

Catheter Associated Urinary Tract Infections

Linda Duong

Lakeview College of Nursing

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Sasha Hollman, MSN, RN, CENP

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### **Catheter Associated Urinary Tract Infections**

Centers for Disease Control and Prevention (CDC) (2021) states that urinary tract infections (UTI) are the most common type of healthcare-associated infection reported. Among the UTIs acquired in the hospital, 75% are due to a urinary catheter, and 15-25% of hospitalized patients receive urinary catheters during their hospital stay (CDC, 2021). Urinary catheters are tubes inserted into the bladder through the urethra to drain urine; thus, the most critical risk factor for developing catheter-associated urinary tract infection (CAUTI) is prolonged use of the urinary catheter. To classify an infection as a CAUTI: a patient must have had an indwelling urinary catheter for more than two days, one sign or symptom including fever, tenderness, urinary frequency, urgency, or dysuria, as well as urine culture with more than one bacterial species (Letica-Kriegel et., 2019). The significance of CAUTI's is that they can lead to more severe complications like sepsis and endocarditis. It is estimated to have over 13,000 deaths each year associated with healthcare-associated UTIs (Letica-Kriegel et., 2019). Quality and safety education in nursing (QSEN) competency includes patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics (James et al., 2017). CAUTI's related QSEN competency relates to patient-centered care and safety regarding reducing and preventing the likelihood of hospital-acquired infections (James et al., 2017).

Centers for Disease Control and Prevention (CDC) (2021) defines urinary tract infections (UTI) as common infections that happen when bacteria enter the urethra and infect the urinary tract, including the urethra, bladder, ureters, and kidneys (Parker et al., 2017). CAUTI risk increases with the duration of catheterization and generates care burden and hospital costs (Parker et al., 2017). In many instances, indwelling urinary catheter insertions are unjustified or

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inappropriate, causing significant patient distress, discomfort, pain, and activity restrictions (Parker et al., 2017). Parker et al. (2021) state that CAUTI is the most preventable hospital-acquired infection with the potential to save hospital costs. A common component to reduce urinary catheter is timely catheter removal. Studies show that healthcare education from clinicians is a crucial intervention to address catheter use and CAUTI. By combining practice guidelines with staff engagement, education, and monitoring, data shows an increase in patient outcomes, and CAUTI can be reduced (Parker et al., 2017). This article relates to the care of concern by emphasizing the importance of avoiding inappropriate urinary catheter use and CAUTI during hospitalization. Parker et al. (2017) explain that patient-centered care and patient safety influences safe practices and regulations regarding catheter use and in-depth evaluation of clinical practice and changes.

CAUTI's association with increased morbidity, mortality, length of stay in the hospital, and higher hospital costs for patients and the healthcare systems has amplified over the years (Mitchell et al., 2017). Studies have shown a lack of documentation and evidence about the genital cleaning solution used prior to catheter insertion systems (Mitchell et al., 2017). To justify the most effective cleaning solution, chlorhexidine use before catheterization will reduce bacteria (Mitchell et al., 2017). Appropriate urinary catheter insertion procedures will decrease the risk of CAUTI in hospitals by reducing bacterial colonization around the genital areas (Mitchell et al., 2017). Based on the QSEN competency, patient-centered care and safety were emphasized in this article to evaluate the effectiveness and cost-effectiveness of antiseptic and non-antiseptic genital cleaning agents to prevent CAUTI in hospitalized patients. Despite medical advances in infection prevention and control, catheter-associated are still problematic and remain common in hospitals. This research study addresses the gap in infection control

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regarding CAUTI and how efficient research and practice will demonstrate a decrease in hospital cost and mortality rates. Mitchell et al. (2017) emphasize the prevention of healthcare-related CAUTI leading to patient safety benefits.

Removing an indwelling catheter as soon as possible is the most effective way to prevent CAUTI. Practical strategies to prevent infection are training healthcare workers appropriately when it comes to catheter protocols. Meneguetti et al. (2019) state that healthcare workers need to have active surveillance of CAUTI incidence, use the appropriate technique for the insertion and the maintenance of the catheter, and remove the catheter as soon as it is not clinically necessary. One of the leading obstacles in removing an indwelling urinary catheter is the perception of healthcare workers insisting that patients with severe conditions need to use the device to drain their bladder (Meneguetti et al., 2019). Studies show that promoting the implementation of protocols in the clinical setting with clear criteria for the indications of using indwelling urinary catheters will change from perception-based to evidence-based practice (Meneguetti et al., 2019). To promptly evaluate the impact of removing indwelling catheters, Meneguetti et al. (2019) suggest healthcare workers enroll in an educational program and create a daily checklist when working with indwelling catheters and their indications among critical patients. When referring to the QSEN competency, patient-centered care and safety are relevant because educating healthcare workers and daily evaluations of indwelling urinary use showed a long-term reduction of CAUTI among critical patients admitted to a general intensive care unit (Meneguetti et al., 2019).

The duration of catheterization is the most crucial factor of bacteria forming; CAUTI risk increases by 3% to 7% each day after placing an indwelling urinary catheter (Flores-Mireles et al., 2019). Short-term urinary catheterization increases the risk of developing CAUTI and other

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complications up to 80% (Flores-Mireles et al., 2019). In comparison, prolonged catheterization can increase the risk to almost 100% (Flores-Mireles et al., 2019). CDC recommends minimizing urinary catheter use and duration, particularly those at higher risk for CAUTI or mortality from catheterization, such as women, the elderly, and patients with impaired immunity (Flores-Mireles et al., 2019). To prevent CAUTI, the CDC suggests reducing unnecessary indwelling urinary catheters and encouraging prompt removal, ensuring proper adherence to general infection control principles such as hand hygiene, aseptic insertions, and catheter maintenance (Flores-Mireles et al., 2019). By complying with these guidelines, these interventions appear to be low cost, low risk, effective and sustainable to the patient and healthcare system according to the QSEN competency of patient-centered care and safety.

CAUTI is a preventable healthcare-associated infection nationally. Andrade and Fernandes (2016) state that healthcare professionals play a key role in reducing CAUTI and interventions which target their behavior in delivering optimal patient care. Health professionals can follow guidelines of proper catheter use and present implementation methods to avoid infections while using the device during hospitalization. Research indicates that simple initiatives such as hand hygiene, use of reliable techniques, maintenance, and the removal of the catheter can contribute to preventing the associated infection (Andrade & Fernandes, 2016). The main strategies of implementing guidelines for proper catheter use include proper insertion technique, assessing the necessity of the urinary catheter, and implementing bundles (set of intervention based on evidence to clients at risk during their hospitalized care) (Andrade & Fernandes, 2016). Strategies found by nurses to respond to hospital-acquired infections were effective by providing interventions based on evidence and promoting the evaluation of urinary catheterization necessity, and removing the catheter when not necessary can reduce the CAUTI rate. This article

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relates to the QSEN competency by improving the quality of patient-centered care and safety of the person who seeks health services in the hospital (Andrade & Fernandes, 2016).

The patient has suffered from a recurrent CAUTI since 2009 despite the healthcare facility's attempt to prevent infections (Magnusson et al., 2019). The objective of the case study was to analyze the catheterized patient with bladder dysfunction (Magnusson et al., 2019). The patient was permanently catheterized with an indwelling catheter and experienced frequent CAUTI symptoms requiring antibiotic treatment (Magnusson et al., 2019). Research indicated the location of the bacteria was in the patient's urine paired with fever, malaise, fatigue, pyuria, pain in the urinary bladder, and urgency (Magnusson et al., 2019). As the infection risk increases with the catheter placement duration, the patient switched to the NMA and hydrogel-coated BIP Foley Catheter in 2013 (Magnusson et al., 2019).

The type of care setting the patient was in during this case study was in the urology department of the Central Hospital, Karlstad, Sweden (Magnusson et al., 2019). Each monthly visit was an evaluation point, which included catheter exchanges and microbiology testing at the hospital (Magnusson et al., 2019). The precipitating circumstance that promoted the suggested change was that the patient had reoccurring CAUTI for several years with antibiotics as the only treatment (Magnusson et al., 2019). With a provider's order of a permanent catheterization, reducing the recurrent CAUTI was a primary intervention. The outcome of the current process was the substitution of her traditional type catheter for a BIP Foley Catheter with an NMA coating due to better comfort and less pain during catheter exchanges (Magnusson et al., 2019). Due to the implementation of the change, the perception of change by the staff was cheerful and supportive because this change helped the patient reach optimal health to sustain her life. By continuously monitoring the patient and assessing her routinely, this outcome led to improved

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quality of life for this patient and suggested that CAUTI events need proper treatment through patient assessment.

Synthesis of nursing implications practice, education, and research for CAUTI include preventing infection and identifying potential risk factors that can affect urinary tract infections. Nurses play an essential role in following hospital guidelines such as: maintaining hand hygiene, training infection prevention control for all hospital staff, and removing catheters before seven days (Letica-Kriegel et., 2019). After extensive research, this student determined that the best-preferred nursing practice for CAUTI is to improve appropriate catheter use, aseptic catheter placement, and routine maintenance care. Meddings et al. (2017) state that prompting the removal of unnecessary catheters, hand hygiene, barrier precautions, infection control strategies, and interventions to improve antibiotic use will decrease the likelihood of CAUTI occurrences. Interventions include staff education about catheter management and facility-wide program to ensure catheterization only when indicated and prompt removal of indwelling catheters when caring for hospitalized patients (Meddings et al., 2017). Current guidelines for educating staff about patient care or nursing practices related to CAUTI are implementing educational modules on preventing hospital-acquired infections during orientation, training healthcare workers on strategies and protocols to reduce infection, and enforcing infection control guidelines in facilities (Kakkar et al., 2021). Other guidelines include limiting the use and duration of urinary catheters and using the aseptic technique for catheter insertion (Kakkar et al., 2021). Staff and healthcare professionals should follow these guidelines to ensure patient safety and reduce the chances of hospital-acquired infection during hospitalization. Nurses play a significant role in patient care concerning promoting health and well-being, preventing diseases, and healing the community. The priorities for further study from a nursing clinical perspective are that there

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should be more research on how nursing interventions and healthcare professionals can eliminate the risk for CAUTI collectively. Research gaps that correspond with how long a foley catheter should be inserted during a hospitalization stay. More research will contribute to a significant improvement in patient experiences and health care outcomes in the hospital (Parker et al., 2017).

Nurses and healthcare professionals play a significant role in patient care concerning promoting health and well-being, preventing diseases, and providing healing care to the community. CAUTI is a healthcare-associated severe infection due to the prolonged use of the urinary catheter. CAUTI can lead to complications like sepsis and endocarditis if not treated promptly. By combining practice guidelines with staff engagement, education, and monitoring patients with indwelling catheters, CAUTI rates may decline in the future.

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