

2019

# Preventing Catheter-Associated Urinary Tract Infections with Education on Using the Catheter Bundle

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# Walden University

College of Health Sciences

This is to certify that the doctoral study by

Diana Carlson

has been found to be complete and satisfactory in all respects,  
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the review committee have been made.

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2019

Abstract

Preventing Catheter-Associated Urinary Tract Infections with Education on Using the

Catheter Bundle

by

Diana Carlson

MSN, Walden University, 2016

BS, University of Phoenix, 2011

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

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August 2019

## Abstract

The Centers for Disease Control and Prevention, the Joint Commission, and the Agency for Healthcare Research and Quality recognized the importance of reducing health-care-associated infections (HAIs) and catheter-associated urinary tract infections (CAUTIs) for the safety of all patients. The U.S Department of Health and Human Services has focused on approving a plan to address HAIs in the health care setting with an emphasis on CAUTIs. The purpose of this project was to decrease CAUTI rates on a long-term care and rehab unit by educating staff about using the CAUTI bundle and CAUTI maintenance tool kit. The theoretical framework that guided this project was Knowles's assumption of adult learning. The practice-focused questions addressed the effects of staff education on CAUTI prevention using a CAUTI bundle approach. Pretest and posttest data were collected from all current primary care nursing staff providers at the study site. CAUTI rates were also obtained from the infection prevention and control nurse at the study facility. Implementation of education related to the CAUTI bundle approach led to 2 consecutive months of no CAUTIs in 2019. Findings from the CAUTI project may bring about positive social change by improving patients' quality of life by ensuring they do not develop HAIs. Use of the CAUTI bundle approach may be implemented in long-term care facilities throughout the United States to ensure patients do not acquire HAIs.

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## Dedication

I dedicate this project to my amazing children, their wonderful spouses, beautiful grandchildren, and dear friend Ron. Thank you for understanding, continuous support, and encouragement you provided me throughout this adventure. I love you all!

## Acknowledgments

I would like to acknowledge my preceptor and dear friend, Sheri, who supported me with encouragement and strength. I want to recognize the health care organization that taught me leadership and confidence. I would also like to acknowledge Dr. Matheson and Dr. Nyange who always gave the feedback and steady guidance I needed to assume the role of Doctor of Nursing Practice.

I would also like to recognize the Walden University educators who helped me throughout this adventure.

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## Section 1: Nature of the Project

Urinary catheters are used in long-term care (LTC) at a rate of 5% to 22%, and in the United States every facility could have 10% of their resident population with chronic urinary catheter use (Wald, Richard, Vaughan-Dickson, & Capezuti, 2012). There were 93,000 urinary tract infections in health care in 2011, and 75% of these infections were related to urinary catheter use (Agency for Healthcare Research and Quality, 2010). Indwelling urinary catheters in LTC are used to manage urinary retention, remove bladder outlet obstruction, assist healing of sacral wounds in incontinent patients, and improve patient comfort at end of life.

Patient safety in LTC is a major focus for thousands of LTC facilities across the United States (Krein et al., 2017). The prevention of infections in LTC has been recognized by the Omnibus Budget Reconciliation Act of 1987, which requires all LTC facilities to have an infection prevention and control program (Krein et al., 2017). There is a gap in key aspects of infection prevention and control among licensed and unlicensed staff in LTC (Krein et al., 2017). Innovative education strategies are needed to strengthen CAUTI knowledge. The purpose of the project was to develop a program at the study facility with unit staff leading continued CAUTI education for a LTC unit and CAUTI prevention. Results from a study by the Agency for Healthcare Research and Quality Safety Program (AHRQ, as cited in Krein et al., 2017) indicated that educational CAUTI programs have positive outcomes and provide increased awareness of CAUTI with a willingness to modify current practice by nursing staff.

The purpose of the CAUTI reduction project for the project site's LTC unit was to reduce CAUTI rates using a CAUTI bundle tool and unit team approach. There was a need to understand the clinical indications of CAUTI and to educate the frontline staff on CAUTI prevention using evidence-based research (see McNeill, 2014). It was essential to have an educated CAUTI team to assess urinary catheter use daily to produce positive social change.

### **Problem Statement**

The Centers for Medicare and Medicaid Services (CMS) implemented guidelines of practice to encourage facilities to develop preventative approaches to health-care-associated infections (HAIs; McNeill, 2017). Although this recommendation was implemented in 2008 nationally, there was consistent nonadherence to the CMS guidelines at the study site, and between 2009 and 2013 catheter-associated urinary tract infection (CAUTI) rates increased 6% at the project site and nationwide (Wald et al., 2012).

The project site is a 50-bed inpatient acute, extended care, and rehabilitation facility. The patient population serviced is adult male and female patients. The project site had experienced increases in CAUTI rates without change of unit staff or patient comorbidities resulting in the need to determine why and what is needed to identify and decrease these undesirable occurrences.

CAUTIs are preventable, and the CMS guidelines can help to decrease CAUTI rates through education of nursing staff. Nurses are a vital element in the prevention of HAIs and CAUTIs. Using evidence-based research for education, the study facility can

decrease the rate of CAUTIs and save patients' lives. It was essential to assess urinary catheter use and staff knowledge about CAUTI management for the improvement of patient care at the project site. CAUTI reduction is important to the nursing profession because it correlates to patient safety in health care.

### **Purpose**

The purpose of the project was to implement a staff education project to decrease CAUTI rates at the study facility. Decreasing CAUTI rates in the LTC unit is the goal of the LTC unit manager, unit medical provider, and the facility leadership. The data indicated that there was an upward trend in CAUTI rates during the beginning months of 2018 through the beginning months of 2019. There was a need for continuous monitoring of CAUTI rates at the project site to decrease CAUTI rates by 25%. The LTC unit had a notable increase in CAUTI rates from 6.06 during October through December 2017 to 9.41 during January through March 2018. The CAUTI rate for the project site for 2018 was 3.37. Although CAUTI rates were decreasing there was room for improvement because the organization has a goal to decrease the CAUTI rate by 25%. There was a desire among study facility administrators for continuous monitoring of CAUTI rates and CAUTI education for nursing staff.

The CMS (2018) created strategies to engage frontline nursing staff to improve the quality of patient care and satisfaction through education. The purpose of this staff education project was to determine whether using evidence-based research to educate nurses would improve the knowledge and confidence of nurses managing patients with indwelling urinary catheters.

Gaps in practice exist in what patient care is practiced and what is included in the national recommendations for CAUTI prevention. One gap is ensuring that only properly trained individuals are responsible for urinary catheter insertion and maintenance processes and another gap is ensuring proper education and training for urinary catheters techniques (C.V. Gould, Umscheid, Agarwal, & HICPAC, 2009). The positive social change outcomes of this project include a decrease in CAUTI rates at the study site LTC unit and an increase in staff confidence in patient care.

### **Nature of the Project**

I conducted a staff education project at the study site related to CAUTI prevention. Pre- and posttest staff education data were obtained and analyzed, and de-identified patient data were obtained from the quality department and the infection prevention and control nurse related to CAUTI rates. This project was guided by the following practice-focused questions:

1. Does education on CAUTI prevention using a CAUTI bundle approach increase the confidence and knowledge of nursing staff?
2. Does the use of a staff educational approach, using a CAUTI bundle, decrease CAUTI rates in the LTC facility?

### **Significance**

CAUTIs continue to be a significant and preventable patient care problem. Using evidence-based research to promote a practice process change in LTC and to change a culture of thinking may improve urinary catheter placement and maintenance. A cultural change may produce a positive effect on the unit staff, the unit patients, and the

organization's leadership for organizational success. The use of a safety program for LTC CAUTI reduction using evidence-based practice may reduce infection rates and improve safety culture through improved communication and teamwork. The CAUTI reduction education program improved hygiene practices and encouraged appropriate placement and maintenance of catheters. There is an emphasis on the importance of urinary catheter surveillance and evaluations to reduce HAIs and CAUTIs (Meddings et al., 2017). The identification of champion staff is crucial to change behaviors regarding catheter use and to facilitate new strategies. Nationally, interest and educational resources for the prevention of CAUTIs are expanding because of the mandated reporting to CMS and the reduced reimbursement for preventable HAIs (Meddings et al., 2017). Health care facilities are understanding the importance of educating front line nursing staff about CAUTI prevention to ensure they have evidence-based information to maintain effective patient care in the prevention of CAUTIs and to encourage change in a population that can be reluctant to change (Sayhen & Ozbas, 2018).

### **Summary**

CAUTIs continue to be a significant and preventable patient care problem. Morbidity and mortality associated with HAIs and CAUTIs are costly to health care and life. Staff education and culture change using evidence-based research, a CAUTI bundle, and CAUTI maintenance may reduce CAUTIs and an increase patient satisfaction. In Section 2, I discuss the background and context of the project.

## Section 2: Background and Context

The major risk for CAUTIs is urethral catheterization, and the risk increases with the length of time a urinary catheter remains in place (DD Gould, Gaze, Drey, & Cooper, 2017). The indwelling urinary catheter is often an uncomfortable, unnecessary, and forgotten device used in health care for convenience in urinary maintenance. CAUTIs are among the first hospital-acquired condition selected for non-payment by CMS (Meddings et al., 2017). A patient without an indwelling urinary catheter does not develop a CAUTI. Recent studies indicated that interventions to prevent CAUTIs have been attempted, but inappropriate catheter placement continues (Meddings et al., 2017). Several studies showed that between 21% and 55.7% of urinary catheters are placed in patients without appropriate indications (Meddings et al., 2017). However, urinary catheters are indicated and appropriate for many patients, especially those in LTC. Urinary catheter monitoring and evaluation of catheter use by staff champions at the study site were needed to promote staff compliance and to changing the unit culture.

A CAUTI occurs when bacteria enter the urinary tract through an indwelling urinary catheter from poor catheter maintenance or insertion. Risk factors for developing a CAUTI include age-related physical changes to the urinary tract, comorbid conditions from infection, and the need for continued catheter use to manage voiding (CDC, 2018). Symptoms of a CAUTI include mild fever, urethritis, cystitis, severe renal scarring, acute pyelonephritis, or bacteremia (Revello & Gallo, 2013). The importance of implementing current evidence-based practice is critical to decrease and prevent CAUTI development.



Best practice in CAUTI prevention is to avoid catheter use when possible. Most patients with long-term catheter use often have persistent asymptomatic bacteremia, and Mody et al. (2015). noting that 95% of urine cultures contained > 50,000 colony-forming units per milliliter in 200 samples. A quality process should be in place in LTC for continual monitoring and evaluation of urinary catheter placement and discontinuation of the catheter when appropriate. A team approach for CAUTI prevention should include facility leadership, an administrative champion, a unit team lead, and a unit staff champion (Mody et al., 2015). Engaging and educating the collaborative team will enhance CAUTI prevention knowledge and may change the culture for safe patient care.

The objective of this project was to use evidence-based research to educate staff on current best practice using a bundle approach in the prevention of CAUTI. A gap existed between LTC staff actions and evidence-based research actions. The sustainability of this project depended on thorough staff education and coaching to help the LTC staff implement strategies for CAUTI prevention success. The practice-focused questions were all following:

1. Does education on CAUTI prevention using a CAUTI bundle approach increase the confidence and knowledge of nursing staff?
2. Does the use of a staff educational approach, using a CAUTI bundle, decrease CAUTI rates in the LTC facility?

### **Theoretical Framework**

The conceptual framework that guided this project was Knowles's assumption of adult learning. Knowles's theoretical framework has two elements:: andragogy that is

concerned with adult learning and the pedagogy that is focused on youth learning (McEwen & Wills, 2014). In the current projected I focused on andragogy. Knowles argued that the single most important aspect to helping adult learners is to create an atmosphere of physical comfort, mutual trust, respect, openness, and acceptance (McEwen & Wills, 2014).

Knowles's perspective is that adult learners need to know why they should learn something new. There are six characteristics to Knowles's learning framework:

1. Adult learners need to know why they need to learn something new.
2. Adult learners' self-concept moves from being dependent to being self-directed.
3. Adult learners mature and accumulate experience that serves as a resource for learning.
4. Adult learners create readiness from real-life situations.
5. Adult learners' perspective changes as they mature.
6. Adult learners are motivated by a desire to prove and solve practical problems (McEwen & Wills, 2014).

Knowles' conceptual framework includes a natural progression in learning from lower to higher forms with age and experience (McEwen & Wills, 2014). Nurses learn when developing and implementing new situations in their daily practice. These new situations in health care encourage the nurse learner to go further using knowledge and lifelong learning.

Table 1

*Knowles's Learner Framework*

Characteristics	Pedagogy	Andragogy
Need to know	Dependent on others for learning	Independent and self-directed
Self-concept	Dependent on others for evaluation	Independent for self-learning
Experience	The learner comes with little experience	The learner comes with great quality of experience
Readiness	Learners are told what to do	Change trigger readiness to learn
Orientation to learning	Learning is a process of acquiring subject matter	Learners want to perform and solve problems
Motivation	Learners are motivated by external factors	Learners have internal motivation

### **Relevance to Nursing Practice**

Catheter-associated urinary tract infections are a daunting challenge for LTC units. The need to monitor, evaluate, and enhance patient safety in LTC facilities is becoming increasingly significant with approximately 1.5 million Americans living in LTC facilities and 5% to 22% of these residents requiring urinary catheter placement (Mody et al., 2015). Every day a urinary catheter remains in place, the risk of a CAUTI developing increases by 5% (CDC, 2018).

Nurses play a significant role in CAUTI prevention as patient safety advocates. Reduction and prevention of HAIs are crucial for LTC patient health. One of the first evidence-based preventative measures for CAUTI prevention is education on appropriate catheter use, insertion, and maintenance (McNeill, 2017). Urinary catheters are often used for noncritical reasons or left in place by careless providers. There are five million urinary catheters placed annually in the United States, and 50% of these are not medically necessary (McNeill, 2017). Through staff education, this number could be significantly decreased, and CAUTIs could be reduced.

Education is the key to quality patient care. Nurses who have continuous training using evidence-based research in best practice are the backbone of quality patient care and the health care organization. Frontline nursing staff play an important role in positive outcomes related to indwelling urinary catheter. Evidence-based education may play a significant role in patient outcomes and CAUTI rates. Nurses are a vital element in the prevention of CAUTIs and are important as patient advocates (McNeill, 2017). Trained nurses and nursing staff create a positive healing environment. CAUTI interventions include using the CAUTI bundle (Meddings et al., 2017), which involves the education of clinical staff with clinical skills in urinary catheter placement, maintenance, and behavioral interventions to improve urinary catheter aseptic insertion, catheter maintenance, appropriate clinical use, and unit behavioral interventions for catheter use.

The National Institute on Aging evaluated a targeted infection preventions (TIP) modality intervention program to reduce multidrug resistant organism prevalence and device-associated infections (Mody et al., 2015). Along with the TIP intervention, a

CAUTI bundle was put in place. The CAUTI bundle key components were to centralize care efforts to promote safe patient care. The program was instituted by AHRQ to have clinical components for CAUTI prevention:

1. **C:** Catheters need to be assessed for necessity.
2. **A:** Aseptic technique for urinary catheter insertion and good hand-hygiene should be used with all catheter care.
3. **U:** The use of catheters only if indicated, not for convenience.
4. **T:** Training and mentorship of nursing staff and family care is important.
5. **I:** There should be incontinence care planning and management (Mody et al., 2015).

The initial step is building the clinical component of educating nurses on the CAUTI bundle (Mody et al., 2015). The CAUTI bundle is a CDC (2018) process that includes appropriate urinary catheter use, proper urinary catheter insertion, proper urinary catheter maintenance, leadership infrastructure, and a surveillance process for LTC CAUTI rates.

### **Background and Context**

The management of patients with indwelling urinary catheters at the project site was a health risk that needed to be addressed by the health care organization. Infections in LTC patients are associated with high rates of morbidity and mortality, re-hospitalizations, extended hospital stays, and an increase in health care costs (Mody et al., 2015). Despite the connection between urinary catheter use and urinary infections, health care facilities continue to struggle with preventing CAUTIs. Current CAUTI rates at the project site indicated an alarming increase in infections. The project site leadership

and unit management completed CAUTI education for the LTC unit, but the CAUTI rates continued to rise. According to the infection prevention and control nurse the project site CAUTI rates for January through March 2018 were 9.41 per 1,000 bed days of care, which indicated an increase from 6.06 during October through December 2017. The CAUTI bundle plan was used to optimize the quality of patient care. Using evidence-based research to educate nursing staff increased their confidence when using the CAUTI bundle approach. The CAUTI bundle approach helped to increase nursing staff success and patient safety on the LTC unit of the project site.

A national initiative was implemented in 2009 by the CDC to affect nursing practice (C.V. et al., 2009). There were specific recommendations for health care facilities caring for patients who require urinary catheters (C.V. Gould et al., 2009) . These recommendations included the development of quality improvement programs to monitor the new processes and measure the outcomes for effectiveness based on internal and external reporting (C.V. Gould et al., 2009). Implemented recommendations included the following:

- Appropriate urinary catheter use: Avoid using urinary catheters in LTC for convenience to manage incontinence and there must be appropriate indications for the catheter use (C.V. Gould et al., 2009).
- Aseptic insertion of urinary catheters: Proper training of individuals for aseptic technique for catheter insertion is recommended (C.V. Gould et al., 2009).

- Proper urinary catheter maintenance is required: Aseptic insertion technique is recommended followed by education of urinary catheter maintenance (C.V. Gould., 2009).
- Documentation, compliance, outcome measurements will be followed by internal and external reviews (C.V. Gould, et al. 2009). Optimal materials for reducing the risk of CAUTI should be available at all times (C.V. Gould, et al. 2009).
- Prevention of transmission: Spatial separation of patients with urinary catheters and prevention of cross-infection through staff training (C.V. Gould et al., 2009).
- The AHRQ also implemented a change focusing on the importance of frontline nursing staff and executive leadership rounds to promote a culture of patient safety (Joshi, Ransom, Nash, & Ransom, 2014). The AHRQ had a goal to create and maintain a culture of patient safety that could be sustained and have continued improvements over time (Joshi, Ransom, Nash, & Ransom, 2014).

National initiatives were intended to improve patient care, patient safety, and patient outcomes and to decrease health care costs. Quality patient care is a moral process for organizations, and it is imperative to have a continuous improvement process in place to gain the public's confidence (Joshi et al., 2014). It is imperative to focus on an overall goal to continuously evaluate and improve patient care (Joshi et al. 2014). Continual collaboration with frontline nursing staff and leadership can have an

impact on the reduction of CAUTI rates through staff training (Krein et al., 2017). Health care in the United States starts at the top of an organization with leadership and ends with high-quality patient care through education and the recognition of the importance of preventing CAUTI infections in LTC (Krein et al., 2017).

### **Role of the DNP Student**

The project consisted of a pre- and posttest composed of questions taken from the professional knowledge I gained throughout this project. To be a successful doctoral leader, I had to understand the significance of my actions as an educator, be a good listener, and use evidence-based information obtained from the CAUTI project's success to guide others. The LTC nursing staff participated in the pre- and posttest and monthly unit meetings that included CAUTI reduction tips. I also used a full body mannikin on the unit for hands-on training. The staff had the opportunity to perform sterile urinary catheter insertion, peri care, and catheter maintenance. The education also consisted of a trifold bullet-point information board using evidence-based information. The CAUTI rates were obtained and calculated by the infection prevention and control nurse in the quality department. The data were collected and calculated following the unit staff education to determine the outcomes of the staff education.

I developed an education process for nursing staff to become familiar with the CAUTI bundle to decrease CAUTIs. The project helped nursing staff gain confidence in the CAUTI bundle through education and comparing the old process to the new process. Nursing staff know what works on the unit. I used evidence-based research to increase



confidence in staff through education on a new process that can be more effective in improving the safety and care of the patient (Zaccagnini & White, 2014).

### **Summary**

Evidence-based guidelines for CAUTI prevention were introduced in 2009 with a national goal to decrease CAUTIs by 25% (Saint et al., 2013). The National Institute on Aging and AHRQ have funded research in reducing HAIs and CAUTIs (Mody et al., 2015). The focus for CAUTI reduction should be performance improvement quality processes to bridge the gap between CAUTI and staff training.

The analysis of the data obtained from the project helped to determine the extent of the staff education training needed and how best to present the information. Staff education can cultivate confidence. Changing the LTC project site culture of thinking about patient care using evidence-based research, a CAUTI bundle, and a CAUTI maintenance protocol may create positive outcomes for a reduction in CAUTIs and an increase in patient satisfaction. In Section 3, I discuss the collection and analysis of evidence for the project.

### Section 3: Collection and Analysis of Evidence

CAUTIs are preventable patient care issues. Morbidity and mortality associated with HAIs and CAUTIs are costly to the health care system and patient safety. Staff education and culture change using evidence-based research, a CAUTI bundle, and CAUTI maintenance protocol may create positive outcomes for a reduction in CAUTIs and an increase in patient satisfaction. Using evidence-based research to educate staff on current best practice in the prevention of CAUTI may decrease the gap in knowledge that exists between LTC staff actions and evidence-based research actions. The sustainability of this project depended on thorough staff education and coaching to help the LTC staff implement strategies for CAUTI prevention success.

#### **Practice-Focused Questions**

The importance of preventing HAIs and CAUTIs in LTC is a national patient safety concern (Krein et al., 2017). Enhancing patient safety in LTC is a national initiative along with reducing health care costs. Nursing staff are on the frontline in recognizing and correcting patient care issues that include preventable infections including CAUTIs. The practice-focused questions for CAUTI reduction and prevention include the following:

1. Does education on CAUTI prevention using a CAUTI bundle approach increase the confidence and knowledge of nursing staff?
2. Does the use of a staff educational approach, using a CAUTI bundle, decrease CAUTI rates in the LTC facility?

I analyzed the quality and effectiveness of the staff education project as it related to CAUTI infections and the nursing staff's understanding of CAUTI development.

### **Sources of Evidence**

#### **Participants**

Nurses compose the largest section of employees at the project site and the largest group providing patient care nationally. The project site takes the position that using continued education with evidence-based information will improve patient outcomes and satisfaction. CAUTI bundle education will have an impact on enhancing indwelling catheter management, decreasing the gap in nurses' knowledge, and improving nursing staff practice (Mody, Greene, & Meddings, 2017).

The nursing staff for this project consisted of men and women of various ages, educational backgrounds, and years of nursing care experience. The education from this project will be mandatory as it will become the new nursing care practice for the facility. I met with nursing staff during unit meetings and gave them a pre- and posttest CAUTI Bundle (Appendix A and Appendix B) to determine their knowledge and confidence level in indwelling catheter care in respect to patient care. The trainings included education on the components of the CAUTI bundle process to improve patient safety. The unit meeting information was related to the CAUTI process with in-depth education on catheter maintenance, catheter insertion, and peri care. Approval from the facility and Walden University's institutional review board (# 03-26-19-0173349) was obtained prior to the project implementation.

## **Process and Procedure**

Using the DNP Manual for Staff Education from Walden University as a guide, I developed an education program. The education was presented in a power point format. A Power Point presentation was chosen for project dissemination due to the ease of understanding and the enhancement of information and content using this type of presentation (see White, Dudley-Brown, & Terhaar, 2016). CAUTI bundle education will have an impact on enhancing indwelling catheter management, decreasing the gap in nurses' knowledge, and improving nursing staff practice (Mody et al., 2017).

## **Analysis and Synthesis**

I conducted training during unit meetings with the approval of the nurse manager for the CAUTI bundle process. Hands-on training including a manikin, urinary catheter and peri-care supplies was offered to all patient care staff. I also assessed their urinary catheter skills following facility and nurse manager approval. I also used a pre- and posttest that consisted of information obtained from the CAUTI bundle maintenance and the compliance tool. A power Point (Appendix C) was also used highlighting CAUTI information. The testing was administered and reviewed during the hands-on training to ensure the education would not take away from patient care would be repetitive, and would include tactile, visual, and written learning styles. Patient care skills can be enhanced using evidence-based education to influence, broaden, and strengthen nurses confidence (Springer & Evans, 2016).

CAUTI rates were obtained from the infection prevention and control nurse at the study facility. The data were reviewed for the months of the study period. I compared

CAUTI rates before and after staff education. The information gained from the CAUTI rates was used to determine the effectiveness of the training and to indicate where changes could be made for improving CAUTI rates.

### **Summary**

Nurses' professional knowledge is connected to continued education using evidence-based research. Health promotion and research are an asset in professional design, growth, and promotion of a higher quality patient care environment (Springer & Evans, 2016). CAUTIs affect millions of Americans every day (Springer & Evans, 2016). Clinical guideline development is becoming increasingly important in LTC as catheterized patients have become recognized as a major reservoir of antibacterial-resistant organisms and the source of preventable CAUTI infections (C.V. Gould et al., 2009).

The unit staff education project provided information based on current national guidelines and standards for patient safety. Changing a culture and nursing staff perceptions often takes time and requires diligence by nurse leaders. The presence of frontline nurse leaders is essential for positive patient care outcomes and the growth of nurse confidence in their patient care skills (Joshi et al., 2014).

CAUTIs are preventable infections, and nurses can have a significant effect on this type of HAI and patient outcomes. Using best practice guidelines nurse can decrease CAUTIs through staff engagement, education, and continuous monitoring (Parker et al., 2017). This CAUTI project provided nursing staff the evidence-based knowledge and

tools to incorporate into their daily nursing practice following the facility's policy process and national standards.

#### Section 4: Findings and Recommendations

CAUTIs are possibly the most preventable HAI. Using evidence-based research to educate nurses regarding interventions presented in the CAUTI bundle demonstrated clear findings that staff education may improve patient care quality (Parker et al., 2017). The CMS (as cited in Hartman et al., 2012) introduced new policy and adjusted reimbursement payments for HAIs that are not present on admission to hospital and LTC facilities, which caused health care organizations to pay approximately \$29 billion dollars per year for preventable infections.

The purpose of the project was to identify the effect of evidence-based education on the nursing staff in the LTC unit of the study facility regarding rising CAUTI rates. The goal of the project was to implement education and improve nurses' confidence in reducing CAUTI rates. The practice-focused questions included the following:

1. Does education on CAUTI prevention using a CAUTI bundle approach increase the confidence and knowledge of nursing staff?
2. Does the use of a staff educational approach, using a CAUTI bundle, decrease CAUTI rates in the LTC facility?

The study facility had a surge in CAUTI rates in the first quarter of fiscal year 2018. The LTC unit did not experience new staff changes, nurse-to-patient ratios, or patient populations. The study facility wants to determine the reasons for an increase in CAUTI rates and to develop an annual education program with evidence-based research. The study facility also wants to develop a unit program with unit staff champions as

educators. In Table 2 the CAUTI rate findings are broken down by fiscal year quarters with 2019 findings per month.

Table 2

*CAUTI Rate Findings Per Quarter for Fiscal Year 2018*

CAUTI Dates	Year	CAUTI per 1000 bed days of care
Oct-Dec	2017-2018	6.06
Jan-March	2018	5.51
April-June	2018	4.52
July-Sep	2018	4.52
Oct-Dec	2018	3.33
January	2019	0.00
February	2019	6.53
March	2019	0.00
April	2019	0.00

### **Findings and Implications**

The entire nursing staff of 33 nurses participated in the education program. Consent was obtained prior to the start of the CAUTI reduction program. The pre- and posttest consisted of questions taken from the CAUTI bundle from CMS created by the infection prevention and control nurse (Appendix A and Appendix B). The LTC nursing staff participated in the pre- and posttest that extended over a 2-week period. The unit meetings included CAUTI reduction tips. I also used a full body mannikin on the unit for 2 weeks of hands-on training. The staff performed sterile urinary catheter insertion, peri care, and catheter maintenance. The education also consisted of a trifold bullet-point information board. The CAUTI rates used for this project demonstrated that consistent



nursing staff education can lead to decreased CAUTI rates. There was not another time in 2018 or 2019 that demonstrated consecutive months without CAUTIs. The CAUTI rates were calculated by the infection prevention and control nurse in the quality department. The data were collected and calculated prior to and following the unit staff education. Table 3 shows the positive outcomes of the staff education.

Table 3

*Staff Education*

	# nursing staff	# trained nursing staff	CAUTI rates in January 2018 through April 2019
CAUTI education	33	0	5.87 in 2018
CAUTI education	33	33	2.47 in 2019

**Recommendations**

The CAUTI bundle project will be an ongoing process on the LTC unit of the study facility. The staff education project included creation of unit staff champions. The unit staff will continue the CAUTI reduction program by reporting to leadership, the infection prevention and control nurse, and the unit manager. The quality and success of the CAUTI project has created confidence in the nursing staff through peer mentors they respect.

The continued training will be incorporated into annual and new employee nursing staff training to ensure the project facility will not create a gap in knowledge and will continue to promote positive patient outcomes. The project facility leadership has accepted and supported the project, training, and continued success.

### **Strengths and Limitations of the Project**

The project facility site will continue the CAUTI bundle project for the improvement of patient care. A strength of the project was that 100% of the current nursing staff and new employees used and will continue to use the new process included ongoing evaluations to implement needed changes. The study facility will now perform monthly evaluations of CAUTI rates to identify gaps in unit staff progress. Leadership supported the CAUTI bundle process, which indicated their commitment to the quality and safety of the patient population. The limitations in the CAUTI bundle project were that the data were gathered during a short period of 2 months and the project education did not include any new employees. A recommendation for future projects would be to extend the months of data gathering and determine a way to include new employees in the education.

## Section 5: Dissemination Plan

The purpose of this project was to determine of the effect of nursing staff education on nurses' practice confidence and the use of the CAUTI bundle. The project findings were presented to leadership, unit management, and the unit nursing staff. The research literature indicated that staff education can have a positive effect on CAUTI rate reduction (see Freeman-Jobson, Rogers, & Ward-Smith, 2016). The evidence-based research used for this project indicated that educating nursing staff improves confidence in patient care and desired outcomes demonstrated by the projects results (see Freeman-Jobson, Rogers, & Ward-Smith, 2016). Staff involvement and education on the CAUTI bundle project demonstrated a decrease in CAUTI rates over a 2-month period to 0% CAUTIs. Most direct patient care is provided by nursing staff of all educational backgrounds, and it is important to support all staff because they can recognize subtle changes in their patients. Continuation of the staff education project may have positive effects on the quality of patients' lives.

The dissemination of this project has given me a voice and has shown that with the use of evidence-based information and education can promote positive outcomes for the patient population of the study facility LTC unit. I have been blessed to work with health care providers from other disciplines to influence change. Implementation of the CAUTI bundle has shown positive patient care outcomes. Combining assets of individuals and the unit environment increases patient health promotion (Springer & Evans, 2016). The success of the CAUTI bundle project may be sustainable through continued education and leadership involvement.

### **Analysis of Self**

My leadership skills as a scholarly practitioner have grown throughout my capstone progress. The word that best describes the leadership skill I have gained is *confidence*. I have new knowledge, leadership skills, and competence in disseminating research (see Zaccagnini & White, 2014). I am also confident in my ability to respond to organizational and health system issues. I have learned there is a process with organizational change that can't be rushed and requires evidence-based knowledge. Health organizational change takes time with patience and guidance from leadership, and health policy change is worth any work put into it. Evidence-based research can be used to transform health care through advanced practice nurses and a team-leaders working on an interdisciplinary team. Interdisciplinary teamwork is essential for positive patient outcomes (see Zaccagnini & White, 2014).

I have gained insight watching leadership and middle management approach changes in the LTC study facility there is often a higher level of management with different approaches and expectations to changes and how these changes will be realized. Any change has to be transparent from the initial idea to the staff involved to the facility leadership to have positive outcome (see Zaccagnini & White, 2014). The hierarchy of health care organizations includes the business leaders who are not always focused on patient care like nurses are. I have to remember that everything starts with an emphasis on the frontline level including nursing staff.

I have gained confidence in myself with of all of the evidence-based research I have been reviewing. I have been able to disseminate my research into clinical practice

using the scientific literature reviewed. I am aware that the use of evidence to support clinical practice occurs from the use of evidence-based research (see Zaccagnini & White, 2014).

Interdisciplinary teams huddle, do rounds, and collaborate to promote positive patient outcomes (White et al., 2016). I have been part of collaborative meetings that focus on individual patients. At times the meetings flow, but other times there is discussion and conflict in patient care decisions. I have watched and learned to listen and take into consideration input from all disciplines because every discipline approaches the patient differently. I have learned that a team effort does not always create positive patient outcomes without collaboration.

Legal and ethical issues are important elements of patient care. Researchers and health care leaders have an ethical code of conduct for clinical practice to follow as it relates to honesty and disclosure of patient information (Zaccagnini & White, 2014). Leaders also has to be aware of disclosure of information as it relates to the organization and the betterment of all including what to disclose to protect workers. Prior to completing my project, I did not possess leadership skills; however, I now have confidence in myself and how to present information to promote practice change. The essentials of doctoral education have enhanced my competence as an advanced nurse practitioner (see American Association of Colleges of Nursing, 2014).

### **Summary**

CAUTIs have been identified as one of the leading causes of HAIs and should be a concern of all health care facilities and nursing care providers. The reduction of

CAUTIs in health care requires consistent education supported by facility leadership and management. This CAUTI reduction project demonstrated that consistent staff education can produce a decrease in CAUTIs. Findings from this project demonstrated that frontline nursing staff play a major role in improving patient outcomes. Nursing staff are required to have ongoing training. This project's positive results of decreasing CAUTIs over a short period with knowledge review and hands-on training demonstrates that a review of basics along with new best practice processes can produce positive patient outcomes.

## References

- AHRQ Safety Program for Long-Term Care: CAUTI. (2014). Retrieved from [www.ahrq.gov](http://www.ahrq.gov)
- American Association of Colleges of Nursing. (2014). Retrieved from <https://www.aacn.nche.edu/publications/position/dnpessentials.pdf>
- Buck, H. G., Kolanowski, A., Fick, D., & Baronner, L. B. (2016). Improving rural geriatric care through education: A scalable, collaboration project. *Journal of Continuing Education in Nursing, 47*(7), 306-313. <https://doi.org/10.3928/00220124-20160616-06>
- Centers for Disease Control and Prevention. (2018). *Catheter-associated urinary tract infections (CAUTI)*. Retrieved from <https://www.cdc.gov/infectioncontrol/guidelines/cauti/index.html>
- Freeman-Jobson, J. H., Rogers, J. L., & Ward-Smith, P. (2016). Effect of an education presentation on the knowledge and awareness of urinary tract infections among 242 non-licensed and licensed health care workers in long-term care facilities. *Urologic Nursing, 36*(2), 67-71. <https://doi.org/10.7257/1053-816X.2016.36.2.67>
- Gould, C. V., Umscheid, C. A., Agarwal, R. K., & HICPAC (Eds.). (2009). Guidelines for prevention of catheter-associated urinary tract infections 2009 [Entire issue]. *Department of Human Health Services*. Retrieved from <https://www.cdc.gov/infection control/pdf/guidelines-cauti/guidelines/pdf>
- Gould, D., Gaze, S., Drey, N., & Cooper, T. (2017). Implementing clinical guidelines to prevent catheter-associated urinary tract infections and improve catheter care in

- nursing homes: Systemic review. *American Journal of Infection Control*, 45(1), 471-476. <https://doi.org/10.1016/j.ajic.2016.09.015>
- Hartman, C. W., Hoff, T., Palmer, J. A., Wroe, P., Dutta-Linn, M. M., & Lee, G. (2012). The Medicare policy of payment adjustment for health care associated infections: Perspectives on potential unintended consequences. *Medical Care Research and Review*, 69(1), 45-61. <https://doi.org/10.1177/1077558711413606>
- Joshi, M. S., Ransom, E. R., Nash, D. B., & Ransom, S. B. (2014). *The healthcare quality book: vision, strategy, and tools* (3rd ed.). Chicago, IL: Health Administration Press.
- Krein, S. L., Harrod, M., Collier, S., Davis, K. K., Rolle, A. J., Fowler, K. E., & Mody, L. (2017). A national collaborative approach to reduce catheter-associated urinary tract infections in nursing homes: A qualitative assessment. *American Journal of Infection Control*, 45(1), 1342-1348. <https://doi.org/10.1016/j.ajic.2017.07.006>
- McEwen, M., & Wills, E. M. (2014). *Theoretical basis for nursing* (4th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.
- McNeill, L. (2017). Back to basics: How evidence-based nursing practice can prevent catheter associated urinary tract infections. *Urologic Nursing*, 37(4), 204-206. <https://doi.org/10.7257/10530-816X.2017.37.4.204>
- Meddings, J., Rogers, M. A., Klein, S. L., Fakh, M. G., Olmsted, R. N., & Saint, S. (2017). Reducing unnecessary urinary catheter use and other strategies to prevent catheter-associated urinary tract infections: An integrative review. *BMJ Quality and Safety Journal*, 23(1), 277-289. <https://doi.org/10.1136/bmjqs-2012-001774>



- Mody, L., Greene, T., & Meddings, J. (2017). A national implementation project to prevent catheter-associated urinary tract infections in nursing home residents. *JAMA Internal Medicine, 177*(8), 1154-1162.  
<https://doi.org/10.1001/jamainternmed.2017.1689>
- Mody, L., Meddings, J., Edson, B. S., McNamara, S. E., Trautner, B. W., Stone, N. D., ... Saint, S. (2015). Enhancing resident safety by preventing healthcare-associated infections: A national initiative to reduce catheter-associated urinary tract infections in nursing homes. *Quality Improvement, 61*(1), 86-94.  
<https://doi.org/10.1093/cid/civ236>
- Parker, V., Giles, M., Graham, L., Suthers, B., Watts, W., O'Brien, T., & Searles, A. (2017). Avoiding inappropriate urinary catheter use and catheter-associated urinary tract infection (CAUTI): A pre-post control intervention study. *BMC Health Services Research, 17*(314), 1-9. <https://doi.org/10.1186/s12913-017-2268-2>
- Perl, T. M., Mody, L., Meddings, J., Edison, B. S., McNamara, S. E., Trautner, B. W., ... Saint, S. (2015). Enhancing resident safety by preventing healthcare-associated infection: A national initiative to reduce catheter-associated urinary tract infections in nursing homes. *Quality Improvement, 61*(1), 86-94.  
<https://doi.org/10.1093/cid/civ236>
- Revello, K., & Gallo, A. M. (2013). Implementing an evidence-based practice protocol for prevention of catheter associated urinary tract infections in a progressive care unit. *Journal of Nursing Education and Practice, 3*(1), 99-107.

<https://doi.org/10.5430/jnep.v3n1p99>

- Saint, S., Greene, M. T., Kowalski, C. P., Watson, S. R., Hofer, T. P., & Klein, S. L. (2013, March 25). Preventing catheter-associated urinary tract infections in the United States. *Journal of the American Medical Association Internal Medicine*, *173*(10), 874-879. <https://doi.org/10.1001/jamainternmed.2013.101>
- Sayhen, E., & Ozbas, A. (2018). The effect of education of nurses on preventing catheter-associated urinary tract infections in patients who undergo hip fracture surgery. *Journal of Clinical Nursing*, *27*(5-6), e0178-e1088. <https://doi.org/10.1111/jocn.14160>
- Springer, A. E., & Evans, A. E. (2016). Assessing environmental assets for health promotion program planning: A practical framework for health promotion practitioners. *Health Promotion Perspectives*, *6*(3), 111-118. <https://doi.org/10.15171/hpp.2016.19>
- Wald, H., Richard, A., Vaughan-Dickson, V., & Capezuti, E. (2012). Chief nursing officers' perspective on Medicare's hospital-acquired conditions non-payment policy: Implications for policy design and implementation. *Implementation Science*, *7*(78), 1-11. <https://doi.org/10.1186/1748-5908-7-78>
- White, K. M., Dudley-Brown, S., & Terhaar, M. F. (2016). *Translation of evidence into nursing and health care* (2nd ed.). New York, NY: Springer Publishing Company.
- Wilde, M. H. (2003). Life with an indwelling urinary catheter: The dialectic of stigma and acceptance. *Qualitative Health Research*, *13*(9), 1189-1204. <https://doi.org/10.1177/1049732303257115>

Zaccagnini, M. E., & White, K. W. (2014). *The Doctor of Nursing Practice Essentials* (2nd ed.). Burlington, MA: Jones & Bartlett Learning.

## Appendix A: CAUTI Bundle Maintenance and Compliance Tool Quiz

### CAUTI Maintenance Bundle

Department Name:

Medical Staff Involved:

Location:

Unique Identifier:

### Questions

1. Should the catheter secured to the patient's body with an appropriate secure device to prevent urethral tension?
2. Should the collection bag below the level of the patient's bladder?
3. Should the tubing from the catheter to the bag free of dependent loops?
4. Should the bag and/or tubing secured to the bed or chair to prevent tension on the system?
5. Should the bag be hanging free without touching the floor?
6. Should the patient have an individual measuring device marked with his/her name and room number?
7. Should the catheter order include an indication for the catheter use?

## Appendix B: CAUTI Bundle Maintenance and Compliance Tool Quiz

### CAUTI Compliance Bundle

Department Name:

Medical Staff Involved:

Location:

Unique Identifier:

### Questions

1. Is there an order written with indication for indwelling urinary catheter?
2. When observing nurses, did they wash their hands prior procedure start?
3. When observing catheter change, is sterile technique performed by nursing staff?
4. When observing catheter change, is the catheter properly secured?
5. When observing catheter's, is there unobstructed urine flow?
6. When observing daily cares, is there daily hygiene care documented or observed?
7. When observing staff, did the nursing staff wash their hands following the procedure?

# CAUTI Bundle Project

Diana Carlson

## Tools Used to Prevent CAUTI



## Background of CAUTI

- Healthcare associated infections (HAI) are preventable and account for an estimated 1.6 million to 3.8 million infections every year in the United States (U.S.) and 388,000 million deaths annually (Agency for Healthcare Research and Quality, 2010).
- Urinary catheters are used in LTC at a rate of five-22% and in the U.S. every facility could have 10% of their resident population with chronic urinary catheter use.
- There were 93,000 urinary tract infections in healthcare in 2011 with 75% of these infections related to urinary catheter use (Agency for Healthcare Research and Quality, 2010).
- A catheter-associated urinary tract infection (CAUTI) is a preventable HAI and is the most common HAI (Wald, Richard, Vaughan-Dickson, & Capezuti, 2012).

## Background of CAUTI

- The need to monitor, evaluate and enhance patient safety in long-term care facilities is becoming increasingly significant with approximately 1.5 million Americans living in LTC facilities and 5% to 22% of these residents requiring urinary catheter placement (Mody et al., 2015).
- Patient safety in LTC is a major focus for thousands of LTC facilities across the United States with healthcare associated infection prevention one of the most important (Krein et al., 2017).
- In 2013, the U.S Department of Health and Human Services approved a plan to focus on HAI in the healthcare setting with a focus on CAUTI's (Perl et al., 2015).
- The Centers for Medicare and Medicaid Services (CMS) announced in 2008 that HAI, including CAUTIs are no longer reimbursable by Medicare (McNeill, 2017).

## Nature of the CAUTI Bundle Project

- The CAUTI bundle is a Center for Disease (CDC) process that includes appropriate urinary catheter use, proper urinary catheter insertion, proper urinary catheter maintenance, utilizing leadership infrastructure, and a surveillance process for LTC CAUTI rates (Centers for Disease Control and Prevention, 2018).
- The focused practice questions are: 1. Does education on CAUTI prevention using a CAUTI bundle approach increase the confidence and knowledge of nursing staff? 2. Does the use of a staff educational approach, using a CAUTI bundle decrease CAUTI rates in a LTC facility?
- Using evidence-based research to develop a practice process change in LTC and change a culture of thinking will help to realign the importance of the urinary catheter placement and maintenance.
- The use of a safety program for LTC CAUTI reduction using evidence-based practice will reduce infection rates and improve safety culture through improved communication and teamwork.
- The CAUTI reduction education will also incorporate and improve hygiene practices, encourage maintenance and appropriate placement, and reduce hospital readmission (AHRQ Safety Program for Long-Term Care: CAUTI, 2014).

## CAUTI, Nursing Practice, Health Care System

- The need to monitor, evaluate and enhance patient safety in long-term care facilities is becoming increasingly significant with approximately 1.5 million Americans living in LTC facilities and 5% to 22% of these residents requiring urinary catheter placement (Mody et al., 2015).
- Everyday a urinary catheter remains in place the risk of a CAUTI developing increases 5% per day (CDC, 2018).
- Nurses play a significant role in CAUTI prevention, having the ability to be patient safety advocates. Reducing and prevention of HAI is crucial for LTC patient health.
- One of the first evidence-based preventative measures for CAUTI prevention is education on appropriate catheter use, insertion, and maintenance (McNeill, 2017).
- Urinary catheters are often used for non-critical reason or left in place by careless patient care. There are five million urinary catheters placed annually in the United States with 50% of these being not medically necessary (McNeill, 2017).
- Through staff education this number could be significantly decreased and CAUTI development potentially eliminated.





## CAUTI, Nursing Practice, Health Care System

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- Through staff education this number could be significantly decreased and CAUTI development potentially eliminated.



## CAUTI, Nursing Practice, Health Care System

- A national initiative was implemented in 2009 by the CDC. There were specific recommendations for healthcare facilities caring for patients who require urinary catheters. These recommendations included the development of quality improvement programs to monitor the new processes and measure the outcomes for effectiveness based on internal and external reporting (Gould, Umscheid, Agarwal, & HICPAC, 2009).
- The Agency for Healthcare Research and Quality (AHRQ) also implemented a change focusing on the importance of frontline nursing staff and executive leadership rounds to promote a culture of patient safety (Joshi, Ransom, Nash, & Ransom, 2014).
- The AHRQ had a goal to create and maintain a culture of patient safety that could be sustained and have continued improvements over time.

## Strategies to Address CAUTI

- Appropriate urinary catheter use: Avoid using urinary catheters in LTC for convenience to manage incontinence and there must be appropriate indications for the catheter use (Gould, Umscheid, Agarwal, & HICPAC, 2009).
- Aseptic insertion of urinary catheters: Proper training of individuals for aseptic technique for catheter insertion is recommended (Gould, Umscheid, Agarwal, & HICPAC, 2009).
- Proper urinary catheter maintenance is required: Aseptic insertion technique is recommended followed by education of urinary catheter maintenance (Gould, Umscheid, Agarwal, & HICPAC, 2009).
- Documentation, compliance, outcome measurements will be followed by internal and external reviews.
- Optimal materials for reducing the risk of CAUTI should be available at all times

## Theoretical Framework

- The conceptual framework that guided this project was Knowles' Assumption of Adult Learner. Malcolm Knowles theoretical framework has two theories of focus. The andragogy that is concerned with adult learning
- Knowles' conceptual framework believed there is a natural progression in learning from lower to higher forms with age and experience (McEwen & Wills, 2014).
- Nurses learn when developing and implementing new situations in their daily practice. New situations in healthcare encourage the nurse learner to go farther using knowledge and lifelong learning
- Knowles' believed the single most important aspect to help adult learners is to create an atmosphere of physical comfort, mutual trust, respect, openness, and acceptance (McEwen & Wills, 2014).

## Theoretical Framework

- ▶ Knowles' perspective is that adult learners need to know why they should learn something new. There are six characteristics to Knowles' learning framework:
- ▶ Adult learner's need to know why they need to learn something new.
- ▶ Adult learner's self-concept moves from being dependent to being self-directed.
- ▶ Adult learner's mature and accumulate experience that serves as a resource for learning.
- ▶ Adult learners create readiness from real-life situations.
- ▶ Adult learner's perspective changes as they mature.
- ▶ Adult learners are motivated by a desire to prove and solve practical problems.

## Theoretical Framework

Characteristics	Pedagogy	Andragogy
Need to know	Dependent on others for learning	Independent and self-directed
Self-concept	Dependent on others for evaluation	Independent for self-learning
Experience	The learner comes with little experience	The learner comes with great quality of experience
Readiness	Learners are told what to do	Change trigger readiness to learn Learners want to perform and solve problems
Orientation to learning	Learning is a process of acquiring subject matter	Learners have internal motivation
Motivation	Learners are motivated by external factors	



## Practice Setting

- The study facility is a long-term care, skilled nursing facility
- The study unit is able to provide care for 50 patient's that consist of the largest population male with few females.
- Nurses comprise the largest section of employees of study facility and the largest group providing patient care nationally.
- The nursing staff for this project consisted of men and women of varied age, educational background, and years of nursing care experience.



## Data Collection Process

- Nurses comprise the largest section of employees of the study facility and the largest group providing patient care nationally.
- The study facility employs the believe that using continued education with evidence-based information will improve patient outcomes and satisfaction.
- Catheter-associated urinary tract infection bundle education has had an impact on enhancing indwelling catheter management, decreasing the gap in nurse's knowledge, and improving the nursing staff practice (Mody, Greene, & Meddings, 2017).

## Data Collection

- The nursing staff for this project consisted of men and women of varied age, educational background, and years of nursing care experience.
- The practice-focused questions for the project included questions relating to continued education using evidence-based information about a CAUTI bundle and the sense of staff confidence with continued education. I will meet with nursing staff during unit meetings, giving them a pre and post test to determine their knowledge and confidence level in indwelling catheter care and a CAUTI approach for patient care.
- The data collection methods chosen for this project will be obtained using a power point presentation along with pre and post questions during the hands on training.

## CAUTI Bundle Maintenance Quiz

### Questions:

- Should the catheter secured to the patient's body with an appropriate secure device to prevent urethral tension?
- Should the collection bag below the level of the patient's bladder?
- Should the tubing from the catheter to the bag free of dependent loops?
- Should the bag and/or tubing secured to the bed or chair to prevent tension on the system?
- Should the bag be hanging free without touching the floor?
- Should the patient have an individual measuring device marked with his/her name and room number?
- Should the catheter order include an indication for the catheter use?
- Grading, explanation, and discussion will occur at the time of the education.

## CAUTI Bundle Compliance Quiz

### Questions:

- Is there an order written with indication for indwelling urinary catheter?
- When observing catheter change, should the nursing staff wash their hands prior procedure start?
- When observing catheter changes, should sterile technique performed by nursing staff?
- When observing patient's with catheters, should the catheter properly secured?
- When observing patient's with catheters, should there unobstructed urine flow?
- Should there be daily hygiene care documented or observed?
- Do nursing staff wash their hands following the procedure?
- Grading, explanation, and discussion will occur at the time of the education.

## Presentation of Results

- The goals for the national CAUTI rates is to eliminate this preventable infection and improve patient safety.
- The goal for this study will be to disseminate evidence-based knowledge regarding CAUTI rates and nursing staff education related to the use of a CAUTI bundle.
- The study facility has a patient population of 50 with varied health morbidities.
- The study facility, for an unknown reason had an increase in CAUTIs rates at the end of 2017 through the end of 2018.
- the LTC unit did not have recent staffing changes or patient acuity changes.



## Interpretation of Findings and Implications of Evidence-Based Practice

- Catheter-associated urinary tract infection bundle education will have an impact on enhancing indwelling catheter management, decreasing the gap in nurse's knowledge, and improving the nursing staff practice (Mody, Greene, & Meddings, 2017).
- The practice-focused questions for the project includes questions relating to continued education using evidence-based information about a CAUTI bundle and the sense of staff confidence with continued education.
- The CAUTI results will clearly demonstrate that using evidenced-based research for staff education on CAUTI prevention using a CAUTI bundle approach increase the confidence and knowledge of nursing staff and the use of a staff educational approach, using a CAUTI bundle decrease CAUTI rates in a LTC facility (McNeill, 2014).



## Impact on Nursing

- Focus of nursing care and evidence-based research exist to serve their patients (Joshi, Ransom, & Nash, 2014).
- Nurses have proven that they are a vital part in the prevention of CAUTI (McNeill, 2014).
- CAUTI prevention improves the quality of patient care, patient satisfaction, and patient well-being.
- CAUTI prevention using the CAUTI bundle creates a team approach, improving patient's health outcomes.
- The CAUTI project has introduced a robust process to bridge the gap in clinical practice, practice change, and unit culture change.

## Presentation of Results/Handout at End of Project

CAUTI Rates of Study Facility

2018	CAUTI Infections	CAUTI rate/1000 bed days of care	Urinary Catheter Days	2019	CAUTI Infections	CAUTI rate/1000 bed days of care	Urinary Catheter Days
Oct-Dec 2017-2018	2	6.06	330	Oct-Dec 2018	2	3.33	599
Jan.-March 2018	3	5.51	544	Jan. 2019	0	0	175
April-June 2018	3	4.52	663	Feb. 2019	1	6.53	153
July-Sep 2018	3	8.92	336	March 2019	0	0	132
Totals	11	25.01	1873	April 2019	0	0	152
				Totals	3	9.86	1211

## References

- Agency for Healthcare Research and Quality. (2010). Retrieved from [www.ahrq.gov](http://www.ahrq.gov)
- AHRQ Safety Program for Long-Term Care: CAUTI. (2014). [www.ahrq.gov](http://www.ahrq.gov)
- Centers for Disease Control and Prevention. (2018). <https://www.cdc.gov/infectioncontrol/guidelines/cauti/index.html>
- Gould, C. V., Umscheid, C. A., Agarwal, R. K., & HICPAC (Eds.). (2009). Guidelines for prevention of catheter-associated urinary tract infections 2009 [Entire issue]. Department of Human Health Services. Retrieved from <https://www.cdc.gov/infectioncontrol/pdf/guidelines-cauti/guidelines.pdf>
- Joshi, M. S., Ransom, E. R., Nash, D. B., & (2014). *The Healthcare Quality Book: Vision, Strategy, and Tools* (3rd ed.). Chicago, IL: Health Administration Press.
- Krein, S. L., Harrod, M., Collier, S., Davli, K. K., Rolle, A. J., Fowler, K. E., & Mody, L. (2017). A national collaborative approach to reduce catheter-associated urinary tract infections in nursing homes: A qualitative assessment. *American Journal of Infection Control*, 45(1), 1342-1348. <https://doi.org/10.1016/j.ajic.2017.07.006>
- McEwen, M., & Wills, E. M. (2014). *Theoretical Basis for Nursing* (4th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.
- McNeill, L. (2017). Back to basics: How evidence-based nursing practice can prevent catheter-associated urinary tract infections. *Urologic Nursing*, 37(4), 204-206. <https://doi.org/10.7257/10530-816X.2017.37.4.204>
- Mody, L., Meddings, J., Edson, B. S., McNamara, S. E., Trautner, B. W., Stone, N. D., ... Saint, S. (2015, July 1). Enhancing resident safety by preventing healthcare-associated infections: A national initiative to reduce catheter-associated urinary tract infections in nursing homes. *Quality Improvement*, 6(1), 86-94. <https://doi.org/10.1093/qim/qiv236>
- White, K. M., Dudley-Brown, S., & Terhaar, M. F. (2016). *Translation of evidence into nursing and health care* (2nd ed.). New York, NY: Springer Publishing Company.