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Understanding and Prevention of Catheter Associated Urinary Tract Infections (CAUTIs)

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The hospital-acquired infections (HAI) cause a significant burden to healthcare. HAIs increase the cost of healthcare in addition to increasing patients' morbidity and mortality rates. Among all the HAIs, catheter-associated urinary tract infections (CAUTIs) are most common and account for more than 30% of all hospital-acquired infections (American Nurses Association,2015). On estimate, about 560,000 patients develop CAUTIs in the hospitals, which lead to the increase in length of stay, increase in the cost of healthcare, and decrease in patient satisfaction (ANA, 2015). The author chose to complete a project in her department with a goal of decreasing or eliminating CAUTIs. The department consists of a 34-bed med-surgical unit with the adult patient population mix of oncology, surgical, and cardiac patients. In this paper, the author will address the project's clinical leadership theme, statement of the problem, project overview, methodology, data source and literature review, timeline, expected results, and nursing relevance.

Clinical Leadership Theme

The Clinical Nurse Leader (CNL) project titled "Understanding and Prevention of Catheter Associated Urinary Tract Infections (CAUTIs)" aims to improve the staffs' knowledge and understanding related to CAUTIs, including prevention, and elimination through the use of the American Nurses Association (ANA) CAUTI prevention tool (Appendix, A). This supports the author's goal of decreasing or eliminating CAUTIs in her department. The CNL role in the project is to function as an educator and outcomes manager, which serves as the foundation for the project. The CNL competencies are to "participate in a shared leadership team to make recommendations for improvement at the microsystem level and evaluate the efficacy and utility of evidence-based care delivery approaches and their outcomes" (American Association of

Colleges of Nursing, 2013, p. 11). First, the process is to evaluate the staffs' current competencies and knowledge regarding the urinary catheter indications, insertion, care, and management. Second, the process is to identify, design, and implement curriculum to enhance staffs' knowledge on adherence to current practices. During this process, the CAUTI Task Force will be developed. The purpose will include assisting in collecting data, performing group meeting, designing the education materials, implementing interventions, and evaluating the project's outcomes. Lastly, the process is to evaluate the effectiveness of the implemented education, tools, and practices with the aim to achieve the following outcomes: (1) enhanced staff knowledge about CAUTIs, (2) staff adherence to the implemented the ANA CAUTI prevention tool, and (3) maintained CAUTI rate below benchmark. Furthermore, the project will significantly improve patient quality of care, patient satisfaction, and hospital cost. This aligns with the global aim of the project, which is to prevent and/or eliminate all hospital-acquired infections including CAUTIs.

Statement of the problem

In adult patients admitted to the medical-surgical unit who are at risk for hospital-acquired CAUTI, how does evidence-based the ANA CAUTI prevention tool decrease the CAUTI incidences in medical-surgical unit compared to similar adult patient population nationwide. The unit currently utilizes the ANA CAUTI Prevention Tool; however, the rate of CAUTIs continues to increase, which warrants a root-cause analysis of the current practices hence the selection of this topic for the project. The current CAUTI rate for the medical-surgical unit is 1.52 for year 2017 which is above the national benchmark through National Healthcare Safety Network (NHSN). The project goal is to decrease or eliminate CAUTI rate on the unit by 54% for 2018 to bring the rate below the benchmark. The author identified the gap in the staffs'

knowledge and understanding how to utilize and apply the ANA CAUTI prevention tool as well as the variation in practices among staff. She believes that appropriate education plan is needed to close the gap in knowledge as well as to have the processes in place to evaluate gaps and address challenges and barriers to sustain the practices in place. The success of the project will be rolled over to the other units in the hospital with the ultimate goal of prevention of CAUTIs to provide quality patient care and increasing patient satisfaction.

The project is based on a 34-bed medical-surgical unit in a community-based hospital in the northern California. The medical-surgical unit staff include nurses, patient care technicians (PCTs), therapists, ward clerks, hospitalists and nursing students. Typically, each shift consists of 5 -6 nurses including a charge nurse, 3 PCTs, 3-4 therapists and a ward clerk. The number of students ranges from 5-6 a day and students' clinical instructor. As a community-based hospital, the hospital is bustling on day to day basis with about 8-10 in-patient elective and emergency surgeries. The patient population is a mix of oncology, surgical and cardiac patients with the significant number of elderly patients. The majority of patients with Foley catheters come from intensive care unit. There is a significant correlation between duration of the indwelling catheter to the chance of developing CAUTI. Each additional day increases the likelihood of developing CAUTI by 3% to 10% (Connor, 2018).

The project goal is to reduce and eliminate CAUTI occurrences on the med-surgical unit by increasing the staff knowledge and understanding related on how to appropriately utilize and apply the ANA CAUTI prevention tool to improve patient outcomes. It is estimated that hospital-acquired conditions increase the healthcare cost by 33 billion in addition to being a threat to patient safety (American Nurses Association, 2015). The project success and achievement of goals will help prevent penalty to the hospital through hospital-acquired

condition (HAC) reduction program mandated by the Affordable Care Act. The Centers for Medicare & Medicaid (CMS) is required to reduce payments by 1% for hospitals ranking among lowest-performing 25% hospitals concerning hospital-acquired conditions. CMS organizes patient safety indicators in domain 1 and national healthcare safety/healthcare-associated infections in domain 2 to calculate HAC score. The domain 2 weighs 75% as compared to domain 1 which considers 25% to calculate HAC score (Centers for Medicare and Medicaid, 2017). The HACs not only causes payment penalty as well as it negatively affects the reputation of the hospital.

Project Overview

The first step is the data collection for the project that started with the development of CAUTI task force. The task force includes the unit manager, charge nurses, a nurse, a CNA, infection nurse, and educator. The infection prevention department provides the task force with data on infections in the previous year with a detailed analysis of the patient stay. The analysis includes the admission date, department, in-patient transfers, date, and location of catheter insertion, length of stay, total catheter days, bacteria determined, treatment and discharge. The hospital reports information to the National Health Safety Network (NHSN) from Centers for Disease Control and Prevention(CDC). CDC mandates reporting of all hospital-acquired infection to the NHSN for tracking the of the infections. The data from the NHSN is used by CMS to determine HAC score as previously mentioned in the introduction. The infection prevention department after analysis of the data reports this information to risk analysis department for the hospital network for tracking the infections. The data provides information on the current CAUTI rate, national benchmark and hospital penalties due to CAUTIs. The stakeholder analysis (nursing staff, patients, and nurse manager) is also conducted as part of the

root-cause analysis. The stakeholder analysis includes the point of view of the frontline care staff and patients to add the different perspectives and to make them part of the project. The stakeholder analysis makes it evident that actual practices are far from established policies/procedures. The assessment makes it apparent that current practices, knowledge base of the staff regarding CAUTIs and the usefulness of ANA tool is minimal. The stakeholder analysis addresses the lack of education to staff as the primary factor contributing to CAUTIs and warrants for the need of the project (Appendix B).

The next step is to inform the unit staff regarding the objectives of the project, expectations and potential achievements. The objectives of the project are (1) the assessment of the knowledge base of the team and ways to prevent CAUTIs, (2) increase the staff knowledge on ANA CAUTI prevention tool. The specific aim of the project is to bring CAUTI rate on the unit below the national benchmark. The global aim is to eliminate hospital-acquired infections including CAUTIs at all (CDC, 2018). The global aim of the project is a mirror image of the specific aim as it focuses on elimination of hospital-acquired infections including CAUTIs through staff education on ANA CAUTI prevention tool. A survey tool(questionnaire) was created for the staff (Appendix C) to understand the knowledge base of the staff regarding CAUTI, current policies and ANA CAUTI prevention tool. The staff was given the questionnaire during shift start huddles. The charge nurses were educated first regarding the purpose of the questionnaire. The charge nurses surveyed huddles to catch all the staff. The output of the questionnaire survey helped the CAUTI task force to develop educational material for the staff on ANA CAUTI prevention tool.

The CNL and Nurse Educator will present the education material to the staff in the form of power-point slides, reading handouts and interactive classes. The CNL will develop one-hour

informative mandatory sessions and simulation classes for March, June, July, and August. Each presentation will focus on definition, signs, potential complications and associated treatment options. Each presentation will end with a short quiz with incentives for participation (Appendix D) to reinforce the learning. The quiz itself sometimes can be tedious. The staff will be engaged in discussion over the results and other options to enhance the teaching. The shift change huddles will focus on a quick discussion regarding evaluating the effectiveness of the education provided and changes seen in the unit as result of the teaching. Another part of the mandatory in-service will be one-one simulation classes for the staff to reinforce the education provided. It is an advanced way in which the skills can develop. As per the report from Institute of Medicine, simulation helps with development and retention of skills (Aebersold, 2013).

The goal of the project is specific as it aims to reduce the CAUTI rate on the unit. The success of the project is measurable at the end through data collection on CAUTIs, chart reviews, staff knowledge analysis, and simulation class. It is relevant to needs of the unit as the current CAUTI rate for the unit is above the national benchmark which highlights the need for the project. The project has time limits-the time frame of the project is from February to June and is a time-limited project. The above criteria explain that the project has SMART goals (Revello and Fields, 2015).

Methodology

Rationale

The root-cause analysis is a method that helps identify the underlying problems through system approach. It is structured approach as it looks at all possible factors that lead to the identified problem (AHRQ, 2017). During our group meetings, the CAUTI Task Force identified the potential risk factors contributing to the high incidence of CAUTIs. The risk factors can be

categorized into four categories such as human factors, environmental factors, administrative factors and material factors. The human factors such as lack of initiative from nurses to request for removal of the catheter, the communication failure of communication between physician and nurses to address the indication for continuity of catheter, lack of knowledge are the major factor towards the increase in CAUTI rate on the unit. The environmental factors can include smaller rooms making harder to maneuver equipment to start the bladder training program, time voids and early ambulation to stimulate bowel and bladder. The workload for each nurse, lack of support staff such as a relief nurse, and lag time in removal of catheter despite the order serves as environmental factors towards CAUTIs.

The administrative factors are the lack of training regarding the ANA CAUTI prevention tool, lack of follow up from the education department, and lack of training to newly hired staff. The temporary traveler nurses with potential less willingness to learn and implement also contribute to CAUTI rate on the unit. Material factors of the lack of appropriate supplies include different size catheters as per recommendation from the ANA CAUTI prevention tool, shortage of catheter care supplies, and catheter securement supplies. The shortage of appropriate urinals such as female urinals also contributes as the material factor towards CAUTI rate on the unit (Appendix E).

The SWOT analysis of the unit indicates the presence of highly educated & skilled staff with willingness and open-mindedness to learn as strengths of the unit. The staff understands the needs and benefits of the project. The opportunities of the project include the decrease in CAUTI rate, increase in patient satisfaction, and enhancement of staff knowledge/skills. This will also prevent hospital penalties from CMS under the value-based purchasing program. The weaknesses of the microsystem to the implementation of the project are the fast turnover of staff

on the unit. The turnover leads to floating staff, travelers and staff from other units from time to time to cover the shortage. The inconsistency of staff reduces the staff compliance to implemented policies and protocols and lacks the willingness to learn. The resistance of some staff, constraints of time and non-compliance are some of the potential threats to project (Appendix F).

The stakeholder analysis makes it evident that actual practices are far from established policies/procedures. The assessment makes it apparent that current practices, knowledge base of the staff regarding CAUTIs and the usefulness of ANA tool is minimal. The staff lacks the understanding of the role of the tool algorithm, indications, and appropriateness of size of the catheter in the prevention of CAUTIs. It also, indicates the inconsistencies in care, lack of training, lack of information on ANA tool as part of new hire orientation and lack of follow up. The fragmented communication and lack of follow-through are also identified in stakeholder analysis. The ANA tool even though is part of policies but the gap in staff knowledge and care warrants the need for the project.

Cost Analysis

The literature research on cost gives us an estimate that CAUTIs cost about $340 million every year (National Healthcare Safety Network, 2009). It is estimated that CAUTI patient has an average of 2.4 increase in their length of stay (LOS) which increases the cost by $7200 per CAUTI (Gaudie, 2015). It is clear that each additional day costs about $3000. As per the report from hospital's risk analysis department, there were 6 cases of CAUTI on the med-surgical unit last quarter which presents an additional cost of $43,200 to the hospital per quarter.

The cost of the project will be considerably low as this project will be started as a small project with minimal input and once established will be rolled over to other units. The budget

input towards the project is insignificant as compared to the money that hospital will be saving from preventing CAUTIs. The estimated salary for the CNL is $ 65/hr as per Bureau of Labor Statistics. The time spent by CNL on project development, education and evaluation will be approximately around 150 hours. The cost for the CNL input will be $ 9,750. The unit nursing staff consists of 39 registered nurses full time/per-diem and 20 certified nursing assistants. As per Bureau of Labor Statistics, the average salary for RN is $ 55/hr and for CNA is $ 22/hr. The mandatory one hour for in-service for nursing staff for March, April, May, and June will cost about $ 5,170. The estimated cost of supplies such as paper, printing ink and posters will cost about $ 1000 for the project.

Even after the cost of implantation for the project, the potential saving for the quarter will be around $27,280. By implementing this tool, the institution will be able to save approximately $43,200 each quarter through reduction and elimination of CAUTI rate on the unit. (Appendix G).

Change Theory

Changes are always tricky, but the power of education drives change. Educating staff regarding the current ANA CAUTI prevention tool will be difficult to accomplish due to multiple factors such as fear, resistance, etc. Kotter's change theory has been utilized in the planning process to bring and establish change on the medical-surgical unit. Kotter's eight-step change theory (Kotter and Cohen, 2012) will help connect staff to need, communicate the change and anchor the change as a culture of the unit. The steps of change model include creating a need of urgency, team development, vision creation, communication of vision, empowerment of actions, the celebration of small successes, and not giving up and adhere changes to unit culture (Kotter and Cohen, 2012).

The author presented the CAUTI data to the staff during daily huddles, employee engagement board, and unit meetings to develop a sense of urgency to the unit. The CAUTI task force also presented the data to management to discuss the need for the project and action plan. The team development empowers the staff, increases participation and develops a team approach to the problem. The education department, nurse manager, and charge nurses voted for CAUTI task members from the unit. A staff nurse and CNA are included in CAUTI task force as frontline patient care providers. The next step of vision creation help staff understand the problem and be motivated to be part of the creating change (Kotter and Cohen, 2012). The staff feedback regarding the current issue during huddles, lack of current practices regarding the ANA CAUTI prevention tool and the potential cost of healthcare helped develop a vision among the unit staff. The communication of the view to the team helps bring everyone on the same page and increase participation (Kotter and Cohen, 2012). The CAUTI task force uses an employee engagement board to discuss the progress of the project to the unit staff. The CAUTI task force has weekly engagement through huddles, by asking the team for feedback, suggestions, and ideas to incorporate into the project to maximize participation. The CAUTI task force presents the staff with the timeline, the progress of the team, and celebrate the small successes. The CAUTI task force has incorporated the number of days without any CAUTI on the engagement board to celebrate the victory with the staff. The employee engagement board will help sustain the change to the unit with the continuous engagement of the team.

Data Source/Literature Review

The Aim statement of the project is to decrease the rate of CAUTIs to improve patient safety and reduce associated healthcare burden. The PICO statement utilized to find literature for the CAUTI project identifies the problem (P) as the lack of understanding and compliance of

nursing staff regarding CAUTI prevention tool. The interventions (I) are the assessment of nursing staff knowledge, RN training on the ANA CAUTI prevention tool and, adherence of nursing staff to established policies. The comparison (C) is with the CAUTI rate with the national benchmark to check the effectiveness of the interventions. The outcome (O) is the decrease in CAUTI rate on the unit below the national benchmark.

The literature search is related to CAUTI prevalence, the financial impact of CAUTIs, complications related to CAUTI and the ANA CAUTI prevention tool. Initially, the search was dominated by interventions, but later the search was narrowed down by dividing the topic by definition, financial impact and interventions to prevent CAUTIs. The definition part defines the CAUTIs and associated complications. Since, the hospital system is currently under the ANA CAUTI prevention tool, the author focused the search on the ANA CAUTI prevention tool. The author used university library database for evidence-based literature reviews such as CINHL, Pub-med and Agency for Healthcare Research and Quality (AHRQ) to get evidence-based articles regarding the ANA tool. The author also did additional google research to find more relevant articles.

Trevellini, (2015) demonstrates the strategies to incorporate the ANA CAUTI prevention tool into nursing practice in a study at Saint Francis Hospital, New York. The author identifies clinical decision making, indications, and nurse role as crucial factors of the ANA CAUTI prevention tool to help prevent CAUTIs. Smith (2015) in another article demonstrates the role of CAUTI prevention tool in the decrease of CAUTIs in a 140 bed Community medical center over a period of 2 years. The implementation of the evidence-based ANA CAUTI prevention tool accounted for 94% nurse compliance and the significant decrease in the rate of CAUTI in the hospital.

Blondal et al., (2016) assessed the effectiveness of implementing evidence-based recommendations in the reduction of catheter-associated urinary tract infections (CAUTIs) through prospective cohort study in a major referral university hospital. The sample size includes (n=244) patients with data collection before and after the implementation of interventions during a 1-year period. The interventions are based on the alignment of the knowledge base of doctors and nurses on catheter indication and short educational sessions for nursing staff on evidence-based practices on catheter usage. The author concludes the significant improvement in current practice through short educational interventions. Saint et al., (2013) performed a national comparative study on the effectiveness of implementation of evidence-based recommendations with a sample of U.S. hospitals and all Michigan hospitals with a total of 470 infection preventionists as participants. The author indicated the role of preventative practices, catheter reminders and nurse-initiated discontinuation of the catheter in the prevention of CAUTIs. The study reported 25% reduction of CAUTIs in hospitals in Michigan state.

Yatim et al., (2016) through a pre-post study design in a Singapore hospital and Mori (2014) with a retrospective chart review study demonstrates the role of nurses and the nurse-driven protocol on the early removal of the catheter. Tizon (2015) also identifies the importance of the nurse role in catheter maintenance and timely removal of crucial factors in the reduction of CAUTI in the ICU at Saint Joseph hospital in Colorado. Barbadoro et al.,(2015) presented the importance of hand hygiene in prevention of CAUTIs. The most common antibiotics isolated were Escherichia coli, Pseudomonas aeruginosa and Klebsiella pneunoniae that are resistant to different classes of antibiotics. The authors aimed to highlight the importance of aseptic technique and hand hygiene in CAUTIs prevention.

The goal of the project is to decrease or eliminate CAUTIs through two significant interventions: a) understanding the knowledge base of the staff regarding the CAUTIs and current policies b) educate staff on the ANA CAUTI prevention tool. The understanding of staff is determined from an anonymous quiz during shift change huddles. The quiz will be kept anonymous to increase staff participation without the fear of judgment and retaliation. The results will serve as the basis for designing the education material for the staff regarding the evidence-based ANA's CAUTI prevention tool. The education will also enhance staff knowledge on catheter care.

The staff attainment and retention of knowledge will be tested from a quiz at the end of the mandatory in-service. The goal is to have staff result of 95% and better for staff at the end of compulsory in-service. The simulation is not graded but will enable staff to apply critical thinking that will enhance their knowledge. The in-service will be incorporated into new hire orientation as a 2-hours mandatory training with 1-hour education and 1-hour simulation training.

Timeline

The project starts in January 2018 and is expected to finish in July 2018 under current circumstances. In January, 2018 the project starts with identification of problem through data received from the 'Risk Analysis Department' regarding the CAUTI rate on the med-surgical unit with detailed analysis of admission date, department, transfers, date, and location of catheter insertion, length of stay, catheter days, bacteria determined, treatment and discharge. The first month of January consists of development of CAUTI task force and assessment of knowledge of the staff to determine the gap in knowledge and patient care through weekly meetings and shift change meetings. In February, 2018 the focus is towards the development of teaching material

for in-service and simulation class through bi-weekly meetings. During March-June 2018, one-hour in-service and simulation classes for the staff to cover the whole staff will occur. The in-services are scheduled to finish in the month of June. The project is moving at its expected timeline without any lag so far. In July, 2018 the CAUTI task force targets to audit and evaluate implemented interventions. The quarterly audits will be conducted be the infection prevention nurse and risk Analysts (Appendix H).

Expected Results

The expected results from the implementation of the project are the development of an understanding of the ANA CAUTI prevention tool to achieve the goal to reduce or eliminate the CAUTI rate on the unit. The staff understands the need for the implementation of the project. The hurdles to implementation have also been identified, but the participation of team, unit manager, and education department can help develop trust. The in-service class has been a great success. The review of the quiz at the end of the class shows the result of 90% and higher. The staff presented an excellent understanding of the education provided.

After participation in the first in-service staff members are already showing motivation and trust in the change and are willing to learn more. Staff huddles are helping in the communication of the vision to staff and keeping them aware of the project timelines. The nursing board in the staff room is being used to post information regarding the project's supplies, schedule, and interventions. The nursing station, staff room doors, and bathrooms are used to display laminated copies of the tool and current policies. The purpose of this is to provide easy accessibility and reinforcement. The unit nurse manager has been very supportive in keeping the unit aware of progress and assists with the schedule of in-services.

Nursing Relevance

CAUTIs are costly for the hospital and patient as well and causes unnecessary discomfort to patient/families (Panchisin, 2016). Prevention of CAUTIs is beneficial for staff, patients and families as well. Nurses have an essential role in the prevention of CAUTI, and other hospital-acquired infections as frontline clinicians. It is not possible without effective communication with physicians, staff and other disciplines involved in care. Nurses with their skills of assessment, screening, and implementation of appropriate interventions can help prevent inappropriate use short-term indwelling catheters. The elderly patients can have severe complications from CAUTI such as Sepsis due to co-morbidities. The success of the project will help enhance knowledge of nurses towards CAUTI, screening, and ANA "CAUTI Prevention Tool." The nurses will have the better understanding of their role in the prevention of CAUTI and improve patient outcomes. The project will have a significant contribution to nursing skills, autonomy and knowledge base. CNL role as Educator and Outcomes Manager is crucial to the success of the project as the CNL role through their knowledge bring a higher level of expertise and competence for the nursing staff (AACN, 2013).

Summary Report

The project named Understanding and Prevention of Catheter Associated Urinary Tract Infections aims to decrease and eliminate the CAUTIs through the development of educational in-services and simulation labs from January-July/2018 in a 34-bed medical-surgical unit. The project will empower nursing staff in understanding the nursing role in CAUTI prevention and application of ANA CAUTI prevention tool to current clinical practices. The leadership team aims to achieve the objectives of (1) the assessment of the knowledge base of the team and ways to prevent CAUTIs, (2) increase the staff knowledge on ANA CAUTI prevention tool.

The CNL with education department will provide education to staff in the form of mandatory 1-hour in-service and 1-hour mandatory simulation lab. The staff attainment and retention of knowledge will be tested from a quiz at the end of mandatory in-service (Appendix D). The goal is to have staff result of 95% and better for staff at the end of compulsory in-service. The simulation, even though is not graded but will enable staff to apply critical thinking and will enhance their knowledge. The in-service will be incorporated into new hire orientation as two hours mandatory training with one-hour education and one-hour simulation training. The project aims to integrate this education and simulation lab as part of new hire orientation to incorporate the understanding of ANA CAUTI prevention tool from the beginning.

The project status is in progress. The evaluation plan includes data collection, data analysis, and data comparison. The CAUTI incidences will be measured and collected by infection control daily audit tool explicitly created to CAUTIs. The infection control nurse will be responsible for obtaining this information. Data analysis includes Catheter days, indications, and compliance with ANA tool will be measured through chart review by CAUTI task force and infection control daily audit. The risk analysis department will compare the data to evaluate the quarterly trend and address barriers. The data will help evaluate the reduction in CAUTI rate and staff compliance with ANA CAUTI prevention tool. The data will be provided to staff through employee engagement board for the transparency of the success of the project. Evaluation of staff compliance will be performed through annual skill assessment class for nursing staff.

The project will be sustained through (1) stakeholders' support, (2) CAUTI task force involvement, (3) by using ANA CAUTI prevention tool appropriately, (4) providing continuous education support, (5) address barriers and challenges and (6) staff recognition. The hospital mission to "enhance the well-being of people through excellence in healthcare services (Sutter

Health, 2017)" coincides the CNL project. The frontline nursing staff can make the most difference through sound knowledge of CAUTIs, current practice guidelines, and ANA prevention tool. Additionally, the communication of benefits of CNL project to quality patient care, hospital's reputation, and financial impact is significant; will enhance stakeholder and organizational support.

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Appendix A
American Nurses Association CAUTI Prevention Tool

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

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

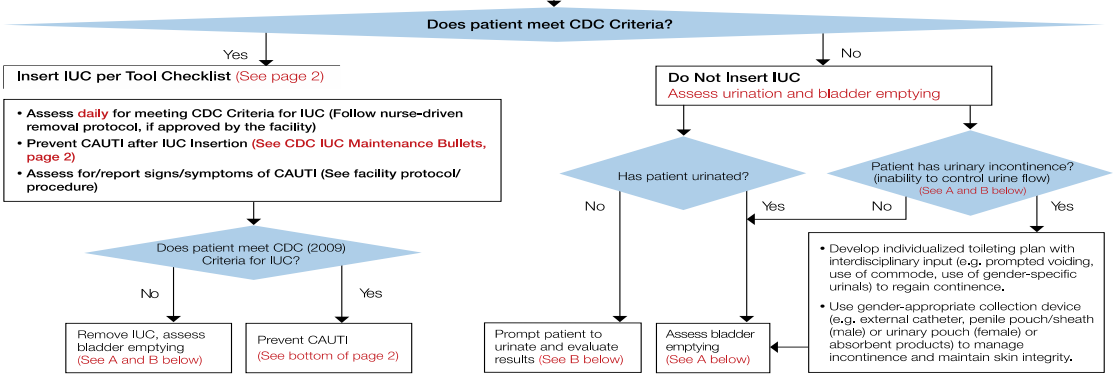
Key Practice Strategies to Reduce CAUTI: 1) Fewer Catheters Used, 2) Timely Removal and 3) Insertion, Maintenance and Post-Removal Care.

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

BOX 1

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

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



Assess for Adequate Bladder Emptying

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

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

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

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

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

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

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

BOX 2

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

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

References

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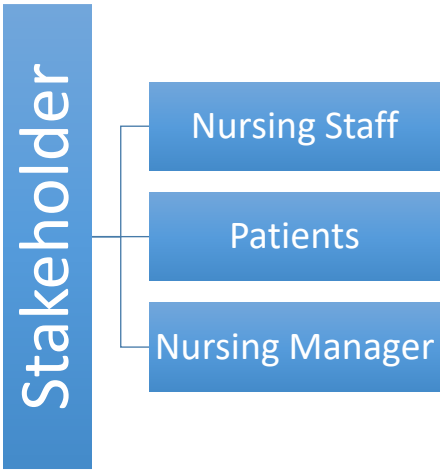
Appendix B
Stakeholder Interview



Interview:

1. What are hospital acquired infections and who do you think is responsible?

2. Who is affected the most due hospital acquired infections such as catheter associated urinary tract infections (CAUTIs) and how?

3. Does the hospital get penalized due to hospital acquired infections and how?

4. What steps can be implemented to prevent infections?

5. Do we have any current policies and procedures to prevent CAUTIs, If, yes, where can be find them?

6. What will be benefits of implementation CAUTI prevention project?

7. How can be implement this project and what do you think will be hurdles and benefits of the project?

8. What suggestions and questions do you have for CAUTI task force to achieve goals of the project?

Appendix C

Nursing staff Catheter Associated Urinary Tract Infection (CAUTI) understanding and Prevention Quiz

The sole purpose of the quiz is to understand the staff knowledge base regarding CAUTIs and prevention strategies, "CAUTI prevention tool" based on American Nurses Association (ANA) tool. The quiz will be kept anonymous and will not judge anyone character/skills.

1. Define the CAUTIs and its etiology.

2. What are strategies to prevent CAUTI and what tool are we using currently?

3. Does staff play an important role in prevention and if yes, how?

4. Do you know the algorithm and prevention tool to prevent CAUTI? Please define.

5. What is current catheter care policy, and how is responsible for catheter care and how often?

6. Where would you rate yourself on CAUTI understanding and adherence and why?

7. Where would you rate your unit staff on catheter understanding and why?

8. What do you know about current CAUTI rate for your unit?

Appendix D
Mandatory In-service After Quiz
CAUTI

1. Define CAUTI and three associated signs and symptoms.

2. Give three examples on CDC criteria for indwelling urinary catheter insertion.

3. What is catheter care and who is responsible for catheter care?

4. True or False. It is only responsibility of physicians to assess the indications for indwelling catheters.

5. True or False. Hand hygiene is not required after peri-care.

6. True or False. The pre-inflation of balloon is not recommended by ANA “CAUTI Prevention Tool”.

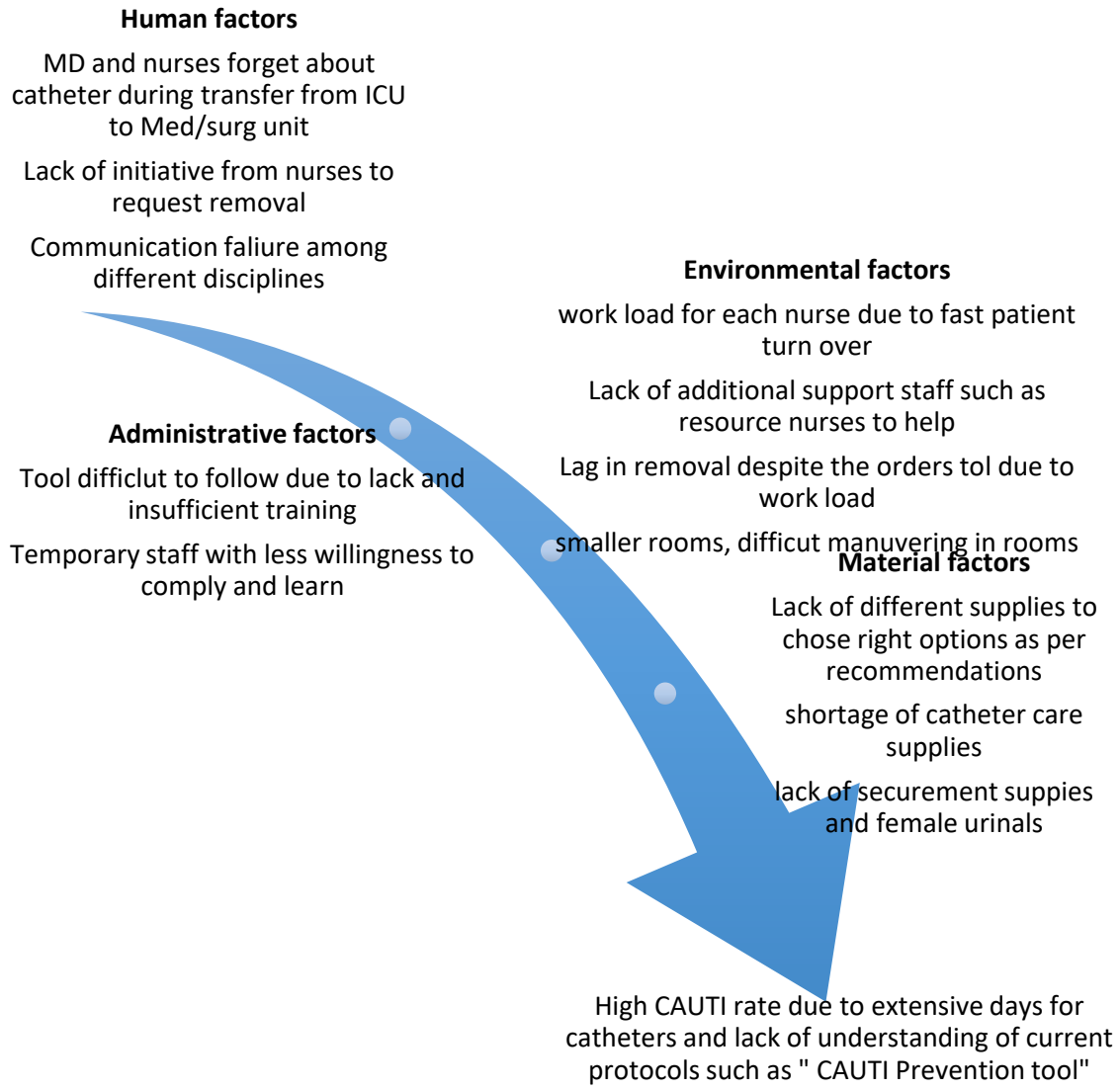
7. What is bladder emptying?

8. What is recommendation of ANA “CAUTI Prevention Tool” regarding the bladder scanning and straight catheterization?

9. List three recommendation of ANA “CAUTI Prevention Tool” on maintenance of catheters.

10. What is the recommendations from ANA regarding the selection of indwelling urinary catheter?

Appendix E
Root Cause Analysis



Appendix F
SWOT Analysis

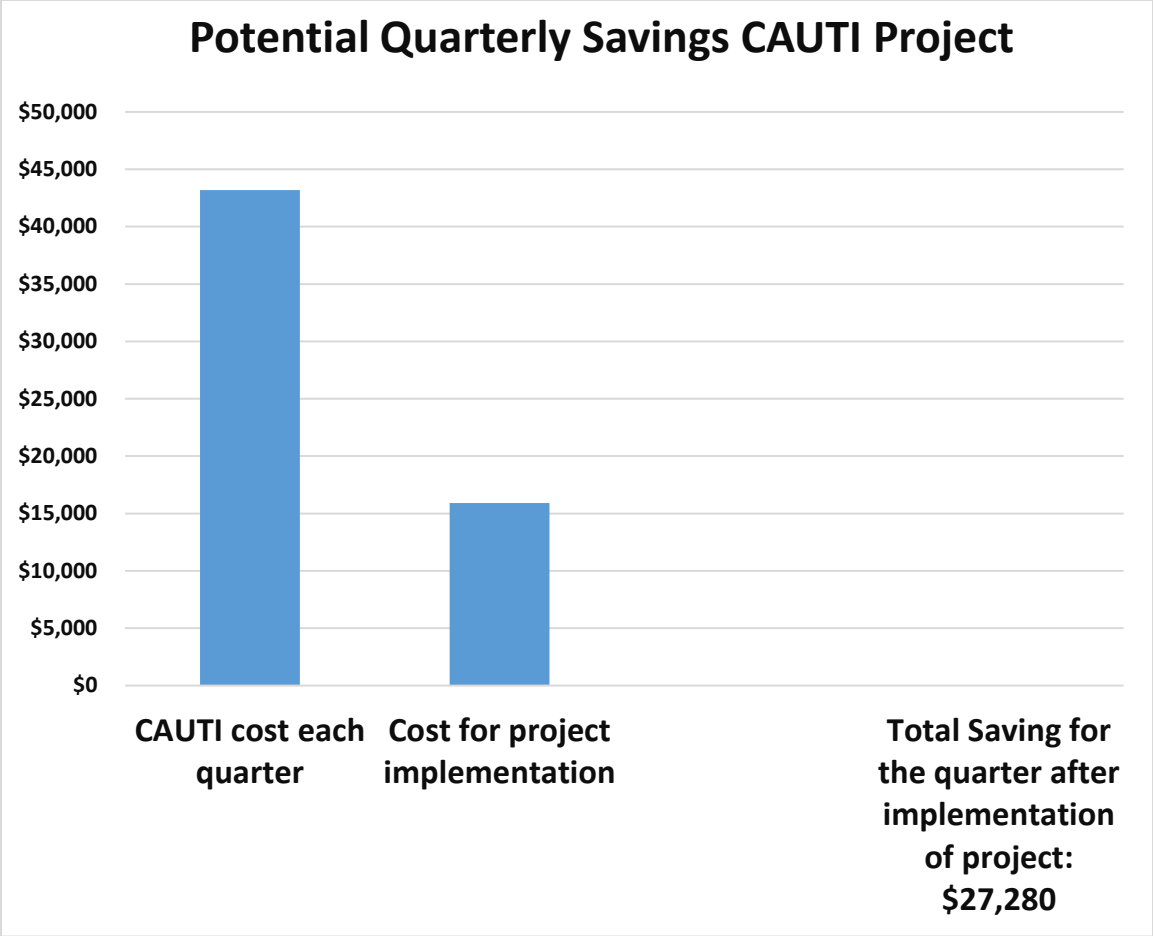
Appendix G
Cost Analysis

Estimated cost for CAUTI (length of stay)

Average increase in length of stay	Estimated Cost for 2.4 patient care day	Estimated daily cost for each patient care day
2.4 patient care day	$ 7200	$ 3000

Cost for implementation of project

Total number of staff	Estimated cost of two hour in-service	Total estimated cost
39 RN + 20 CNA	($55x39 + $20x22) x 2 RN- $55/hr CNA-$ 22/hr	$5,170
1 CNL Hours for project-110	$ 65X150 hours CNL-65/hr	$9,750
	Ancillary charges	$ 1000
	Total cost:	$ 15,920



The project will save the institution around $43,200 each quarter.

Appendix H
Timeline

Tasks	January	February	March	April	May	June	July
Development of task force							
Assessment of staff knowledge base							
Development of education material/review of policies							
In-services and simulations							
Evaluation