:

- Set a supportive climate for learning in the classroom.
- Assess learners' specific needs and interests.
- Develop learning objectives based on the learners' needs, interests, and skill levels.
- Design sequential activities to achieve objectives.
- Work collaboratively with learners to select methods, materials, and resources for instruction.
- Evaluate the quality of the learning experience and make adjustments, as needed, while assessing needs for further learning (Corley, 2011).

Table 1 indicates the relationship between adult learning theory and this project.

Table 1

Relationship of Theory and Project Framework

Adult learning theory	Relationship to the education program
The concept of learner: The learner's self-concept moves from that of a dependent person to that of a person who is self-directed.	Taking part in the education program will enable the CCU nurses to use the materials on their own as relevant for their unit.
Role of learners' experience: As individuals grow, they accumulate a reservoir of experience that becomes an increasingly rich resource for learning.	The individual experience of the critical care unit.
Readiness to learn: Learners see education as a process for developing increased competence to achieve their full potential in life.	Explore the responsibility of CCU nurses in the role of CAUTI prevention.
Orientation to learning: As real-life problems occur, some learning situations require immediate attention.	Recognize the urgency of the education nurse to prevent CAUTI on the CCU.
Learning motivation: The inner mind changes to learn.	Inspiration to prevent CAUTI on the individual unit.

Note. Adapted from *Theoretical Basis for Nursing* (4th ed., p. 20), by M. McEwen and E. Wills, 2014, Philadelphia, PA: Wolters Kluwer Health. Copyright 2014 by Wolters Kluwer Health.

Model for Evaluation

The educational intervention was conducted over a period of 2 months. During a preintervention phase, the CCU's CAUTI occurrence rates were determined. These data were compared with the occurrence rates during the postintervention phase. The compliance of CCU staff with urinary catheter bundle elements was measured during both the pre- and postintervention phases. The ANA CAUTI prevention bundle comprised an assessment of catheter need, hand hygiene, use of disposable gloves, cleansing of urethral meatus before catheter insertion by means of antiseptic saline, aseptic urine sampling method, and correct catheter bag positioning. The study was

performed in two phases; the first phase was the educational program provided to the CCU nurses, and the second phase was the posteducational phase to evaluate the effect of the intervention (Amine, Helal, & Bakr, 2014).

Relevance to Nursing Practice

CAUTIs are relevant to nursing practice because efforts to prevent CAUTIs by nursing staff can result in positive patient outcomes. The CDC (2018) emphasized that CAUTIs can result in a wide array of complications for hospitalized patients, including prostatitis, epididymitis, and orchitis in males; and cystitis, pyelonephritis, gram-negative bacteremia, endocarditis, vertebral osteomyelitis, septic arthritis, endophthalmitis, and meningitis. These complications can translate into elevated patient discomfort, longer hospitalizations, and higher mortality rates. The CDC estimated that in excess of 13,000 deaths are related to UTIs each year. Overall, greater focus should be placed on identifying optimal approaches to educating registered acute care nurses concerning these issues as well as current evidence-based approaches to indwelling catheter use.

Relevance to Nurses

RNs practicing in acute care settings are on the front lines in preventing CAUTIs, but their effectiveness in achieving improved clinical outcomes is frequently hampered by limited organizational resources, a suboptimal organizational culture, and a lack of knowledge concerning current evidence-based indications for urinary catheter insertion and maintenance (Smith, 2015). Gelinas (2015) concluded that RNs could play a major role in minimizing CAUTI incidence rates to help prevent harm and save lives; thus, they should focus on CAUTI reduction and prevention.

Given the high incidence rates for CAUTI and the potential of these infections to cause increased lengths of stay, patient discomfort, associated complications, and even death, more focus should be placed on helping critical care nurses become more proficient in preventing CAUTIs using evidence-based guidelines (Smith, 2015, p. 6). In this regard, Smith (2015) emphasized that nurses at all level of care could influence persistent results. By concentrating on evidence-based prevention systems and advancing a culture of security and responsibility, nurses may be able to reduce urinary-catheter problems (Smith, 2015, p. 46). Fortunately, some current evidence-based guidelines are available for this purpose, including the national initiatives discussed further in the following section.

National Initiatives to Address and Prevent CAUTIs

Current national initiatives concerning indications for urinary catheter insertion and maintenance to reduce the incidence of CAUTIs include guidelines from the Healthcare Infection Control Practices Advisory Committee (HICPAC) as well as the Association for Professionals in Infection Control and Epidemiology (Smith, 2015). A summary of the most recent recommendations from the HICPAC concerning appropriate indications for indwelling catheter use is presented in Appendix C. In addition, guidelines from the Association of Professionals in Infection Control include recommendations for proper techniques for urinary catheter maintenance that can be used for nursing staff education purposes, as described in the following section.

Staff Education

Three methods can improve evidence-based clinical care to reduce the frequency of CAUTI: (a) urinary catheter care during insertion, (b) prevention of inappropriate short-term catheter use, and (c) nurse-driven appropriate removal of urinary catheters. At present, quality and performance improvement initiatives are driving significant changes in the U.S. health care system (Smith, 2015). In this regard, Ileno and Wideman (2013) emphasized that currently, health care costs and efficiencies in patient care delivery have featured the significance of utilizing the best proof dependent on nursing to enhance quality results and the budgetary status of hospital-based organizations (p. 194). These trends have shown the importance of educating nursing staff members concerning the most recent evidence-based practice guidelines for indwelling catheter insertion and maintenance. Consequently, critical care nursing educators face the need to identify the most appropriate methods for helping their professional nursing staff gain the knowledge they need concerning best evidence-based practices in those areas where they can make the most difference, including reducing the rate of nosocomial infections in general and CAUTIs in particular.

In summary, educating nursing staff on best evidence-based practices concerning CAUTI prevention represents a timely and valuable practice for nursing educators in all acute-care settings. One such evidence-based tool kit for preventing CAUTIs has been developed by the ANA. The CAUTI prevention tool kit was developed through a collaborative effort between representatives from the CDC, ANA, American Geriatrics Society; Association of Perioperative Registered Nurses; American Hospital Association;

and the Wound, Ostomy, and Continence Nurses Society (Gelinas, 2015). The algorithm used by the CAUTI prevention tool kit has four overarching objectives, as follows:

- Prevention of CAUTI.
- Placement of fewer IUCs.
- More timely removal of IUCs per CDC guidelines.
- Consistent, timely, evidence-based nursing assessments and interventions for adequate bladder emptying. (ANA, 2018, p. 1).

The tool kit begins with the diagnostic criteria set forth by the CDC's HICPAC for CAUTIs. For acute urinary retention (sudden and painful inability to urinate or bladder outlet obstruction), the following diagnostic criteria set forth by the CDC's HICPAC for CAUTIs are followed:

- To improve comfort for end-of-life care if needed.
- Critically ill and need for accurate measurements of input and output (e.g., hourly monitoring).
- Selected surgical procedures (genitourinary [GU] surgery/colorectal surgery).
- To assist in healing open sacral or perineal wound in the incontinent patient.
- Need for intraoperative monitoring of urinary output during surgery, or large volumes of fluid or diuretics anticipated.
- Prolonged immobilization (potentially unstable thoracic or lumbar spine, multiple traumatic injuries such as pelvic fractures; ANA, 2018, p. 1).

If patients satisfy any of the foregoing criteria, the ANA's CAUTI prevention tool kit's algorithm in Figure 1 becomes applicable.

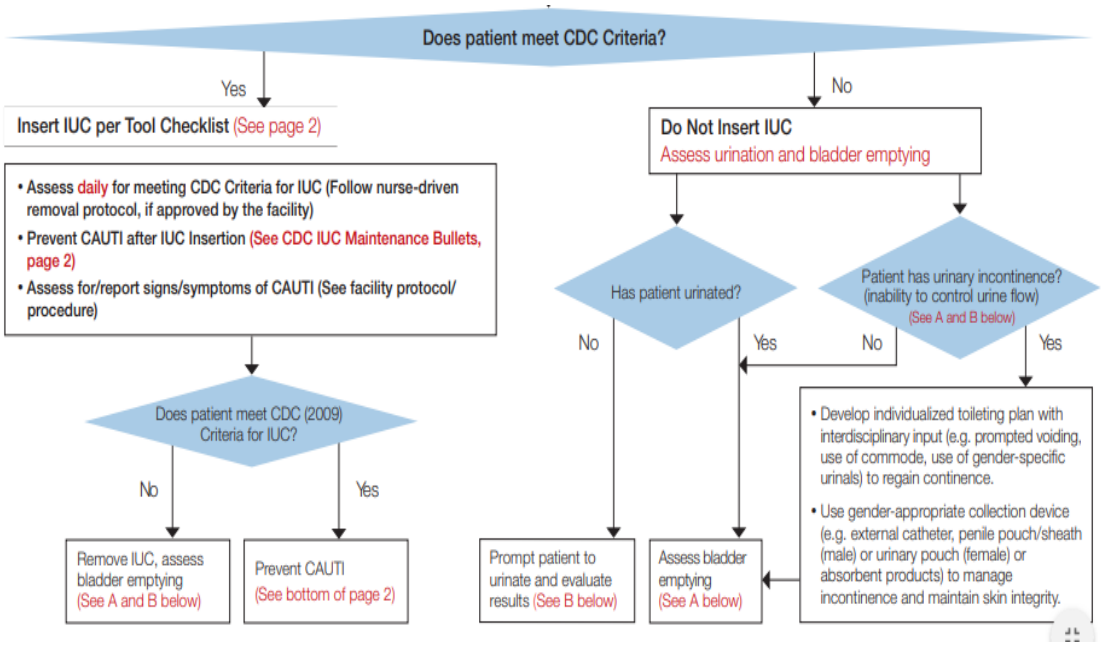

Figure 1. ANA's CAUTI prevention tool kit algorithm for identifying patients at risk of developing CAUTIs. Adapted from "Catheter-Associated Urinary Tract Infection (CAUTI)," by American Nurses Association, 2018 (http://www.nursingworld.org/MainMenuCategories/WorkplaceSafety/Healthy-Work-Environment/ANA-APIC/Healthcare-Associated-Infections/Catheter-Urinary-Tract-Infection.html). In the public domain.

Assessment for the adequacy of bladder emptying pursuant to the aforementioned algorithm is set forth; for example, if the patient has urinated (voided) within 4 to 6 hours, the following guidelines apply:

- If minimum urinated volume ≤ 180 ml in 4 to 6 hours or urinary incontinence present, confirm bladder emptying. Prompt patient to urinate/check for spontaneous urination within 2 hours if postvoid residual (PVR) < 300 to 500 ml.
- Recheck PVR within 2 hours.
- Perform straight catheterization for PVR per scan ≥ 300 to 500 ml.

- A repeat scan within 4 to 6 hours and determines the need for straight catheterization.
- Report to the provider if retention persists ≥ 300 to 500 ml.
- Perform ongoing straight catheterization per facility protocol to prevent bladder overdistension and renal dysfunction, usually every 4 to 6 hours.
- If urinated >180 ml in 4 to 6 hours (adequate bladder emptying), use individual plan to promote/maintain normal urination pattern.

If the patient *has not* urinated within 4 to 6 hours and/or complains of bladder fullness, then determine the presence of incomplete bladder emptying and do the following:

- Prompt patient to urinate. If urination volume ≤ 180 ml, perform a bladder scan.
- Perform a bladder scan to determine PVR. If no scanner available, perform straight catheterization (Streamlined evidence-based RN tool kit for catheter associated urinary tract infection prevention, ANA, 2015, p. 2).
- The streamlined evidence-based RN tool kit for CAUTI prevention also includes a comprehensive checklist for inpatients, which is depicted at Appendix A. Although the ANA's CAUTI prevention tool kit represents a valuable resource for RNs in general and those practicing in acute care settings in particular, there remains the need to identify optimal strategies to educating them concerning these protocols, a need that directly relates to goals of studies such as this one.

Conclusion

Catheter-associated urinary tracts infections have remained relevant to nursing practice because the CDC (2018) emphasized that CAUTIs could result in a wide array of complications for hospitalized patients, including prostatitis, epididymitis, and orchitis in males; and cystitis, pyelonephritis, gram-negative bacteremia, endocarditis, vertebral osteomyelitis, septic arthritis, endophthalmitis, and meningitis. These complications translate into elevated patient discomfort, longer hospitalizations, as well as higher mortality rates. The CDC estimated in excess of 13,000 deaths were related to UTIs each year. In summary, more focus should be placed on identifying optimal approaches to educate registered acute care nurses concerning these issues as well as current evidence-based approaches to indwelling catheter use.

Local Background and Context

The focus patient care areas for this EBP project are the critical care units at a metropolitan, verified Level I trauma center hospital. The hospital manages 33 inpatients units and has approximately 953-beds with six medical CCU units. Over the years, the health system has maintained its legacy and commitment to the underserved of two counties, while providing care for residents of the entire metro area. The hospital organization leaders wanted to reduce CAUTIs to improve quality outcomes and lower costs. Evidence-based practice guidelines by CDC are available to inform prevention activities that will lead to CAUTIs reduction. However, ensuring adherence with the guiding principle is challenging in this complex healthcare environment. Safety and quality programs in the health system are a direct collaboration of the healthcare team.

Members of the team comprise urologists, physicians, registered nurses, infection prevention staff, quality improvement experts, and laboratory staff and the patients.

By engaging clinical and quality staff for compliance with CAUTI prevention best practices, the CCU has recorded some sustainable improvements. However, CAUTI is a *never event* among hospitalized patient (Waters et al., 2015). Despite the identification as a never event and the dire measure by Medicare to stop reimbursement on complications associated with CAUTI, these issues continue to occur far too often in the CCU.

Prior prevention activities have focused exclusively on the CAUTI rate and on the causes of infection rates, such as insertion or management of the indwelling urinary catheter; however, none has utilized the teach back method, as in this research. The hospital has historically experienced CAUTI rates higher compared to current national averages. From 2016 to 2017, the CAUTI rate was consistently below the benchmark, with 5.7% was recorded for the entire hospital, and 2.7% for CCU alone (Adam, 2016, p. 15). The organization is recognized as a Nurse Magnet hospital based on American Nurses Credential Center designation as of January 2, 2018; through its clinical excellence, pioneering research, and progressive medical training, it was named in 2017 as the Most Wired Hospitals using technology to partner with patients on health (U.S. News and World Report, 2017).

Role of the DNP Student

The project was in my practicum organization. The hospital organization was responsible for the supervision and approving the project implementation. Initial

communication with the critical care director and the leadership in the CCU influenced my decision to implement this evidence-based project. Following the CCU Quality Improvement board progress report during my field experience, I found there existed an institutional need to reduce their CAUTI rates. I spearheaded the project and the development of the CAUTI education tool kit; following the CDC guidelines, I implemented the project and evaluated the project after completion.

Being a critical care nurse for 6 years, and the champion nurse for the prevention of CAUTI for 2 years, my desire grew to conduct this DNP project. In those 2 years, the CCU CAUTI level was reduced related to the combined effort of the CAUTI team, but the problem CAUTI still occurred. LaVeck (2017) stated that as a research-focused professional, prospective DNP student were well situated to assume leadership roles in developing educational strategies to provide nursing staff members with the information and tools they would need to reduce CAUTIs in their health care facilities.

Role of the Project Team

The selected site for the DNP project was a hospital facility and a Number I trauma hospital in the metro area of the state. This site would serve the purpose of a collaborative unit because all disciplines had to work together to care for the patients in the facility to prevent hospital-acquired infections, thereby ensuring successful patient outcomes. One of the main goals of the hospital team is to decrease or entirely eradicate CAUTI among the inpatient admitted to the CCU (see Parida & Mishra, 2013).

Kettner, Moroney, and Martin (2015) stated direct stakeholders were the frontline committee for the protocol project. The stakeholders involved in the project included the

hospital chief nursing officer (CNO), CCU director, the infection control department, the hospital advance educators, and the clinical managers. Other core stakeholders (apart from the management at the facility) included the CCU nurses, the physicians, and other ancillary services. The admitted patients in the CCU unit were also stakeholders as they had direct contributions and voices in their own care. External stakeholders included family members affected with CAUTI and members of the entire community. Collaboration is the essence of success, and all stakeholders and disciplines must work together to promote a successful project outcome (National Institute of Building Sciences, 2017).

The project site managed 33 inpatients units and had approximately 953-beds with six medical CCU units. The CNO and CCU director of nursing would assist by facilitating all meetings pertaining to the facility protocol. The hospital educator usually played a huge role in directing and facilitating nurses, patients, and family education. Mostly, physicians would order Foley catheter and had to be familiar with the indication of catheterization. The nurses would play a critical role in CAUTI prevention because they conducted the initial assessment, insertion, and overall management of indwelling catheter. Educating nurses on techniques to prevent CAUTIs in patients admitted to critical care would meaningfully decrease the rate of CAUTI and the duration of catheterization (see Seyhan & Özbaş, 2017). Stakeholders should communicate regularly among each other for project executions to become successful (Kettner et al., 2015, p. 127). Team members could meet through emails, planned meeting times, and conference calls.

Summary

In this chapter, research was consistent in showing that despite increasingly aggressive efforts to address the problem, CAUTIs had remained a persistent source of nosocomial infections in the United States today. Although national initiatives are underway that have developed evidence-based guidelines available concerning indwelling catheter use and maintenance, far too many RNs remain uneducated concerning these protocols, and an ongoing need exists to ensure all staff members fully understand and appreciate the need for these strategies. Part of the problem is the decision to use an indwelling catheter in the first place.

The research has shown most patients receiving indwelling catheters have lacked documentation that reflects an evidence-based decision to place it in the first place, indicating the viable alternatives described in Table 1 and evidence-based practices set forth in Table 2 are not being taken into consideration. These trends have shown the importance of studies such as this one in improving nursing in acute care settings, and nurse educators are well situated to address this need directly. Section 3 describes the planning, implementation, and evaluation of this project following the *DNP Manual for Staff Education*.

Section 3: Collection and Analysis of Evidence

Introduction

Despite significant efforts to address the problem, CAUTIs continue to represent one of the main sources of HAI in the United States today. The most recent estimates have shown that as many as 50% of all inpatients who receive indwelling catheters do not satisfy the evidence-based criteria for this clinical decision (Brailas et al., 2017). The most recent guidelines from the HICPAC have shown the need for improved training strategies to restrict the use of catheters to the maximum extent possible, as well as how long indwelling catheters are allowed to remain in place, in an effort to decrease the prevalence of nosocomial UTIs (Welden, 2013). The practice-focused question used to guide this project is outlined in this chapter, followed by a description of the sources of evidence used to develop timely and informed answers for the question. Additionally, a description of the analytical strategies used to synthesize data is followed by a summary of the chapter's content and key findings, which conclude this chapter.

Practice-Focused Question

The rate of CAUTIs at the CCU for which I developed this project had been consistently above the national benchmark, and past efforts to prevent CAUTIs had not met the minimum national and statewide standard to lower risks, save lives, and reduce costs. RNs practicing in acute care settings are on the front lines in the effort to prevent CAUTIs because they maintain urinary catheters; thus, they can implement recommended policies to prevent CAUTIs and improve patient outcomes (Smith, 2015). The purpose of this project was to develop an educational program for critical care nurses

on preventing CAUTIs, thereby reducing CAUTIs in critical care. The practice-focused question was the following: Will a teach-back educational program improve the CCU nurses' knowledge of evidence-based practices in preventing CAUTIs?

Sources of Evidence

According to the functional data, this facility performs below average in CAUTI prevention in the state of Georgia. The national benchmark for CAUTI is < 1.00 per 1,000 patient days. Among the 75 hospitals in Georgia with adequate data to calculate standardized infection ratio (SIR), 11% of Georgia hospitals had SIR significantly higher (worse) than 0.93, the value of the national SIR (CDC, 2016). The priority for the CCU and the hospital organization was to decrease CAUTI rates to or below the state and national level. Deidentified data given to me by the facility's infection control department and quality assurance coordinator showed that in 2018, on critical units, there were 11 cases of CAUTI (Appendix C). The CAUTI Audit Tool report located in the iPad provided by the CCU clinical specialist educator showed that caregiver education needed improvement in the area of assessment and general knowledge for CAUTI care and management.

Participants

Nurses are cornerstones in efforts to reduce CAUTI in hospitals, mainly because nurses' assessment, screening, and evidence-based management of urinary retention and incontinence are essential to reduce catheter overuse (Lo et al., 2014). Full- and part-time CCU RNs were invited to participate in this education session.

Procedures

Commitment from the CCU director and quality improvement board for the project was obtained during the field experience. During the field experience, interviews with staff indicated that staff needed more knowledge and continuous education to prevent CAUTI effectively. The learning objectives and course content were developed based on the evidence and best practices from Section 2 (Appendix A). Upon Institutional Review Board (IRB) approval, a DNP-prepared nurse staff educator served as a content expert and reviewed the learning objectives and education materials. Based on her input, changes were made to the final learning objectives and education program recommendations.

Protections

Approval for implementation of this staff education project was obtained from the IRB at Walden University (IRB # 03-26-19-0744925). Approval to carry out the project at this site was granted by the institutional authority, who completed and signed the site approval documentation form for staff education doctoral projects. Participants were provided the consent form for anonymous questionnaires before participation in the education session. Both documents were found in the Walden University *Staff Education Manual*.

Implementation and Evaluation

Email addresses of CCU RNs were provided to me by the facility. I emailed them an invitation to participate in a variety of sessions on CAUTI, with 3 days and 3 nights sessions available. Reminder emails were sent 24 to 48 hours before each session. The

education program was presented in the unit meeting/huddle room. Thirty-five-minute group training sessions describing indicators for catheters and demonstrating the proper insertion and maintenance techniques used the ANA's Streamlined Evidence-Based RN Tool: Catheter-Associated Urinary Tract Infection Checklist. Each participant did a teach-back with another participant or me. Each participant did a return demonstration with the teach-back method using the CAUTI Prevention Competency Check-Off List.

Teach-Back Method

Studies have shown that 40% to 80% of the information that nurses receive during educational sessions is forgotten immediately, and nearly half of the information retained is incorrect (Agency for Healthcare Research and Quality, n.d.). The teach-back method has been shown to improve knowledge retention (Bahri, Saljooghi, Noghabi, & Moshki, 2018). Participants completed an anonymous evaluation of the program (Encoded CAUTI Prevention Competency Checklist, Encoded Pre, and Posteducation Questionnaire). Participants placed their completed evaluations in an envelope.

Table 2

The Teach-Back Method Evaluation Steps

Choice	Correct?
Can you explain some of the reason why a patient should have a Foley catheter inserted? I want to make sure that I was clear and that you have the best outcomes.	Yes
Demonstrate how to insert a Foley catheter device correctly?	RN is able to demonstrate.
On a scale of 0-5 where 0 is *no knowledge* and 5 is *very knowledgeable*, determine if the teach-back method of training has improved your knowledge of CAUTI prevention.	5
Can you explain to me what maintenance steps are needed when your patients have Foley catheter?	Yes
In your own words, just to be safe, what are some possible signs of a catheter that needs to be cleaned?	RN should be able to list three reasons.
How confident are you in caring for IUC in patients? Not confident, or very confident?	Very confident
Do you have any questions?	No

Analysis and Synthesis

Results of the program evaluation were tabulated using descriptive statistics to determine if the teach-back method of training was effective in educating registered nurses concerning optimal catheterization and maintenance procedures. It was anticipated that critical care nurses who participated in the training (training session followed by experiential opportunities using a training model prior to application to real-world patients) would achieve superior outcomes (see Brailas et al., 2017).

Results were shared with the CCU nurses and the staff development and quality control departments of the institution. Data on CAUTI rates for 1 month were provided by the quality assurance department posteducation program. Pre and post data for a 1-month interval before and after the program were compared. This result was consistent

with the findings of a study by Brailas et al. (2017) concerning the respective effectiveness of experiential learning opportunities. Experience has been shown to be a critical part of the learning experience, where learning results from directly experiencing something for oneself (see Brailas et al., 2017). In other words, people tend to best "learn by doing" and teaching back; this tenet is applicable to CAUTI prevention training as well. These observations are also congruent with the tenets of Knowles's (1970/1996, 1980, 1982) adult learning frameworks and reinforce the centrality of including as many experiential learning opportunities as possible to facilitate knowledge acquisition.

A synthesis of the data that result from the delivery of the training approach was used to assign the appropriate skill acquisition levels for these procedures. Results obtained from data were provided to the quality assurance coordinator, and gaps identified in the education process were reviewed and reported to the quality assurance controller. Recommendations for further education and process changes were processed at this time. Unfortunately, this training initiative was costly. The transparent catheter training models would have cost me $3,500 each, but for the timely intervention of the CCU, the clinical specialist educator supplied the lead materials free of charge for the training. These costs were justified by the additional effectiveness of the training approach provided. Therefore, the results of this study can be used to determine whether the addition of experiential training opportunities using training models is justified by its increased effectiveness compared to training strategies that do not use these models. In the event that the full expectations of the respective effectiveness of the training approach

are realized, these findings can be shared with similarly situated healthcare organizations, and the male and female training models may be shared on a rotating basis.

Summary

CAUTIs are preventable acquired infections, and through education and experience, nurses play a critical role in effectively influencing their prevention (Gelinas, 2015, p. 6). This section provided a detailed analysis of the education program provided to nurses to accomplish the goal of CAUTI prevention. The comprehensive design of the project, its implementation, and the evaluation plan, together with procedures, protections, and participants, were addressed. Section 4 is concentrated on findings and further recommendations.

Section 4: Findings and Recommendations

Introduction

Patients may acquire CAUTI while receiving treatment for medical or surgical conditions. CAUTIs result in prolonged hospital stays, increased health care charges, and (in some cases) morbidity and mortality (DiGiulio, 2015). CAUTIs are the most frequently reported hospital-acquired conditions, affecting more than 560,000 patients annually. Currently, there is a protocol that integrates best practices based on CDC (2018) guidelines to help prevent CAUTIs, and proper training in the use of this protocol can reduce mortality and morbidity related to CAUTIs. Likewise, a new National Patient Safety Goal for 2012 was approved by The Joint Commission in relation to CAUTI prevention in hospitals.

In the particular CCU where this study was conducted, the ANA CAUTI prevention tool was being used but infections had continued to occur, and CAUTI rates had shown no sign of decline in the past 2 years. The ANA CAUTI is an evidence-based tool that has proven effective in preventing CAUTIs due to inappropriate short-term catheter use and in emphasizing the importance of nurse-driven, on-time removal of urinary catheters and urinary catheter care during placement. However, despite the usage of the ANA CAUTI, the rate of CAUTIs at the project site was consistently above the national benchmark for a CCU. Thus, the goal of the institution was to implement evidence-based practices that could meaningfully reduce the occurrence of indwelling catheterization while preventing the incidence of CAUTIs. I expected that by

incorporating staff educational programs, practice guidelines would be standardized, and staff knowledge would be improved to reduce and/or prevent CAUTIs among patients.

In line with this goal, the purpose of this project was to develop an education program for critical care nurses on preventing CAUTIs. I designed this project to respond to the practice question of whether a teach-back educational program would improve CCU nurses' knowledge of evidence-based practices in preventing CAUTIs. CCU nurses were invited to participate in a series of education and training sessions on CAUTI. Participants were then asked to perform teach-back activities with either other participants or me. A pretest and a posttest were administered before and after the education sessions, and the results from each evaluation were used as the basis to determine whether the education program was effective in improving CCU nurses' knowledge of evidence-based practices in preventing CAUTIs. A paired-samples *t* test was conducted to determine whether the differences between the pretest and posttest scores were statistically significant. This section contains the results of the data analysis conducted.

Findings and Implications

A total of 32 CCU nurses participated in the project. Demographic data were collected from these 32 participants, and the results of the frequency analysis are shown in Table 3. As shown in Table 3, out of the 32 participants, 13 were between 23 and 33 years of age (40.6%), while 14 were between 34 and 45 years of age (43.8%). The remaining five participants were between 46 and 54 years of age (15.6%). Most participants primarily spoke English (23 out of 32, 71.9%). Likewise, the largest group of

participants were of African American descent (21 out of 32, 65.6%). Thirty out of the 32 participants were female (93.8%), and the most significant number of participants had 3 to 5 years of experience working as a CCU nurse (13 out of 32, 40.6%).

Table 3

Results of Frequency Analysis

	N	%
Age range		
23-33 years old	13	40.6
34-45 years old	14	43.8
46-54 years old	5	15.6
Primary language		
English	23	71.9
Other	9	28.1
Race		
Caucasian	9	28.1
African American	21	65.6
Asian	2	6.3
Gender		
Female	30	93.8
Male	2	6.3
Years of experience		
Less than 6 months to 2 years	10	31.3
3 to 5 years	13	40.6
6 to 10 years	5	15.6
11 to 24 years	4	12.5

To address the practice question of whether a teach-back educational program would improve the CCU nurses' knowledge of evidence-based practices in preventing CAUTIs, a paired samples *t*-test was conducted to compare the pretest and posttest scores of the participants. Table 4 shows the results of the paired samples *t*-test. The average pretest score was calculated to be 44.63, while the average posttest score was calculated to be 49.52. These scores indicate a 4.89-point increase in average scores from the pretest

to the posttest. Based on the results of the paired samples *t*-test, this difference is statistically significant, t (26) = -6.710, $p < .001$. Thus, the implemented program was effective in improving CCU nurses' knowledge of evidence-based practices to prevent CAUTIs.

Table 4

Results of Paired Samples t *Test*

	Mean	Mean diff.	*t*	*df*	Sig.
Pretest	44.63	4.89	-6.710	6	.000
Posttest	49.52				

Data were collected from the CAUTI bundle audit tool for the month of May 2019, as shown in Figure 2.

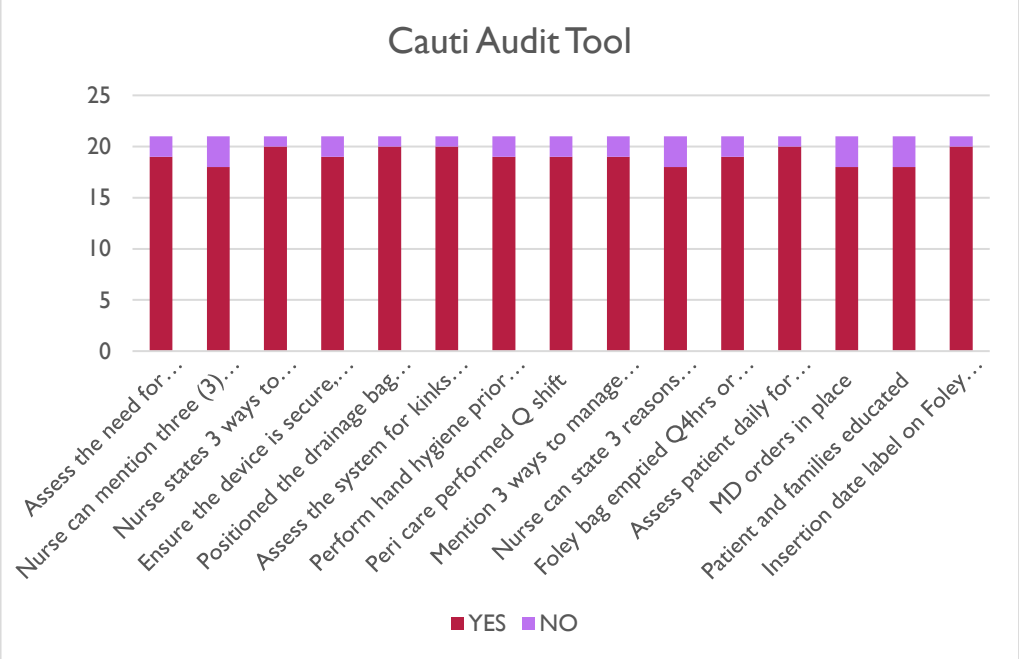

Figure 2. CAUTI audit compliance tool.

Data Collection and Analysis

Full- and part-time CCU RNs were invited to participate in the education session, and 32 RNs participated in the DNP project. The six training sessions, together with the pretest/posttest assessments, were undertaken between 04/12/2019 and 06/28/2019. Before the training days, the participating CCU RNs completed the pretraining assessments (pretest). The PowerPoint presentation was provided to the nurses for 10 mins before the training during the huddle that occurred at the change of shift for the 3 days and nights on which the training occurred. After completing the teach-back training, the participating RNs took the posttraining assessment (posttest). The results of the two assessments were compared by means of paired samples *t*-test to determine the significance of the data.

Discussion of Findings

The participating CCU RNs in this DNP project had, on average, between 3 and 5 years' CCU experience and were mostly English speaking, female, and identified as African American (65.6%). The largest age group was between 23 and 45 years of age, with only 15.6% of participants older than 45 years. The mean of the pretest results was only 44.63, which was lower than expected and desired for nurses working in a CCU environment where catheters are part of the daily routine. Repeated efforts to reduce CAUTI at the facility had met with only moderate change. Upon administering the pretest, it became evident that the CCU RNs' knowledge base on catheter management was not enough, which was confirmed earlier during the field experience as the staff

indicated that they needed more knowledge and ongoing education to prevent CAUTI effectively.

The posttest data were collected after presenting the 35-minute group training sessions on indicators for catheters and the proper insertion and maintenance techniques using the ANA's Streamlined Evidence-Based RN Tool: Catheter-Associated Urinary Tract Infection Checklist. To consolidate the information and enhance retention, teach-back sessions were used in which the participants worked in pairs or used me as a partner for teach-back (Bahri et al., 2019). The paired *t*-test indicated a statistical difference, $t(26) = -6.710$, $p < .001$, between the means of the pretest (44.63) and posttest (49.53). The implemented program was effective in improving CCU nurses' knowledge of evidence-based practices to prevent CAUTIs. The expectation was that participating CCU nurses would achieve superior outcomes (see Brailas et al., 2017). Despite the significant difference between the pretest and posttest results, the posttest results were not as superior as anticipated, as the mean did not even meet 50%. This finding was concerning because successful prevention of CAUTI is dependent on nurses' knowledge and skill. As the project outcomes were positive, the practicum facility educational staff could implement regular training and refresher courses using the teach-back method.

Implications

Notwithstanding the efforts at the practicum site to prevent CAUTI, the CAUTI rate was consistently above the benchmark, with 5.7% recorded for the entire hospital and 2.7% for the CCU alone (Adam, 2016, pp. 15). Efforts to lower CAUTI rates at the research facility were focused on the goals of lowering risks, saving lives, and reducing

costs. The DNP project was successful, as the results were statistically significant in favor of the teach-back method. The posttest results, though not as superior as anticipated, were statistically significant. I anticipated that the knowledge and practical gains made by the participating nurses would make a significant and permanent difference in the overall catheter management at the CCU, as noted in the posteducation month. Other members of the staff might also benefit from the training provided, which might offer them heightened awareness of the need for effective decision making as well as placing and maintaining catheters. My sincere hope is that due to this project, infections in patients will be reduced and the CCU will be compliant with the HAI-reduction protocol enacted by the U.S. Department of Health and Human Services (see Gillespie et al., 2015).

Despite many pieces of evidence and supporting interventions to reduce or prevent UTI, CAUTI rates remain high (ANA, 2018). This project can become a model for independent nursing interventions in many acute-care hospitals with such interventions. This CAUTI prevention education program may assist policymakers in the healthcare environment in developing a protocol to encourage and increase collaboration between physicians and nurses to improve patient outcomes. The outcome of this study may assist in standardizing the process for nurses to follow to sustain compliance by improving the structure for U.S. healthcare delivery.

Recommendations

Recommendations for future research include examined in detail the project outcomes, together with the strengths and limitations of the project. Translating academic

knowledge into best practices for implementation is best done with proper planning backed by sufficient review of the literature and a suitable theoretical framework (White & Dudley-Brown, 2012). It may not be possible to identify a single cause for or solution to CAUTI due to its complex nature; nurse training and efficient execution of the protocol should be seen as part of a solution and not as the complete answer to the problem of CAUTI at this CCU facility. The results from this project help to fill the gap in practice at this CCU facility.

Based on the findings of this DNP project, it is recommended that the practicum facility continue with the teach-back training program that was introduced. Not only should the nurses in CCUs undergo this training, but also the complete nursing staff at the facility. This process will achieve a higher level of skill in the staff and acute awareness of catheter management and nosocomial UTIs (Welden, 2013). When the facility's complete nursing staff and management are all acutely aware of the CAUTI reduction program and the resulting effect of no CAUTI incidence in the posteducation month, the facility will have a greater chance of meeting the set goals. The nurses' knowledge, as assessed on the posttest, remained limited; thus, regular follow-up training is recommended to increase knowledge and skill related to catheter placement and management in the nursing staff. Additionally, researchers interested in determining whether the teach-back method can be expected to yield superior learning results can probe further. Results from the two groups can be compared against the pretest results to determine the benefit of the teach-back method.

Contribution of the Doctoral Project Team

One of the main goals of the hospital team is to decrease or entirely eradicate CAUTI among the inpatients admitted to the CCU (Parida & Mishra, 2013). The clinical specialist educator for CCU played a significant team role in this DNP project. Highly motivated to decrease CAUTI rates in the CCU, she provided the training sessions and helped to reduce costs by using resources already available to the team. She also assisted in reminding the nurses through emails of the upcoming training meant for research purposes and made a few suggestions for the CAUTI competency check-off list used for the training to capture the facility's needs. She completed this process in conjunction with my preceptor, a DNP-prepared advanced nurse staff educator at this facility; together, they reviewed the learning objectives and education materials. Based on their input, changes were made to the final learning objectives and education program.

Other project team members were the two CAUTI champion nurses who represented the CCU. These nurses assisted me by providing a list of the patients currently on the unit who had IUC, including patient days and catheter days, and acted as the resource nurse during the training sessions. As the project outcomes were positive, the clinical specialist educator for the CCU had a plan in place to implement regular training and refresher courses using the teach-back method. She stated that the nurses were more confident when reproducing and teaching back what they had learned, and this finding showed that their knowledge had been influenced. A further recommendation for the participating nurses to be made members of the "Train the Trainers" training the rest nurses during the CCU annual skills check-off was made.

Strengths and Limitations of the Project

Although there were many strengths of this project, there were also limitations. This section describes the limitations of this DNP project, as well as the beneficial outcomes that resulted.

Limitations

Although the sample size for the DNP project was sufficient, a larger sample would have been welcome; however, working with a larger sample would have been more time consuming and costly. With a small sample, it was not feasible to make generalizations; therefore, the teach-back method achieved better results in this project, and this might be the case in other settings as well. Another limitation was that the DNP project was conducted in one facility only, which limited the generalizability of results. Notably, it was impossible to determine whether it was the teach-back alone that made the difference between the pretest and posttest results. The quality improvement was limited in using the teach-back method with all participants, using a control group would be better in establishing the influence of the teach-back method.

Strengths

A strength of this quality improvement project was the availability of staff and information regarding previous CAUTI reduction efforts, which allowed for comparison after the project was implemented and maintained throughout the facility. Exploring the effectiveness of the teach-back method was an important strength of this project, as it had wide implementation possibilities. Similarly, measures for improved catheter decision making, placement, and maintenance, together with the prevention of CAUTI, could be

widely implemented, which was another strength of this project. This strength coincided with the CDC's identified need for the improved use of indwelling catheters (CDC, 2018).

Section 5: Dissemination Plan

The purpose of disseminating this project was twofold: (a) to share the outcomes of this project with key stakeholders at the hospital, first the CCU unit's director and the clinical specialist educator, and thereafter all CCU clinical managers and nursing staff; and (b) to share the successes of this project with other similar facilities. Sharing of the results was done with the objective that nursing staff in similar facilities and situations could adopt this or similar quality improvement projects through which patient care could be improved. A PowerPoint presentation was developed to convey the project results to managers, staff members, and other stakeholders at the project site. The PowerPoint presentation, including the CAUTI Prevention Check-Off List, was delivered at the facility after completing the project to disseminate the results. For further presentations and improving the quality of care, this PowerPoint would remain at the facility.

The PowerPoint presentation was used to present the results of the project to the core stakeholders of the project site. The use of Microsoft PowerPoint to present project outcomes both in written and graph format is an accepted and widely used practice in the medical field (Barton, Reichow, & Wolery, 2007; Parkin, 2016). Direct stakeholders for this project included the frontline committee, hospital CNO, CCU director, CCU clinical specialist, infection control department, hospital advance educators, and clinical managers (see Kettner et al., 2015). Apart from the management at the facility, other stakeholders included the CCU nurses, physicians, and other ancillary services. Admitted patients who had been affected with CAUTI, together with their families in the CCU unit, were also stakeholders, as they had direct contributions to and voices in their own care.

However, they were not included in the information dissemination process of this project. All stakeholders and disciplines were motivated to work together to promote a successful project outcome (see National Institute of Building Sciences, 2017).

The practicum-site facility is fairly sizable; thus, involving all stakeholders is important to disseminate the information throughout the facility. The project was aimed at the RN staff in the CCU; therefore, the staff and the clinical specialist in this unit were among the first to receive information on the project's success. After presenting the project outcomes to the core stakeholder team—consisting of the CCU nurses, clinical specialist educator for CCU, CCU director, CCU clinical manager, and quality control departments of the institution—the hospital advance education team would take responsibility to educate all nursing staff and maintain competency.

Analysis of Self

The total DNP experience was one that stretched my ability to multitask and remain focused despite different and sometimes clashing responsibilities in various spheres of my life. In the beginning, I was naïve enough to expect that meticulous planning and sticking to the mapped route would see me through, but I soon realized that working, studying, and running a full life means many unexpected situations on a near-daily basis. The DNP program taught me to remain focused on my goal and to readjust my interim plans according to participants and my environmental needs. With its holistic focus on developing advanced skills and the ability to turn theoretical knowledge and insights into practice, the DNP program served to develop my academic, practical, and leadership qualities (see Houghton, Casal, Fortuna, & Larsen, 2015; Shelton, 2016).

Special mention must be made about gaining more insight into improving the quality of care through evidence-based practice by translating academic concepts to practice, which resonated with my interests (see Shelton, 2016; Walker & Polancich, 2015). My growth as a scholar was tremendous, especially because I had the opportunity to work in tandem with my preceptor, who tirelessly assisted with my growth. I also worked with some of my old colleagues, which was a humbling experience in learning to respect human space and the respect that comes with higher education.

Through these endeavors at my practicum facility, I faced several practical learning opportunities by being afforded the chance to serve in different positions within the units, sometimes shifting my role from DNP researcher to nurse assistant, nurse, or even patient transporter. I assumed these roles when a participating nurse needed help in order to have enough time for the training, in keeping with the nature of the CCU working environment. These opportunities allowed me to extend myself, especially as a team leader, through which I gained advanced experience in working with diverse groups. Not only did I gather invaluable experience in working with different people from various interest groups, but I also learned more about myself. Partaking in the DNP program was instrumental in further developing my ability to synthesize the knowledge that I gathered throughout my studies (see Tymkow, 2014).

I am passionate about quality of care, and upon learning that my practicum organization, the CCU, was experiencing a CAUTI problem, I discussed this institutional need with the critical care director. This process is an example of how the DNP-prepared nurse can take responsibility to improve practice (see Shelton, 2016). Upon starting to

plan and arranging meetings and discussions with different stakeholders, I found that my roles and experiences in the past had prepared me to take the lead in a project such as this one.

However, I needed the support and guidance of my preceptor and the DNP lecturers who had helped me to develop my skills. Although I had been exposed to the task of training others, this project made me realize that I truly enjoy being involved in training and going the extra mile to follow through with participants, even at odd hours. The project expanded my views as an educator, specifically as it involved adult training, which calls for a distinct approach—an area that I find fascinating (see Knowles, 1970/1996, 1980). Being practice-oriented, the DNP program taught me to analyze and evaluate outcomes systematically, enabling me to develop skills needed to adjust program outcomes and obtain the best results.

The collegiality that I experienced at my practicum facility was one of the most outstanding experiences of my DNP journey. The level of care and interest in my progress as a student and as a person that I received were unparalleled; I will always carry the benefits of this attention. I experienced a great sense of caring and support as all stakeholders displayed a willingness to accommodate my needs and support me. This human element made the DNP journey even more fulfilling. I have the greatest appreciation for those who supported me throughout the DNP program and am honored to have been instrumental in changing practices in the CCU by developing a CAUTI education tool kit based on the CDC guidelines.

The project site manages 33 inpatient units and has approximately 953 beds and six medical CCU units. The health system has developed a legacy of being committed to the underserved of two counties and improving healthcare for residents of the entire metro area. As a Nurse Magnet hospital with clinical excellence, pioneering research, and progressive medical training, the project facility plays an important role as a trendsetter within the region. According to Schneider (2017), successes in the area of quality improvement should be shared with other healthcare organizations. If successful practices are replicated, more patients may benefit from best practice, which may lessen lengths of stay in hospitals and save costs.

The use of Foley catheters is not limited to CCUs, and with CAUTIs being the most frequently reported hospital-acquired conditions, with more than 560,000 patients developing one every year, this project may be implemented in various healthcare settings. The results of this project may be published in a journal on professional nursing practice. The information that I gathered during the DNP process and in writing up the project may prove valuable to nurses in different settings. Therefore, it will be important to turn the doctoral manuscript into a publication document (Carter-Templeton, 2015). Carter-Templeton (2015) recommended disseminating the knowledge gathered in DNP projects due to its value as evidence-based practice. This DNP project, if published, could be a source of information for practitioners and scholars.

Summary

Patients entering a hospital are in need of healthcare and trust their healthcare team to deliver care of a high standard, entrusting their lives to a team of professionals.

HAIs represent a serious threat to patient safety (CDC, 2017). With over 560,000 patients developing CAUTIs annually, this condition is one of the most common and serious HAIs that patients acquire while receiving treatment for medical or surgical conditions, and they are preventable (DiGiulio, 2015).

Reducing CAUTI rates, preventing injuries, and saving lives were the motivations behind the development of the CAUTI tool, which was based on CDC guidelines. Empowering nurses to determine when a urinary catheter is clinically indicated and providing advanced skills toward inserting and maintaining a catheter is essential in preventing CAUTI and may thus serve to reduce mortality and morbidity (Mehta et al., 2014). This DNP project was aimed at providing training in the use of the CAUTI tool and determining whether the teach-back method increased nurses' knowledge acquisition. The results of the statistical analysis indicated that the difference between the participating nurses' pretest and posttest scores was statistically significant. The results and findings of the DNP project showed that the teach-back method provided statistically significant gains in the participating RNs' knowledge pertaining to catheter care in a CCU setting and the ability to use the CAUTI tool. By using the principles of adult education, I developed an education program to train RNs in evaluating, placing, and caring for catheters, as well as deciding when they should be removed.

The outcomes of this project have positive implications for practice at the research site, as the participating nurses' knowledge levels increased, and at the evidence-based level, there was no CAUTI incidence in the immediate postintervention month. This process may decrease CAUTIs at the CCU if performed on a long-term basis. In

addition, the PowerPoint presentation and the training material will remain at the facility so that the education department can use it in training the rest of the CCU staff and all nursing staff at the facility. The findings of this project have implications for theory, in that the teach-back method yielded results that were better than without the method but not as superior as expected. Further research on how to alter this method to incorporate more andragogy principles, as outlined by Knowles (1970/1996, 1980), may serve to refine the teach-back method further.

The results of the project were shared with core stakeholders, who have the responsibility to disseminate the information further. The dissemination of pertinent information on the protocol to insert catheters when clinically indicated and managing catheters may prevent CAUTI. Reduced CAUTI rates would also have a positive influence on reducing mortality and morbidity from HAIs (Mehta et al., 2014). All nursing staff dealing with catheters could benefit from the training provided in this DNP project. The results of the project were disseminated to the core stakeholders at the project facility by using an oral presentation with PowerPoint slides.

In completing this DNP project, I contemplated the process that I followed and questioned myself as a scholar practitioner. I found that the DNP program enabled me to grow not only as a scholar and practitioner, but also as a person and leader. The applicability of this kind of quality improvement project is wide, as all facilities where catheters are used during patient care can benefit from the findings.

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Appendix A: Education Materials Handouts for Nurses

Appendix A
ANA's Prevention Tool
Page 1

Streamlined Evidence-Based RN Tool: Catheter Associated Urinary Tract Infection (CAUTI) Prevention

AMERICAN NURSES ASSOCIATION

Nurse-Driven CAUTI Prevention: Saving Lives, Preventing Harm and Lowering Cost.

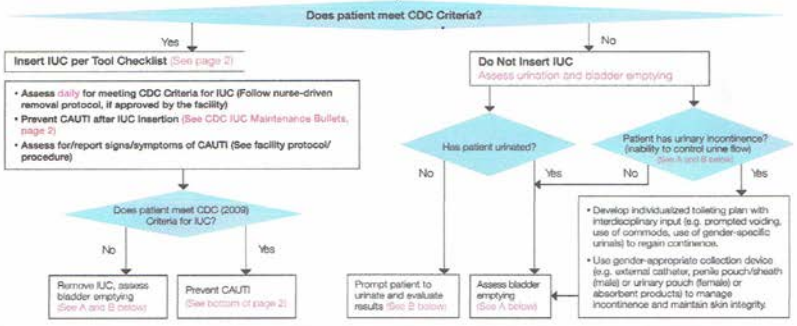
Key Practice Strategies to Reduce CAUTI: 1) Fewer Catheters Used, 2) Timely Removal and 3) Insertion, Maintenance and Post-Removal Care.

Informed by Guidelines for Prevention of Catheter-Associated Urinary Tract Infections (CDC, 2009).

BOX 1

CDC (2009) Criteria for Indwelling Urinary Catheter (IUC) Insertion:

Acute urinary retention (sudden and painful inability to urinate (SUNA, 2008)) or bladder outlet obstruction
To improve comfort for end-of-life care if needed
Critically ill and need for accurate measurements of I&O (e.g., hourly monitoring)
Selected surgical procedures (GU surgery/colorectal surgery)
To assist in healing open sacral or perineal wound in the incontinent patient
Need for intraoperative monitoring of urinary output during surgery or large volumes of fluid or diuretics anticipated
Prolonged immobilization (potentially unstable thoracic or lumbar spine, multiple traumatic injuries such as pelvic fractures)



Assess for Adequate Bladder Emptying

A. If Patient **HAS** urinated (voided) within 4-6 hours follow these guidelines:

- If minimum urinated volume ≤ 180 ml in 4-6 hours or urinary incontinence present, confirm bladder emptying.
  - Prompt patient to urinate/check for spontaneous urination within 2 hours if post-void residual (PVR) < 300-500 ml
    - Recheck PVR within 2 hours.*
  - Perform straight catheterization for PVR per scan ≥ 300-500 ml.
    - Repeat scan within 4-6 hours and determine need for straight catheterization.
    - Report to provider if retention persists ≥ 300-500ml.
    - Perform ongoing straight catheterization per facility protocol to prevent bladder overdistension and renal dysfunction (CDC, 2009), usually every 4-6 hours.
- If urinated >180 ml in 4-6 hours (adequate bladder emptying), use individual plan to promote/maintain normal urination pattern.

B. If Patient **HAS NOT** urinated within 4-6 hours and/or complains of bladder fullness, then determine presence of incomplete bladder emptying.*

- Prompt patient to urinate. If urination volume ≤ 180 ml, perform bladder scan.*

*Perform bladder scan (CDC, 2009) to determine PVR. If no scanner available, perform straight catheterization.

Page 1 of 2

ANA (2014)

Appendix A
ANA's Prevention Tool
Page 2

Indwelling Urinary Catheter (IUC) Insertion Checklist to Prevent CAUTI in the Adult Hospitalized Patient: Important Evidence-Based Steps.	Yes	Yes with Reminder	Comments
Before IUC insertion:			
1) **Determine if IUC is appropriate per the CDC Guidelines** (CDC, 2009) (See page 1, Box 1).			
2) **Select smallest appropriate IUC** (14 Fr., 5ml or 10 ml balloon is usually appropriate unless ordered otherwise).			
3) **Obtain assistance PRN** (e.g., 2-person insertion, mechanical aids) **to facilitate appropriate visualization/insertion technique.**			
4) **Perform hand hygiene.**			
Patient Preparation/Insertion of IUC:			
1) **Perform peri-care**, then, **re-perform hand hygiene.**			
2) **Maintain strict aseptic technique throughout the actual IUC insertion procedure, re-perform hand hygiene upon completion.** • Use sterile gloves and equipment and establish/maintain sterile field. • Do not pre-inflate the balloon to test it, as this is not recommended.			
3) **Insert IUC to appropriate length and check urine flow before balloon inflation to prevent urethral trauma.** • *In males, insert fully to the IUC "y" connection, or in females, advance ~1 inch or 2.5 cm beyond point of urine flow.*			
4) **Inflate IUC balloon correctly:** Inflate to 10 ml for catheters labeled 5 ml or 10 ml per manufacturer's instructions.			
After IUC insertion completion:			
1) Perform **Triple Action for IUC/Drainage System:** • **Secure IUC** to prevent urethral irritation. • **Position drainage bag below the bladder** (but not resting on the floor). • **Check system for closed connections and no obstructions/kinks.**			

Note: Refer to Expert Nurse for consults (e.g., urology, WOC, infection control, geriatrics, rehabilitation) and other team members per facility protocol to reduce iuc use and days and to manage complex care (e.g., incontinence, immobility).

BOX 2

Maintenance of IUC/Drainage System and Other Patient Care to Prevent CAUTI (CDC 2009)

- **Maintain appropriate catheter securement** per facility protocol/procedure and the drainage bag below the level of the bladder at all times (but not on the floor, even when emptying).
- **Empty the drainage bag regularly** using a separate, clean collecting container for each patient; avoid splashing, and prevent contact of the drainage spout.
- **Maintain unobstructed urine flow** by keeping the catheter and tube free from kinking.
- **Maintain a closed drainage system.**
- **If breaks in the closed system are noted** (e.g., disconnection, cracked tubing), replace the catheter and collecting system following above IUC insertion checklist.
- **Perform perineal hygiene** at a minimum, daily per facility protocol/procedure and PRN.
- **Use timely fecal containment device when appropriate for fecal incontinence.**
- **Teach nursing assistants and patient/family iuc maintenance.**

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(ANA, 2014)

Appendix B: Education Program

EDUCATING STAFF ON ANA CAUTI TOOL

CAUTI Prevention Competency Check-Off List

Name initial only _____ Unit: _____

The DNP student / validator will use this checklist to evaluate your performance by using teach back and demonstration method. All steps must be satisfactorily completed during evaluation process.

Critical Elements	Meet Standards	Does Not Meet Standards
Explain what a CAUTI is		
Give 3 examples in which the ANA recommends indwelling Foley catheters.		
What should you do next if a patient has not urinated greater than 180 ml within 4-6 hours?		
What should you do next if a patient has urinated greater than 180 ml within 4-6 hours?		
Give 3 examples how a nurse can prevent infections, once a catheter is in place.		
FOLEY INSERTION DEMONSTRATION CHECKLIST Performed hand hygiene and don non sterile gloves.		
Wash perineal area with soap and water and dry thoroughly. Note of location of urinary meatus.		
Opened outer wrapping of either an indwelling catheterization kit or an intermittent catheterization kit.		
Applied the fenestrated drape.		
Form a continuous sterile field		
Placed the catheter tip and approximately 2.5 to 5 cm of the catheter into lubricant.		
Cleanse the urethral meatus with providone-iodine or other antiseptic cleaning agent if patient is not allergic.		
With the sterile dominant hand, pick up the catheter pick and prepare to insert the lubricated tip into the urinary meatus.		
Insert the catheter 2-3" (5 to 7.5 cm) while continuing to hold the labia apart until urine begins to flow.		
Attach the saline filled syringe into the leur lock and fully inflate the balloon per the manufacturer's instructions to keep in place in the bladder.		
Anchor the catheter with securement device.		
Hang drainage bag below the bladder on the bed but not allowing the bag to drag on the floor		
How confident are you in caring for IUC in patients? (Circle one) Not confident or very confident		
On a scale of 0-5 where 0 is no knowledge and 5 is very knowledgeable, determine if the Teach back method of training has improved your knowledge of CAUTI prevention.		
Do you have any questions?		

Employee Signature _____ Date _____

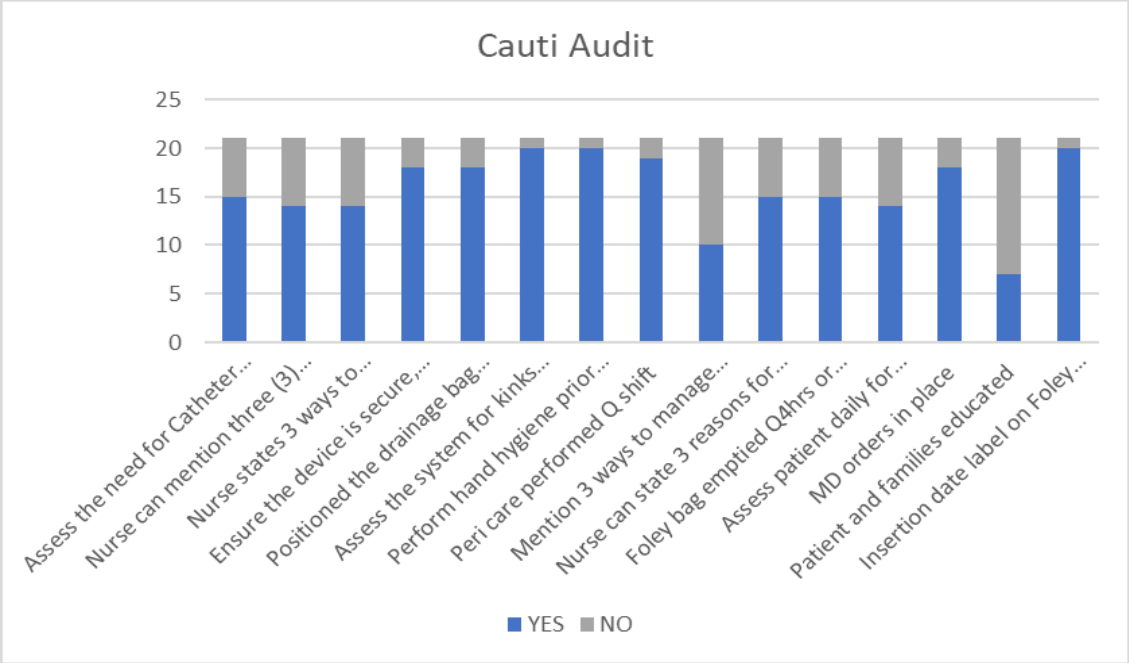
Validator's Signature _____ Date _____

Appendix C: CAUTI Incidence Data for 2018

Month	Critical care data for CAUTI incidence
January	1
February	0
March	3
April	1
May	3
June	0
July	1
August	0
September	1
October	0
November	1
December	0

Appendix D: CAUTI Bundle Audit Tool Report for March

(Pre-Education Month) Measurement of Compliance CCU Nurses



Appendix E: Demographic Data

Highest Level of Education				
	☐ Bachelor's degree			
	☐ Master's degree			
	☐ DNP			
	☐ Other			
What is your age?	23 - 33	34 - 45	46 - 54	
How many years of experience do you have working as a nurse?	>6mth -2 yr.	3yr – 5yr 6yr -10yr	11yr – 24yr	
Sex:	☐ Male	☐ Female	☐ Other	
Race/Ethnicity:	☐ Asian/Pacific Islander	☐ Hispanic/Latino	☐ African American	☐ White/Caucasian
Area of Specialization	☐ Critical Care	☐ Medical Surgical	☐ ER	

Appendix F: Pretest Questionnaire

Pretest Questionnaire

Please answer the following questions on a 0-5-point Likert scale:

On a scale of 0-5 where 0 -1 = very poor knowledge, 2 = poor knowledge 3= average knowledge, 4 = knowledgeable, 5= very knowledgeable

1. Can you explain at least 3 reasons why a patient should have a Foley catheter inserted?

0-1 2 3 4 5

2. Can you demonstrate how to insert a Foley catheter device correctly?

0-1 2 3 4 5

3. How confident are you providing catheter care to all patients with indwelling urinary catheters in your care every shift?

0 -1 2 3 4 5

4. Discontinuing indwelling urinary catheters when no longer indicated is one of my daily priorities

0 -1 2 3 4 5

5.Can you explain to me what maintenance steps are needed when your patients have Foley Catheter?

0-1 2 3 4 5

6. Can you give 3 examples how a nurse can prevent infection, once a catheter is in place.

0-1 2 3 4 5

7. Acute urinary retention is an indication for an indwelling urinary catheter.

0-1 2 3 4 5

8. Can you state 3 possible signs of a Catheter that needed to be clean?

0-1 2 3 4 5

9. How knowledgeable are you in caring for IUC in patients?

0-1 2 3 4 5

10. Rate your knowledge or skills level to teach-back CAUTI prevention.

0-1 2 3 4 5

Appendix G: Posttest Questionnaire

Please answer the following questions on a 0-5-point Likert scale:

On a scale of 0-5 where 0 -1 = very poor knowledge, 2 = poor knowledge 3= average knowledge, 4 = knowledgeable, 5= very knowledgeable

5. Can you explain at least 3 reasons why a patient should have a Foley catheter inserted?

0-1 2 3 4 5

6. Can you demonstrate how to insert a Foley catheter device correctly?

0-1 2 3 4 5

7. How confident are you providing catheter care to all patients with indwelling urinary catheters in your care every shift?

0 -1 2 3 4 5

8. Discontinuing indwelling urinary catheters when no longer indicated is one of my daily priorities

1 -1 2 3 4 5

5.Can you explain to me what maintenance steps are needed when your patients have Foley Catheter?

0-2 2 3 4 5

6. Can you give 3 examples how a nurse can prevent infection, once a catheter is in place.

0-2 2 3 4 5

7. Acute urinary retention is an indication for an indwelling urinary catheter.

0-1 2 3 4 5

8. Can you state 3 possible signs of a Catheter that needed to be clean?

0-1 2 3 4 5

9. How knowledgeable are you in caring for IUC in patients?

0-1 2 3 4 5

10. Rate your knowledge or skills level to teach-back CAUTI prevention.

0-1 2 3 4 5

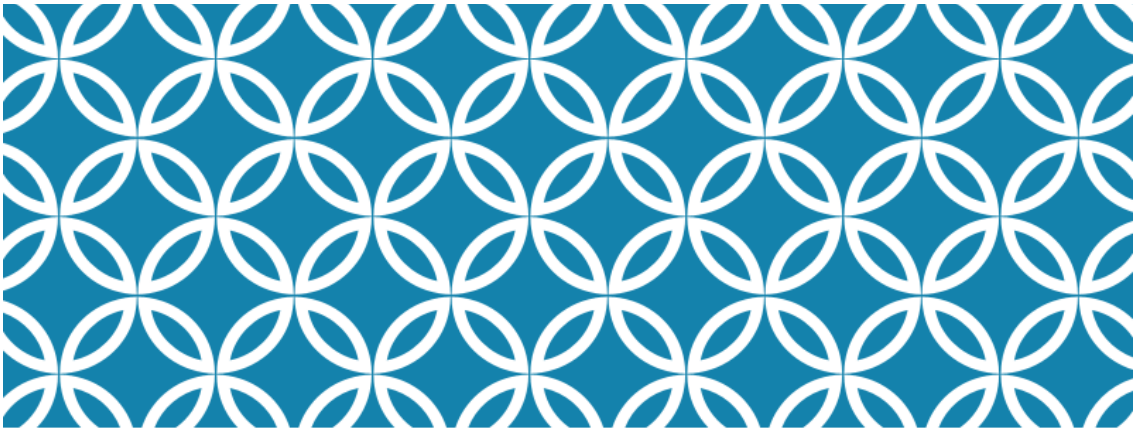
Appendix H: Summary of HICPAC Guidelines Concerning Indwelling Catheter Use

Area of recommendation	Description
Appropriate indications for indwelling catheter use.	• Patient has acute urinary retention or bladder outlet obstruction. • Need for accurate measurements of urinary output in critically ill patients. • Perioperative use for selected surgical procedures: o Patients undergoing urologic surgery or other surgery on contiguous structures of the genitourinary tract. o Anticipated prolonged duration of surgery (catheters inserted for this reason should be removed in PACU). o Patients anticipated to receive large-volume infusions or diuretics during surgery. • Need for intraoperative monitoring of urinary output. • To assist in healing of open sacral or perineal wounds in incontinent patients. • Patient requires prolonged immobilization (e.g., potentially unstable thoracic or lumbar spine, multiple traumatic injuries such as pelvic fractures). To improve comfort for end of life care if needed.
Consider using alternatives to indwelling urethral catheterization in selected patients when appropriate.	• Consider using external catheters as an alternative to indwelling urethral catheters in cooperative male patients without urinary retention or bladder outlet obstruction. • Consider alternatives to chronic indwelling catheters, such as intermittent catheterization, in spinal cord injury patients. Intermittent catheterization is preferable to indwelling urethral or suprapubic catheters in patients with bladder emptying dysfunction. • Consider intermittent catheterization in children with myelomeningocele and neurogenic bladder to reduce the risk of urinary tract deterioration.

Area of recommendation	Description
Proper techniques for urinary catheter maintenance.	• Following aseptic insertion of the urinary catheter, maintain a closed drainage system. • Maintain unobstructed urine flow. • Use Standard Precautions, including the use of gloves and gown as appropriate, during any manipulation of the catheter or collecting system. • Complex urinary drainage systems (utilizing mechanisms for reducing bacterial entry such as antiseptic-release cartridges in the drain port) are not necessary for routine use. • Changing indwelling catheters or drainage bags at routine, fixed intervals are not recommended. Rather, it is suggested to change catheters and drainage bags based on clinical indications such as infection, obstruction, or when the closed system is compromised. • Unless clinical indications exist (e.g., in patients with bacteriuria upon catheter removal post urologic surgery), do not use systemic antimicrobials routinely to prevent CAUTI in patients requiring either short or long-term catheterization. • Do not clean the periureteral area with antiseptics to prevent CAUTI while the catheter is in place. Routine hygiene (e.g., cleansing of the meatal surface during daily bathing or showering) is appropriate. • Unless obstruction is anticipated (e.g., as might occur with bleeding after prostatic or bladder surgery) bladder irrigation is not recommended. • Routine irrigation of the bladder with antimicrobials is not recommended. • Routine instillation of antiseptic or antimicrobial solutions into urinary drainage bags is not recommended. Clamping indwelling catheters prior to removal is not necessary.

Note. Source: Gould, Umsheid, Agarwal, et al. (2017). HICPAC Infection Control Practices Advisory Committee.

Appendix I: PowerPoint Presentation



Education Program for Critical Care Nurses on Preventing Catheter-Associated Urinary Tract Infections

Presenter: Ola Olatunji DNP Student

LEARNING OBJECTIVES AND GOALS

At the end of the module presentation, learners will be able to:

- Explain what is CAUTI;
- Explain why patients should have a Foley catheter in place
- Discuss the element of CAUTI prevention bundle and understand management (Hand washing)
- . Explain ANA's evidence based principles of bladder assessment.
- Explain evidence-based implementation strategies for appropriate catheter insertion, maintenance and removal

- **Goals:** To decrease CAUTI : To improve patient safety

What is CAUTI ?

- Catheter Associated Urinary Tract Infection (CAUTI)
- Most common healthcare associated infection (HAI) that patients acquire while receiving treatment for medical or surgical conditions and are preventable.
- CAUTIs are the most frequently reported hospital-acquired condition, with more than 560,000 patients developing one every year, which prolong hospital stays, increase health care charges, and may eventually result in patient morbidity and mortality (DiGiulio, 2015).

Importance of CAUTI Prevention and penalty

- CAUTIs can result in a wide array of complications for hospitalized patients (CDC, 2017).
- CAUTI results into elevated patient discomfort, longer hospitalizations, as well as higher mortality rates.
- CMS will not pay for CAUTI
- According to CMS, CAUTI cost $424- $451M annually (CMS, 2015a).

FACTS ABOUT CAUTI.

Did you Know ?

80% patients have a urinary tract infection (UTI) during a hospital admission

600,000 patients develop hospital acquired urinary tract infections

About half of the patients with Urinary catheter do not have a valid need for the catheters

- For every day that a urinary catheter remains in the body, the risk of CAUTI increases 5 percent (CDC, 2015)
- Patient can not get a CAUTI , if they don't have a catheter!

What is ANA Cauti Bundle

The ANA tool is based on :

Indicators for catheters

Ensure catheters are not inserted unnecessarily and that they are removed as possible

- The ANA CAUTI tool is centered on evidence-based practices and has been proven operational in combating infections (NPSF, 2015).

Always assess patient urine on admission

- Assess patient prior to Foley catheter insertion,
- Does patient have any indication for UTI
- (cloudy, foul smelling, fever, abdominal/back pain)
- Ask for an order for a UA ONLY first if you notice any of the qualifying criteria
- This could differentiate between a UTI and a CAUTI

APPROPRIATE INDICATIONS FOR INDWELLING URETHRAL CATHETER USE BY ANA

- Patient has acute urinary retention or bladder outlet obstruction.
- Need for accurate measurements of urinary output in critically ill patients.
- Perioperative use for selected surgical procedures:
- To assist in healing of open sacral or perineal wounds in incontinent patients.
- Patient requires prolonged immobilization

URINARY RETENTION AND BLADDER EMPTYING

Assessment for adequate bladder emptying depending whether or not a patient has voided within 4 to 6 hours.

Perform a bladder scan or perform a straight catheterization.

Consider alternatives to an IUC

The best way to prevent a CAUTI is to avoid inserting an unnecessary IUC.

- Pt urinate >180 mL in 4 to 6 hours (It is adequate bladder emptying)

Bladder scanning and straight catheterization should be done for patients who don't sufficiently empty their bladders.

- Pt urinate volume is 180 or < 180 mL in 4 to 6 hours (confirm inadequate bladder emptying)

BEFORE FOLEY CATHETER INSERTION

Perform Hand Hygiene

One of the most effective ways to prevent infections is good hand hygiene.

INSERTION OF A FOLEY CATHETER

- Use sterile technique ALWAYS
- Wash patient genitourinary area with soap and water prior to opening your Foley kit (disinfect skin with iodine If the patient has difficult anatomy for complete sterile insertion
- USE YOUR BUDDY! The buddy is there to assist with the procedure, not ONLY watch.
- Follow the facility Protocol for Foley Insertion

PREVENTING CAUTI

Alcohol-based hand rubs/gels are preferred for hand hygiene almost all the time and are the most effective EXCEPT:

When hands are noticeably dirty, contaminated or soiled

After care with residents with infectious diarrhea (Clostridium difficile: "C-diff")

In these instances: hands should be washed with soap (non-antimicrobial or antimicrobial) and water

maintenance

- Timely removal. Nurse-driven protocols with reminders to remove catheters that don't meet CDC criteria helped to reduce the rate of CAUTIs.
- Care and maintenance. Follow evidence-based recommendations for ongoing catheter care.
- focuses on securing the device, positioning the drainage bag below the bladder,
- assessing the system for kinks and other sources of catheter obstruction to keep urine flowing away from the bladder.
- Keep the system closed. If any breaks in the closed system occur, replace catheter
- Keep the drainage bag below the level of the bladder, but never place the drainage bag on the floor !
- Hygiene. Perineal care should be performed per the institution's protocol and daily at a minimum
- Hand hygiene is imperative to prevent infection.

Daily review of necessity with prompt removal

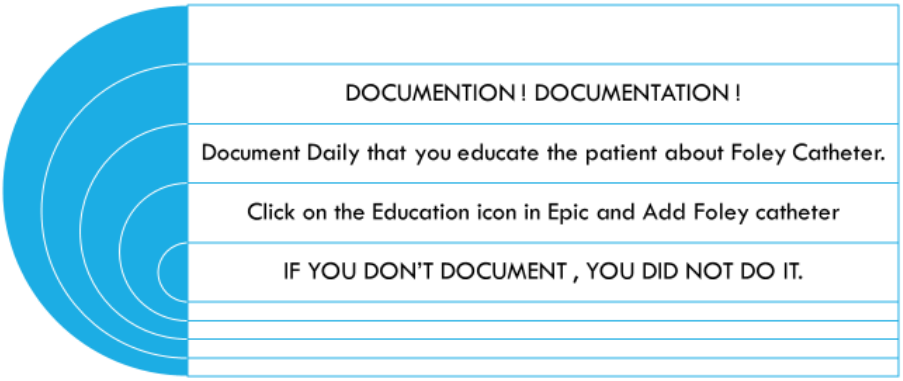
- *"The duration of catheterization is the most important risk factor for development of infection."*
- 74% of hospitals surveyed did not monitor catheter duration
- 47% of patient days had no justification for continued catheterization
- Assess patient daily for continued use and take Foley out if criteria is not met (CDC, 2017).

EVIDENCE OF SUCCESS

Numerous published studies reporting reductions in CAUTI rates of 48-81%

- Use of reminders
- Nurse-driven protocols
- Reduction in duration of catheter days
- *"The duration of catheterisation is the most important risk factor for development of infection." (CDC, 2017)*

LASTLY BUT VERY IMPORTANT !



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THE END

THANK YOU FOR
YOUR ATTENTION !
ANY QUESTIONS ?