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# Quality Improvement Initiative Aimed at Reducing Catheter-associated Infections and Foley Days in the Surgical Setting

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By

Linda D'Antonio

DNP Scholarly Project Committee

Dr. Mary Ellen Roberts, Chair

Dr. Teresa Conklin, DNP, RN

Charlene Ruggiero, RN, BSN

Submitted in partial fulfillment of the Requirements for the degree of

Doctor of Nursing Practice

Seton Hall University

2018

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Approved by the DNP Scholarly Project Committee:

  
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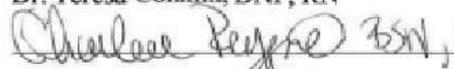
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To my twelve grandchildren, the bar was set high for me and now I pass it to you. . .  
Follow your dreams.

## Dedication

I dedicate this body of work to my parents, Raymond and Sarah Bonardi for planting the seed of education, commitment, and perseverance.

And to my husband Ed, my rock who lovingly supports me in everything I do. I am most grateful for showing me the way and especially for your gift of love.

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### Abstract

**Purpose:** This purpose of this project was to implement a quality improvement initiative focusing on reducing catheter-associated urinary tract infections (CAUTIs) in the surgical setting of Overlook Hospital Medical Center. The project looked at current literature which discussed evidence-based and best practice used in preventing CAUTIs. The literature was presented to nurses and staff in the surgical setting.

**Significance:** The significance of the project was to initiate quality improvement by teaching staff evidence-based and best practice in Foley usage and maintenance to reduce the frequency of CAUTIs.

**Methods:** This project employed the methodology of Donabedian's conceptual framework, Watson's Theory of Caring, and Lewin's Theory of Change. Interworking models were used to re-educate staff to enact change, emphasize a nurse-driven initiative, and to assess quality with achieving the overall goal of reducing CAUTIs by 50% or greater.

**Project Outcomes:** The Foley catheterization removal rate increased by 80%. There was an increased awareness of CAUTIs.

**Clinical Relevance:** Based off of the final results in the surgical setting, the project can be carried out throughout all departments and units at Overlook Hospital Medical Center.

*Keywords:* catheter-associated urinary tract infection (CAUTI), quality improvement initiative, Foley catheters, best practice, evidence-based practice

#### Definition of Terms

According to McNeill "CAUTIs, urinary tract infections (UTIs) related to the placement of indwelling urinary catheters, are caused by bacteria . . ." (McNeill, 2017). Foley days refers to the number of days a patient has a Foley catheter inserted. Foley in refers to the insertion of a Foley catheter into a patient. Foley out refers to the removal of a Foley catheter from a patient.

**SECTION I: BACKGROUND**

According to McNeill (2017), “Each year, an estimated 1.7 million patients suffer healthcare-acquired infections (HAIs) in the U.S. with 99,000 of those resulting in death” (McNeill, 2017). Catheter-acquired urinary tract infections (CAUTIs) are the second most common type of healthcare-related infections (Gould et al., 2017). Most urinary tract infections are linked to indwelling urinary catheters. Guidelines were established in 2009 and were revised in 2017 by the CDC in an attempt to reduce CAUTIs. Surprisingly, there was a 6% increase in CAUTIs from 2009 to 2013 (McNeill, 2017). CAUTIs are not reimbursable by Medicare if they are nosocomial in nature. This is a tremendous financial burden on healthcare facilities. These financial implications have made healthcare facilities increasingly vigorous to address measures that impact this concern. Data shows that 70% of CAUTIs are preventable by using evidence-based practice which could prevent around 380,000 infections per year (McNeill, 2017).

This DNP initiative had a narrow focus with the potential of project sustainability to be implemented throughout multiple areas of the healthcare facility. The facility that this project was implemented at was at a large suburban medical center in northern New Jersey. This hospital sees patients from different backgrounds for a variety of medical conditions. The population at the medical center is diverse. This project was targeted in the OR/ PACU with a concentrated population of patients being discharged from the PACU. This project was nurse-driven in which Watson’s Caring Theory was used based on values of providing quality care for patients. This project also called for a strong leadership role in which a strong presence was required at the hospital to enact and enforce change. In addition, a strong sense of collaboration was needed within the interdisciplinary teams of the medical center. The DNP role was explored in multiple presentations that were based on Lewin’s Change Theory in order to re-educate staff and nurses.

The DNP candidate role was also explored in which this project was driven and dependent on evidence-based and best practice. An extensive literature review was done to determine proper procedure and maintenance in the usage of Foley catheters. Additional information was presented to encourage the use of other alternatives in place of Foley catheters. Data was recorded over the summer to determine Foley utilization rates and the presence of CAUTI. The data collected was information on Foley days, Foleys in, and Foleys out .

### **Description of the Project**

This project is a nurse-driven quality improvement initiative with a target population concentrated on the OR/PACU units at the medical center. According to the Association of Surgical Technologies (2017), research shows that, “Urinary tract infections (UTI) are the second most common type of healthcare-associated infection reported to the National Healthcare Safety Network accounting for approximately 8 – 10 million annual visits to healthcare providers” (Association of Surgical Technologies, 2017) CAUTIs are UTIs that are developed or are associated with a urinary catheter. The Association of Surgical Technologies continues by stating that most UTIs are related to urinary catheterization (Association of Surgical Technologies, 2017). This data indicates the need for an assessment of current practices in healthcare facilities and determining the most prevalent causes of CAUTIs and implementing an initiative that targets prevention. Additionally, CAUTIs are costly and have heavy financial implications for healthcare facilities. Due to the fact that this project aimed to reduce the presence of CAUTI, it is a quality-improvement initiative. In order to fully assess the results of the data, a measurement of quality is needed to determine what can be categorized as effective quality improvement.

In order to assess quality, Donabedian's research addressing how to assess quality is used. Donabedian groups quality assessment in the following three categories: structure, process, and outcome (Donabedian, 1988). Structure is the attributes of the settings in which the care occurs which can include other resources. Process is what is done in giving and receiving care as well as recommending or implementing treatment. Lastly, outcome is the effects of care on the health status of the patient and/or populations including the degree to which the patient is satisfied with the care given (Donabedian, 1988). The project will be presented to the surgical section this semester to educate the surgical team. This team includes the surgeons, nurses, nurse managers, and educators. The background of the CAUTI issue will be presented with the literature review. This literature review encompasses the Donabedian Model which provides the framework for examining health services and evaluating quality of healthcare. Examples of evidence-based and best practice will be given. The re-education process directly affects the employees of the healthcare facility but in turn, the patient is the one who will be receiving the care.

The expected outcomes of this project are that there will be a reduction in CAUTIs and a reduction in the use of Foley catheters and Foley days. This project aims to change policy in which the staff at the healthcare facility will adopt evidence-based and best practice for caring for patients. If successful, other outcomes will include saving money for the healthcare facility that it would have spent on any CAUTI or any additional CAUTI days. The project also has long term outcomes for the healthcare facility. If staff is compliant, they will continue to educate new staff on the best and evidence-based practice necessary, increasing the longevity of the project to the new hires and patients to come.

This project involves a multi-step process for implementation. The project started out by conducting a literature review of the issue of CAUTIs and evidence-based and best practices for prevention and for care. The project was presented to the surgical staff at the medical center for approval. Next, there was a meeting with the managers to plan the launch of the project. A risk analysis was done to predict any implications that may be present to hinder the project's success. At the same time, a budget and marketing plan were developed. The budget was necessary in order to determine the amount of funds needed and how to allocate those funds. The marketing plan was also imperative as it is a crucial part in ensuring the project's success and presence. After the project was approved, a PowerPoint presentation was made to re-educate the staff on best and evidence-based practices. Staff also learned alternative methods for catheterization such as using bladder scanners, PureWick, and Tamsulosin. The next stage of the project involves implementation and recording data. At the end of the summer, the data will be analyzed in order to determine the results.

Additionally, Watson's Caring Theory was used as one of the foundational principles in the implementation and execution of this project. Watson bases her Caring Theory in everyday nurse practices. Watson believed that caring consisted of caring moments which influences other moments outside of caring. This concept was envisioned through the Caritas Process which is, ". . . the process of valuing, learning, about, and translating Watson's work in everyday nursing practice. . ." (Sitzman & Watson, 2014, p. 36). In addition, the chief principles of the Caritas Process are caring and love. By using Watson's framework, it allows nurses and other staff at healthcare facilities to be reminded of the type of work they are doing which is providing care. Watson's ideas teach nurses and other nurse practitioners the value of providing good care. Providing a good quality of care increases patient livelihood and creates a positive experience for

that patient when receiving the care. Often times, healthcare facilities can be clouded in numbers and turnover rates when simply the act of caring is not a matter of importance. Watson's framework was used in this nurse-driven initiative based off of that fact that the nurses were the primary caregivers. The nurses targeted in this initiative are ones who are involved in transferring patients from the OR/ PACU units and to post-surgical units.

### **Recipients of the Project**

A crucial component in the project's success and sustainability lies within the recipients of the project. There are two major recipients involved in this project which are the patient and the staff at the medical center. The staff at the healthcare facility was taught evidence-based and best practice using Lewin's three step change theory. Lewin's theory (1951) is known as, ". . . unfreezing, moving, and freezing" (Lewin, 1951, p. 228). This process was used to facilitate re-educating the staff at the hospital. Lewin's framework is used in the nursing environment when it involves enacting and maintaining change. In addition, the patients at the facility are also recipients of this project. The staff's care of the patients is provided directly. The project sought to enact quality change which, in turn, would directly impact the patients. The outcomes in this project were based on the goal of reducing CAUTIs by at least 50% or greater in hopes of improving the quality of care the patients received.

### **Purpose of the Project**

The purpose of this quality initiative is to reduce CAUTIs in the surgical setting. The project is geared to impact primarily the perioperative area and the post-anesthesia care unit (PACU) in the medical center. This project will focus on healthcare providers' education based on clinical practice guidelines, evidence-based practice, Donabedian's Quality Framework, and Quality and Safety Education for Nurses (QSEN).

## Goals and Objectives

The objectives of this project are:

- 1) Develop and plan the successful re-education in the use of Foley catheters at a large medical center by initiating a dialogue with physicians, managers, staff, and the research nurse.

Goal: The staff will be educated about best and evidence-based practice in the use of Foley catheters.

Actions: Several educational PowerPoints will be presented to the staff at the medical center. These PowerPoints will contain information on best and evidence-based practice when using Foley catheters. Some of the information includes the risk factors for acquiring a CAUTI and the appropriate uses for Foley catheters. Information on alternative such as PureWick, Tamsulosin, and bladder scanners will be presented.

Rationale: Staff will be aware of evidence-based and best practice when using Foley catheters. Staff will be more mindful to avoid the development of a CAUTI when using Foley catheters and can consider the use of alternatives.

- 2) Engage those involved in Foley maintenance and CAUTIs that are fully dedicated to education, execution, and evaluation.

Goal: Staff will demonstrate better understanding of Foley maintenance and be encouraged to adhere to proper guidelines when using Foley catheters.

Actions: There will be enforced presence at the medical center to influence staff.

Additionally, staff will be aware of the data collection.

Rationale: To bring the issue of CAUTIs into the forefront. The staffs' involvement in the prevention of CAUTIs will not only save revenue, but improve the quality of care.

- 3) The project will be a patient-centered approach that must assume ongoing CAUTI prevention programs.

Goal: The project will create sustainability and be carried out throughout all units of the medical center

Actions: A marketing plan will be established to increase awareness throughout the OR/PACU. Posters will be displayed and lapel pins will be handed out that state: “No CAUTIs.”

Rationale: This will make the staff conscious of the project’s goals and will serve as reminders to adhere to evidence-based and best practice.

- 4) Measure the criteria for intermittent sterile catheterization (ISC) for urinary retention.

Goal: If patients are on the OR table for 12 hours instead of leaving the catheter in, it’s less cause for infection if nurses wait until the bladder fills and let it out every 6 hours. The literature supports this; they don’t want the bladder to swell creating a need to leave them in.

Actions: Remind staff of timely Foley removal in order to prevent the development of a CAUTI.

Rationale: The duration of the insertion of a Foley catheter is one of the main causes of developing a CAUTI. When nurses remove Foley catheters in a timely manner, the rate for developing an infection decreases.

- 5) Investigate the use of Flomax (Tamsulosin) as an intervention for urinary retention.

Goal: To educate the staff about Tamsulosin as an alternative to using a Foley catheter.

Actions: This information will be included in the PowerPoint presentation which will be presented to the staff.

Rationale: To reduce the possible development of a CAUTI by using an alternative to a Foley catheter.

- 6) Re-educate staff for the proper use of bladder scanning.

Goal: To educate the staff about bladder scanners as an alternative to using a Foley catheter.

Actions: This information will be included in the PowerPoint presentation which will be presented to the staff.

Rationale: To reduce the possible development of a CAUTI by using an alternative to a Foley catheter.

- 7) Reduce the usage of indwelling Foley catheters on the post-surgical floors.

Goal: To reduce the usage of indwelling Foley catheters on the post-surgical floors by 50% or greater.

Actions: Staff will be re-educated using the PowerPoint presentations. There will be a continuous marketing campaign which will remind staff of the project's goals.

Additionally, there will be a presence in the OR/PACU to influence staff to reflect upon the evidence-based practice, best practice, and alternatives to Foley catheters.

Rationale: Preventing CAUTIs leads to less morbidity rates and allows healthcare facilities to save resources and revenue that would've had to been allocated for the development of a CAUTI.

- 8) Identify specific criteria and indicators after procedures and the necessity for keeping Foleys in place.

Goal: To reduce the development of a CAUTI and to reduce the usage of Foley catheters. Additionally, the project will establish the use of Foley catheters and for staff to be aware of when alternatives can be used in place of a Foley.

Actions: This information will be presented in the PowerPoint and conveyed to the staff in meetings.

Rationale: The staff who knows more about the criteria and indicators for Foleys will be more aware of how often they are used and why. Additionally, this can reduce the risk of developing a CAUTI.

- 9) Improve awareness within the hospital community thereby increasing reflection and learning awareness.

Goal: To ultimately reduce the presence of CAUTIs, the usage of Foley catheters, for staff to understand evidence-based and best practice, and to have the project carried out to other units of the medical center.

Actions: There will be an enforced presence at the medical center and also to gain the support from the surgeons and other staff.

Rationale: Reflection will help staff recognize areas that need improvement. Staff who is knowledgeable and confident will ultimately produce a higher quality of care of patients.

### **Phases of Implementation**

There were five phases of implementation of this project.

Phase I was the assessment of the current issue and the development of a project with a target population. This phase included collecting research and data to develop outcomes and

goals based on evidence-based and best practice. Recipients of the project were also determined in this phase by using methods to make this project a nurse-driven initiative.

Phase II was to obtain support from the stakeholders. This process included the presentation of the project to individuals at the medical center such as the research nurse, members of the CAUTI committee, the CNO, and the surgical staff and team. The project was well-received and obtained the support from the members needed.

Phase III was focused on the initial steps of implementation. The first step in the implementation of the project was targeting a population in the healthcare facility to implement the project. The OR and PACU units were the ones determined to be at the focus of this project. The second step in the implementation of the project involved organizing data from the literature review and creating informational PowerPoint presentations which were used to educate staff. These presentations offered evidence-based and best practices in Foley catheter usage and maintenance. The presentations were first presented to surgeons and committee members and after approval were presented to the staff and other nurses.

Phase IV expanded on the initial steps of implementation to ensure the success and suitability of the project. The third step of the implementation was to create a continuous marketing campaign and for the DNP student to establish a strong presence in the OR/PACU to increase awareness and demonstrate the DNP student's commitment to the success of the project.

Phase V of the project involved the fourth step in the implementation of this project which was to collect data on patients who were discharged from the PACU with or without indwelling Foley catheters and which, if any, of these patients developed a CAUTI. The plan was to collect data from three units, 6C, 7D, and 9CD at this medical center. The data was reviewed and transferred into graphs.

The final step in the implementation of this project was to analyze the data and interpret the results and discuss the findings and outcomes of the project. The findings in this project were qualitative outcomes in which the project's goal was to enact quality change at this healthcare facility.

### **Significance of the Project**

The project is significant for nursing due to the fact of the high number of CAUTIs and the high financial implications it has for healthcare organizations. In reducing CAUTIs, quality of care is increased and this leaves patients feeling satisfied. Patients will be less likely to return to the healthcare facility due to developing a CAUTI. In addition, healthcare facilities will also save money by not having to allocate resources to patients who are readmitted. Patients who are still receiving care will also be more likely to be discharged more quickly due to not developing a CAUTI and having to stay in the healthcare facility. This allocates more space in the healthcare facility and increases resources and time for other nurses. If the project is successful, it has the potential to be carried out to all units and departments at the medical center. If the results show positive effects, then other units and departments may have the potential to be just as successful. This project also serves to provide more data on CAUTI reduction programs. These results can prove to be quite beneficial to others studying this topic or to increase awareness on the burden that CAUTIs have on healthcare organizations.

Also, the significance of this project aims to change nursing practice and the quality of care administered by nurse practitioners. This is achieved through the implementation of evidence-based and best practice in Foley usage and maintenance. This project aims to decrease the length of time a Foley catheter is used or indwelling. This project also seeks to teach nurses and staff proper Foley maintenance in the scenario that would warrant a Foley to remain inserted

for a prolonged period of time. This project also aims to decrease any readmission rates due to the presence of the development of a CAUTI in patients who are discharged from the healthcare facility. The project has the potential to save the site of the project revenue and resources in the prevention of any additional resources necessary to accommodate these patients. This project has assisted the healthcare facility to be mindful of the duration that an indwelling Foley catheter is inserted into a patient. They are also taught evidence-based practice in the insertion, maintenance, and removal of any Foleys. Additional outcomes for the project show sustainability and the promise of being carried out to other units and departments.

## SECTION II: THEORETICAL FRAMEWORK & LITERATURE REVIEW

### Theoretical Framework

The theory that provided the framework for the project was Watson's Caring Theory. This theory can be further explained in Sitzman and Watson's *Caring Science, Mindful Practice*. Sitzman argues that Watson's work delivers a foundation to examine and enact caring in nursing (2014, p. 5). Watson's Caring Theory is explained through the Caritas Processes which is more of a holistic way of understanding caring theory rather than a traditional, linear approach (Sitzman & Watson, 2014, p. 7). Sitzman and Watson outline the main principles of the Caritas Process and state, "Caring and love are the most universal, tremendous, and mysterious cosmic forces. . . Often this wisdom is overlooked, or we forget, even though we know people need each other in loving and caring ways" (Sitzman & Watson, 2014, p. 36). Watson's belief stems in the principle that nursing is a caregiving profession in which nurses forget these values which Watson presents in her argument.

Watson's theoretical framework is valuable due to the fact that it places an emphasis back on the patient and the nurse or staff member who is providing the care. Watson's framework can teach nurse practitioners and other staff the meaning of caring. Watson presents an argument which focuses on the main idea that these individuals in caring environments often forget that patients need more than just "follow-ups" but rather to think of the time a patient spends in the healthcare facility as a continuous process of translating care. This framework was used in the project as it developed into a nurse-driven initiative. The project became a nurse-driven initiative based on the principle that the nurses were in charge of Foley insertion, maintenance, and removal when necessary. The nurses were primarily responsible for following procedure and removing Foley catheters in a timely manner.

Sitzman presents a concept to think about, in which the nursing profession can sometimes get in the way of actually providing the necessary care needed. Sitzman found that in her career that her practice sometimes prevented her from her full abilities to care for herself and others. This can be translated into the project by figuring out alternatives to use in place of indwelling Foley catheters. Options were explored which were designed to provide more ease of comfort as indwelling Foley catheters have been proven to be invasive and uncomfortable. Watson's Caring Theory was imperative as a basis of the project due to the DNP candidate's strong feelings on the act of giving care in the nursing profession.

In addition, Lewin's Change Theory was also used in the theoretical framework of this quality initiative project. In order to ensure the success of the project, an essential component was presenting educational presentations of evidence-based and best practices to the staff at the healthcare facility. The DNP candidate was aware that the audience was one that could be hesitant to change and new practices which warranted the use of Lewin's Change Theory to ensure re-education was going to enact lasting changes. Lewin's Change Theory involves a three-step process known as unfreezing, moving, and freezing (Lewin, 1951, p. 228). The first step, which is known as unfreezing means to target the population that the subject wants to enact change in. This step is used to start the change process by making the target population open to change. The next step, which is known as moving is the stage where the subject teaches the target population the changes he or she wants to enact. The last step, which is known as freezing is ensuring proper change management and creating sustainability in the changes made (Lewin, 1951). Lewin's theoretical framework was essential in the educational component in this project. Staff went through the process of unfreezing, moving, and freezing in order to participate in this quality improvement initiative.

## Literature Review

The project “Quality Improvement Initiative Aimed at Reducing Catheter-Associated Infections in the Surgical Setting” focuses on the best practices to reduce nosocomial infections caused by Foley catheters. Physicians, nurses, and technicians have an obligation to ensure evidence-based practice, best practice, and standards of the CDC are followed in order to minimize harm. CAUTIs are well documented in the literature, both as a quantitative issue as well as a qualitative issue. It is also noted that the concern of the CDC on this issue is in regards to best practice (Gould et al., 2017).

According to the CDC, “An estimated 17% to 69% of CAUTIs may be preventable with recommended infection control measures, which means that up to 380,000 infections and 9,000 deaths related to CAUTIs per year could be prevented” (Gould et al., 2017). As this is a project based on evidence-based and best practice, extensive research was done to find best practices for CAUTI prevention. A variety of different sources were analyzed that are best grouped into categories (1) causes of CAUTIs and best preventative measures, (2) alternatives for urinary catheterization, (3) educational practices for nurses and nursing models, (4) best quality and safety measures, (5) evidence-based and best practices for urinary catheterization.

The most useful resource in this project is the Centers for Disease Control and Prevention’s (CDC) manual, “Guideline for prevention of catheter-associated urinary tract infections.” This source is the current, regulated guidelines for preventing CAUTIs. The guidelines offer the correct procedure for urinary catheterization and criteria for catheterization and maintenance. These two factors have been shown through the research to be the most essential element in the prevention of developing a CAUTI. This source will be used to educate nurses to follow the proper protocol. The research from the project has shown that since the

guidelines have been established, there still remains a large percentage of CAUTIs that could have been prevented. In addition, this resource among others shows the primary causes of CAUTIs with an indwelling Foley catheter being one of the largest contributing factors. The literature on the best practices for indwelling Foley usage was also considered. According to the CDC, the main principles of the guidelines for prevention are:

- Intermittent catheterization is preferred to an indwelling catheter.
- Consider using bladder scanners to detect urinary retention.
- Consider using external drainage systems without urinary retention of bladder outlet obstruction.
- Proper technique for insertion and maintenance.
- All urinary catheter maintenance is to be done aseptically.
- Minimize urinary catheter use and duration in all patients particularly those who may be at a higher risk for nosocomial infection.
- The indicators for catheterization usage which includes gynecological surgery and urological surgery. Patients anticipating to receive large volume infusions and/or diuretics during surgery with intraoperative monitoring of output.
- The monitoring of outputs and patients requiring prolonged immobilization, ex: spinal or multi-trauma injuries or potentially unstable thoracic or lumbar spinal implementations (Gould et al., 2017).

Much of the research shows that indwelling Foleys are being used too often and almost at times carelessly. A large concern is to determine if the use of an indwelling catheter is even necessary. The two largest contributing factors for CAUTI development are the contamination of bacteria and the duration of the placement of an indwelling catheter. Most indwelling catheters

are not necessary due to being relied on for incontinence or nurse convenience (McNeill, 2000). This is definitely an area to consider when re-educating staff. If a CAUTI reduction program is going to succeed, nurses and staff must be educated on the criteria which would necessitate the need for an indwelling catheter. Additionally, literature looking at alternatives to indwelling Foleys was also included in the research.

Alternatives to indwelling Foleys were reviewed and were determined to be quite effective in CAUTI reduction programs. The research showed that methods such as bladder scanners proved to be useful in detecting urinary retention. In the use of bladder scanners, it eliminates the need for catheterization, furthermore decreasing the potential development of a CAUTI. It was determined to be much more sanitary and less invasive than using indwelling Foley catheters. In addition, recent research on options for females were reviewed which included the PureWick. The PureWick is a female external catheter (Newton, Call, & Chan, 2016). More information about the PureWick was studied as it proved to also be an effective alternative to urinary catheterization (Newton, Call, & Chan, 2016). In this project, the use of PureWick was not included. Additionally, options such as male external condoms or “Texas catheters” were also considered. Further research into Flowmax (Tamusolin) and Intermittent Sterile Catheterization (ISC) was also considered as the project progressed. Another important aspect of the literature research included gaining information on nursing models which drove the project into nurse-driven direction.

As the project progressed, the need to reestablish criteria in the objectives calling for a more nurse-focused initiative was determined to be the right course of action. A great deal of the literature for the project focused on studying nursing, current practices, and nursing models and conceptual framework. Lewin’s Theory of Change was also referenced to use for re-educating

nurses and staff. Literature showing research for practice models for nurses and focusing on performance outcomes were also reviewed to understand best practices. This research also includes Watson's Theory of Caring, in which she focuses on self-caring which starts with implementation from the nursing staff. This led to a discussion of looking for how to improve quality care leading to Quality and Safety Education for Nurses (QSEN). QSEN provided evidence-based nursing practicum which focused on several components of nursing healthcare. This research will be crucial in the implementation of the project.

### **SECTION III: METHODOLOGY**

#### **Approval Process**

The implementation plan was approached in a step-by-step method. The approval process involved launching the concept of the project with the research nurse, the DNP student's preceptor, managers of the OR (perioperative) and the PACU. The CNO of the medical center was the focus of the launch. A literature review was discussed with the CNO and research nurse who gave their complete support in pursuing the project. An education plan was developed to re-educate nurses and staff at the project site.

Informatics technology (IT) and nursing informatics assisted with the integration of a program that captured the number of clients leaving the PACU/OR with a Foley catheter. This data was collected during a six week period. The data was compared to the same criteria during a six week period prior to re-education. This data was analyzed, reinforcing the indication for the project. The data and a formal presentation including PowerPoints were given to outline the scope of the problem, available evidence, practice guideline recommendations, and patient advocacy. Nurse-to-physician communication was given to the surgical section of physicians, the appropriate committee, risk management, and infection control. An in-service of the project was presented as a campaign to the perioperative/ post-OR staff. That group included the OR, PACU nurses, and technicians.

#### **Phases of the Project**

##### **Phase I: Needs assessment.**

The project was started on the basis of a passion for quality improvement. In According to Lo et al. (2015), "Urinary tract infection (UTI) is one of the most common hospital-acquired infections; 70%–80% of these infections are attributable to an indwelling urethral catheter" (Lo

et al., 2015). This data indicates a need for a prevention program in order to reduce the risk of developing a CAUTI due to an indwelling catheter. Lo et al. continue to discuss that the most important risk factor in developing an infection is the duration of catheterization (Lo et al., 2015). This research indicates the need for a CAUTI prevention program focused on timely removal of indwelling catheters. Foley catheters are useful in healthcare settings due to the ease of use. However, a huge problem occurs in this setting. Nurses are opposed to removing Foley catheters because it requires more care. Nurses work in a fast-paced environment and some find it easier to empty the bag rather than having to monitor patients using the restroom or offering the toileting. In addition, most of the literature shows that even though the duration of the Foley catheter is the major contributing cause to developing a CAUTI, other causes include existing disease conditions, the physical condition of the patient, older age, not maintaining a closed drainage system, and different types of bacteria that can accumulate (Association of Surgical Technologies, 2017). Additionally, guidelines from the CDC were published detailing proper infection control measures. This literature in addition to other studies on CAUTIs was looked at to determine a plan of action in the implementation of this project.

### **Phase II: Obtain support from stakeholders.**

The research nurse and the CNO at the healthcare site gave their total support in the pursuit of this project. The next step after the launch and approval of the project was to present the data to other staff at the medical center which was crucial to the project's success. The presentation of the project was approached in a method that would use the author's status as an established peer to help influence staff. The PowerPoint presentations detailing evidence-based and best practice in addition to guidelines and other data were presented to the surgeons of the OR and PACU floors. The surgeons' support was an imperative factor to dictate the project's

momentum. This was done in an effort to avoid one of the risks identified in the SWOT analysis conducted. A major risk of the project's success was nurse and staff resistance to change which would be the implementation of the project. The surgical team supported the project and presentations were then given to other nursing staff to the OR and PACU units.

**Phase III: Initial implementation steps.**

The author spent time on-site to ensure the project maintained a strong presence. Data collection was programmed for the project by the informatics team at the medical center to capture data for six weeks prior to and post educational sessions. This data reflects how many patients had a Foley catheter removed prior to leaving the PACU and how many patients left the PACU with the Foley catheters in.

From the commencement of the project, learning objectives were refined for the educational plan. These include (1) evidence-based practice and how it relates to standards of care and patient outcomes, (2) the unintended effects of indwelling catheterization for a long duration of time (longer than 24 hours) and the impact on nosocomial infection rates and quality indications, (3) data collection that recommends a change in practice, and (4) the significance of inter-professional collaboration in achieving improvements in the delivery of care.

A budget was established to estimate the financial feasibility of this project. Multiple factors were considered in the creation of this budget. The resources needed for this project included educational materials for the re-education of the staff, refreshments, and cards. In addition, funds for the marketing campaign were included. Travel cost and the employees' salaries were also calculated. The costs of continuing education and orientations of new hires were also considered. The success and sustainability of this project also relied on a strong and influential marketing campaign.

The marketing campaign was consistent with the institute's mission statement of designing and delivering high quality, innovative, and personalized healthcare to build healthier communities and improve the lives of patients, consumers, and caregivers. This mission statement is also applicable to the use of Watson's Caring Theory in the implementation of this project. The healthcare profession contains the word "care" which implies the necessity of enforcing caring values and principles that Watson demonstrates in her caring theory. The authenticity of the project and the caring-healing through changes are reflected in Watson's Caritas (Sitzman & Watson, 2014). The project has accentuated that this has been a nurse-driven initiative and the caring was administered by the nursing staff. The marketing campaign executed a plan to increase awareness of the project and to help enforce the project's goals and objectives. The campaign consisted of lapel buttons that stated "No CAUTIs" which was crossed through, posters, and large banners that hung in the doctors' rooms. The marketing campaign was a continuous effort to help influence the staff to implement the project's initiatives.

#### **Phase IV: Ongoing implementation.**

After data was collected for a period of six weeks, weekly educational sessions were scheduled. They were scheduled on different dates and times to accommodate various shifts, schedules, and departments. The education campaign was marketed and promoted with the support of the unit manager and the nursing administration. The marketing campaign included banners, lapel pins depicting "NO CAUTIs", and PowerPoint presentations were given to the physicians, nurses, and technicians from the perioperative and postoperative units. The response to the campaign was positive and enthusiastic. A team of 92 professionals from the pre-op and postoperative care attended. During the educational sessions, the focus was on evidence-based and best practices in addition to evaluating the decision to remove the Foley in the PACU based

on evidence for preventing CAUTIs. Ongoing implementation of the project included the author continuously reinforcing her presence in the perioperative and PACU areas. The author dedicated over 130 on-site hours to this project in addition to six staff meetings, and three committee meetings which included the CAUTI committee. This process included the continuous implementation of the marketing campaign, the collection of data of Foleys in and out prior to education, and the collection of data of the presence of CAUTI days pre and post-education. The implementation of the project occurred from the time period of July to September in 2018. After the educational presentations, nurses and staff implemented the project. The author frequently visited the site to continue to maintain a strong presence and influence as an established peer. The marketing campaign was also a constant factor in the ongoing implementation of the project. Banners and posters with the project's message were displayed and lapel buttons were used as well. Data on Foleys in and out and CAUTI days were collected pre and post-education. The initiative was focused on the OR and PACU floors focusing on floors 6C, 7D, and 9CD.

**Phase V: Project evaluation.**

In patient care, a process that facilitates continuous improvement is central in practice to an environment that produces a change in practices, which are patient-centered and focused on care, that is both evidence-based and of high quality (Denisco & Barker, 2013). A major benefit to the hospital in this project is if the initiative is successful, the hospital will reduce costs. Data shows that readmission rates are a financial burden to healthcare organizations. A (2016) study by Scanlon centralized on a CAUTI reduction program focusing on the ICU was done at North Shore University Hospital which showed that CAUTIs decreased by 46% and 89%, while catheter days decreased by 22% and 58%. In addition, there was a 46% cost savings over the

time period equating to \$62,396 and an 89% savings over 18 months with a value of \$119,866 (2016). This study was done over a 12 month period and had a significantly positive financial impact.

The steps in quality management which are monitoring and evaluation processes are based on the work of William Edwards Deming. Deming is an American author and professor consultant who is best known for his work in producing manufacturing production effectively during World War II. Deming believes that quality is founded on continuous improvement of processes and that when work is focused on quality, costs decrease over time (Deming, 1986). An important aspect of the project is that it is a quality initiative. By increasing quality of care, costs are expected to decrease. This includes saving the use of resources allocated to CAUTIs causing patients' readmission into the hospital and the costs associated with caring for that patient including antibiotics, time, and other resources.

In retrospect, re-educating the surgical staff to change behaviors and protocol by awareness of evidence-based practice and best practice will result in fewer CAUTIs and Foley days. The effectiveness of this project will be determined by seeing a monthly reduction in reports reflecting the number of CAUTI days and the number of Foley days. The endurance and success of this project are also dependent on sustaining education of current staff and future hires. This is evident in how best practice evolves. Successful implementation of this project and results showing a reduction in these two factors create sustainability for the project. If the project is successful, this leads to the potential of having the project expanded to the rest of the hospital units. This project can create positive long-term results for healthcare professionals, healthcare providers, and for patients.

**Data Collection**

Before the educational sessions, the data collected showed 174 patients with Foley catheters were admitted to the PACU. Upon discharge from the PACU, 51 Foley catheters were removed (*Appendix A*). 29% of Foley catheters were removed before discharge.

After the educational sessions, the data collected show that 181 Foley catheters were in place upon admission to the PACU. Eight of those were exempt from data due to the fact they met the criteria for indicators during surgery. 173 Foley catheters were in place after removing indicators as per the CDC guidelines. Upon discharge, 138 Foley catheters were removed and 43 of them remained in place (*Appendix B*). The findings show an 80% removal rate.

The total Foley days for the post-operative units during the month of July prior to the educational sessions were 6C = 52, 7D = 70, 9CD = 105. The total Foley days for the post-operative units during the month of August post-educational sessions were 6C = 36, 7D = 78, 9CD = 99. Data for post-education shows there were no CAUTIs during the month of August.

**SECTION IV SUMMARY****Project Sustainability**

This project shows that a CAUTI prevention program does have the potential to decrease rates of CAUTI while increasing the rate of timely Foley removal. This quality initiative was successful in improving the quality of care given to the patients at the healthcare facility. In addition, this project proved that Lewin's Change Theory can be effectively utilized in order to teach current staff at healthcare facilities evidence-based and best practice. Nursing plays an essential role in being knowledgeable about proper Foley maintenance and assisting in the prevention of CAUTIs.

The increasing professional and media campaign in the United States to achieve better healthcare and outcomes are a key factor to this project. The amount of crucial quality issues is extensive and institutions are eager to achieve sustainable improvements and outcomes. The achievement of delivering high quality care is never subsidiary, but rather in need of a calculated or strategic plan that will ensure culture changes that will pervade to the entire system. While nursing leaders are well aware of pressing national quality issues, bedside nurses and other team members may lack information and are superficially informal. Expectations of performance placed on the staff has been increasingly growing, creating a demanding environment where best practice is achieved by critical thinking and high-level decision making.

According to the CDC guidelines,

“Virtually all healthcare-associated urinary tract infections are caused by instrumentation of the urinary tract. CAUTI has been associated with increased morbidity, mortality, hospital cost and length of stay. In addition, bacteriuria commonly leads to unnecessary antimicrobial use, and urinary drainage systems are often reservoirs for multidrug-resistant and a source of transmission to other patients” (Gould et al., 2017).

The suspected lack of awareness regarding the use of Foley catheters and their alternative substitutes are supported by scientific data. The financial impact of nosocomial infection caused by the use and duration of Foley catheter use has brought CAUTI prevention to the forefront of healthcare. Many quality indicators such as deficient interdisciplinary communication and inadequate assimilation of assessments that determine protocols are areas that predict and promote practice guidelines. This produces an unacceptable disparity between evidence and practice.

## **Conclusion and Recommendations**

CAUTIs are preventable complications of hospitalization. Using Lewin's Change Theory in conjunction with Watson's Caring Theory, the project was able to target an interdisciplinary team which included the CNO, the research nurses, the infection and CAUTI committee and the on-site team of doctors, nurses, techs and informatics specialists. The ultimate goal of the project was to develop an awareness of the need for catheterizations and the alternatives that are available. Early engagement combined with a targeted educational session led to a decrease of patients leaving the PACU without a Foley. There was an 80% removal rate prior to educational session with a 33% rate of patients that left the PACU.

This is an accumulation of Watson's Caring Theory in everyday nursing practices. Watson believed that caring consisted of caring moments which influence other moments of caring. It is envisioned through the Caritas process which to reiterate is, "The process of valuing, learning about, and translating Watson's work into everyday nursing practice" (Sitzman & Watson, 2014, p. 36). Watson's framework allows nurses and other interdisciplinary healthcare providers to be cognizant of the quality of care to their patients. This has been at the core of the development and implementation of this project.

This project was implemented in the surgical area. It would behoove those accountable for quality improvement to take this project further to other arenas such as interventional radiology, emergency departments, and medical units. Educational sessions of this project should be recommended to be included in the orientation bundle of new hires and continuous educational sessions should be implemented. Another important recommendation that came out of this project was utilizing informatics and their team to track Foleys on admission and removal upon discharge. This could be expanded to any unit and/or department.

Lastly, supportive nursing leadership is a vital characteristic for reducing adverse clinical events and promoting team vitality. The evolution of transformational change is cognizant at the practice site and can be attributed to strong executive nursing leadership. Hospital protocols and guidelines should make adjustments to meet standards for evidence-based and best practices.

On a larger scale, recommendations can prevail beyond the institution's site. Exposure of this issue at regional, national, and scholastic conferences is suggested to promote widespread awareness of this quality issue. At no time in the history of medicine has the growth in knowledge and technologies been so profound. It is highly recommended that the pace is kept with quality of care across the spectrum of nursing during these transitional times.

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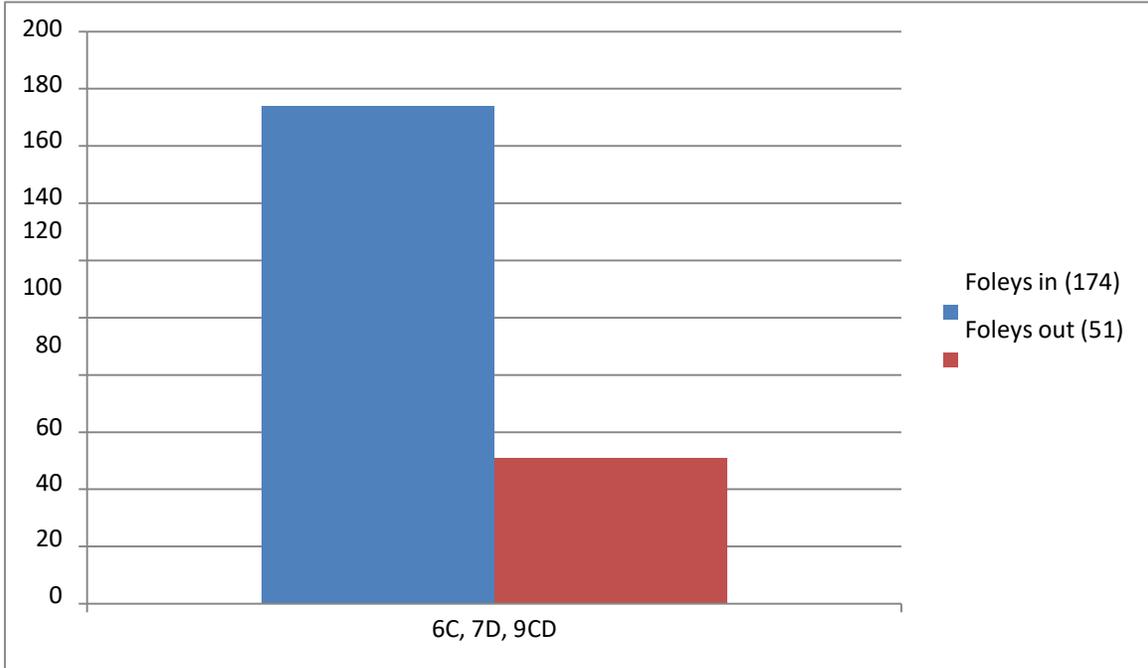
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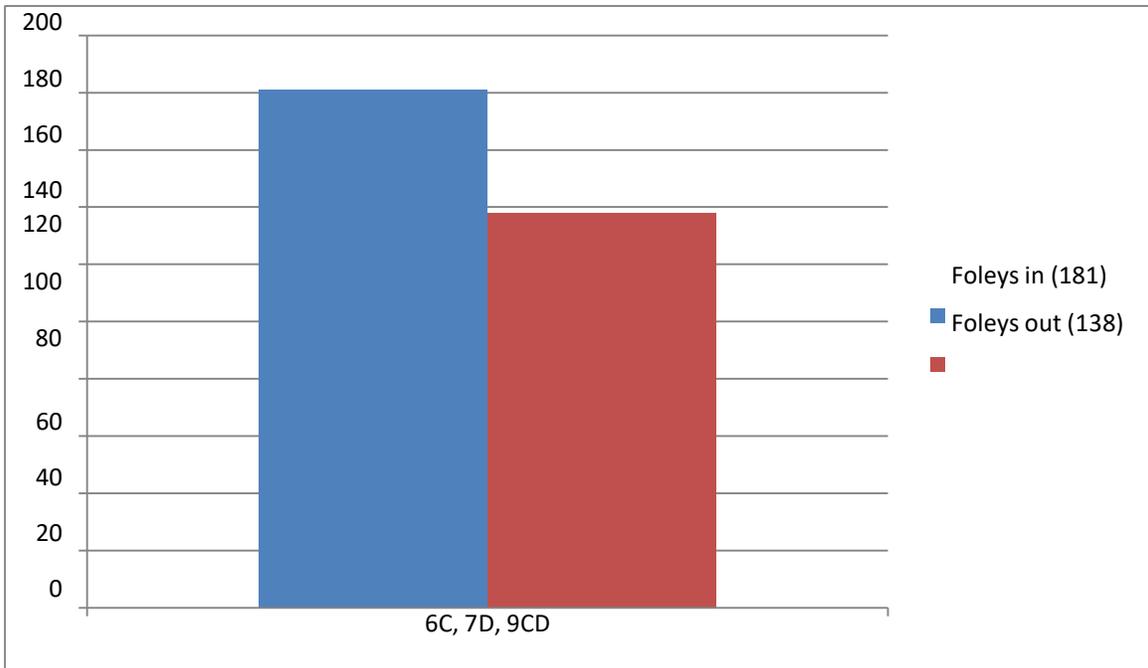
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**Appendix A: Foleys in/out pre-education**



**Appendix B: Foleys in/out post-education**



Appendix C: Total Foley days

