

Reducing risks of catheter associated utis



Catheter associated urinary tract infection (CAUTI) is the most common health care associated infection within hospitals (Department of Health (DH), 2003), so it is important that nurses know how to reduce infection risks and manage the care effectively to improve patients outcomes. This essay is a scenario-based the case study. The aetiology and patho-physiology of CAUTI will be addressed. Nursing problems and nursing interventions in relation to a patient who had an indwelling urinary catheter will also be discussed.

Mrs M is an 82 years old lady who has non-insulin dependent diabetes. She was originally admitted into the hospital due to a fall at home, which fractured her left femur. As a result, her mobility was impaired. Post-operatively, an indwelling urinary catheter that was inserted during the surgery was left in situ and she was transferred to a rehabilitation ward for rehab. While she was staying at this ward, preventing CAUTI was an important part of her nursing care. The infection control measures, especially good hand hygiene practice were undertaken by the nurses throughout her care.

A urinary tract infection (UTI) is an infection of any part of the urinary system. The urinary system is a filtering system that comprising the kidneys, ureters, bladder, and urethra to make and excrete urine. Correspondently, there are two types of UTI: lower UTI that includes the bladder (cystitis) and urethra (urethritis); and upper UTI that involves the kidneys (pyelonephritis) and the ureters (ureteritis) (Clinical Knowledge Summaries (CKS), 2009a). Thus, upper UTIs are potentially more serious than lower UTIs because there is a possibility of kidney damage.

UTIs are mostly caused by bacteria, especially *E. coli*, which is normally found on the skin around the bottom and comes from the bowels (O'Connor, 2002). According to MERCK (2007), in hospitalized patients, *E. coli* accounts for about 50% of all cases, which followed by other gram-negative organisms. However, evidence suggests that yeasts and gram-positive organisms such as coagulase-negative staphylococcus and *Enterococcus* species are also common in catheterized patients (Billote-Domingo et al, 1999).

Most of the time, human body can get rid of these pathogens, but certain conditions increase the risk of having UTIs. The presence of a urinary catheter is one of the major risk factors. The longer a catheter is in place, the higher the risk of infection (Pratt et al, 2007). Other predisposing factors include: being female, diabetes, older age, urinary retention, bowel incontinence, and immobile. Additionally, when there is pre-existing condition(s) such as a catheter or diabetes that predispose to the increasing risk of spreading infections to the kidneys, the UTI is considered as complicated (CKS, 2009a). Therefore, it is not difficult to understand that Mrs M was susceptible to a complicated UTI and preventive measures need to be taken by the nurses as an important part of her holistic care.

The most common route of UTIs is ascending infection from urethral infection, or introduction of microorganisms directly into the bladder via urethral, such as on catheterization (O'Connor, 2002). Under normal conditions, despite the distal urethra is frequently contaminated by colonic microorganisms, the whole urinary system is normally sterile and resistant to the colonization (Naish and Hallam, 2007). The natural defence mechanisms

that maintain this sterility status include urine acidity, emptying of the bladder at micturition, ureterovesical and urethral sphincters, and various immunologic and mucosal barriers (MERCK, 2009). However, the insertion of a urinary catheter provides a pathway for pathogens to enter the bladder either through the catheter lumen or from around the outside of the catheter. A biofilm normally forms around the outside of the catheter and on the uroepithelium that may protect the already entered pathogens from the natural defence mechanisms and antibiotics, which makes elimination of the pathogens difficult (Madeo and Roodhouse, 2009). Thus, if untreated, a low UTI upwards spread may cause damages to the kidneys or septicaemia, which can be fatal.

Once the infection is established in the body, it activates the inflammatory response, which causes the symptoms of UTIs. The typical symptoms are urgency and frequency of micturition and dysuria, which occurs because the sensory nerve endings in the bladder wall become hypersensitive and are stimulated before the bladder has filled (Waugh and Grant, 2006). The urine may appear cloudy and have an unpleasant smell because of the presence of pus, protein or leukocytes. Other symptoms that may occur with the disease are fever, fatigue, flank pain, haematuria, vomit and diarrhoea, mental status changes or confusion. In an elderly person, often, mental changes or confusion are the only signs of a possible UTI (Naish and Hallam, 2007). Overall, preventing introduction of infections through the urinary catheter can effectively reduce the risks of Mrs M develop a UTI.

The infection control measures, hand hygiene in particular, are essential nursing interventions to reduce cross infections. In 2003, winning ways (HD) <https://assignbuster.com/reducing-risks-of-catheter-associated-utis/>

identified actions necessary to improve infection control in all invasive devices. It highlighted that healthcare workers are a major route through which patients become infected and therefore standard precautions that comprises correct handwashing must ' rigorously and consistently' adopt by nurses to minimise the transmission of infection. The National Institute for Health and Clinical Excellence (NICE) (2003) developed evidence-based infection control guidelines for the prevention of infections during long-term urinary catheterisation. It emphasised the need for handwashing before and after contact with catheter and drainage bags, and the use of clean non-sterile gloves to prevent infections. In brief, the infection control measures are focus on preventing and controlling infections through eliminating the source/reservoir such as hands (the commonest form), or breaking the chain of transmission such as contacts.

While a catheter is in place, the other routine catheter care interventions include: regularly reviewed the patient's clinical need for continued catheterisation and remove the catheter as soon as possible; maintain a closed drainage system; daily clean the urethral area and the catheter with soap and water and clean the area thoroughly after all bowel movements to prevent infection; always keep the drainage bag lower than the bladder to assist in a good flow of urine and prevent stagnation of urine; ensure adequate urinary bag emptying to avoid overfilling the drainage bag and therefore to prevent reflux; and educate the patients on catheter care. These measures are accordance with national guidelines (NICE, 2003; Pratt et al, 2006)

Moreover, maintaining adequate fluid intake of a catheterized patient is also a practical nursing intervention. An adequate fluid intake can keep body hydrated and kidneys working, and aid sufficient urine flushing through the urinary tract, which makes less likely that bacteria can take hold and multiply. The clinical recommendation from Tenke et al (2008) is ' the patient should receive sufficient fluids given orally to maintain an output of more than 50-100 ml/h'. Hence, in Mrs M's case, it was essential that nurses applied these measures that known to be effective in reducing the risk of CAUTI to prevent Mrs M from unnecessary morbidity and discharge delay.

Further base on the scenario, if Mrs M develops CAUTI that accompanied with inflammation symptoms such as being unwell, fever, pain, or confusion, antibiotic treatment is required, which should be governed by the sensitivity of the causative organism. Before immediate empirical treatment is started, a specimen of urine should be taken for culture to identified bacteria and their sensitivity to the antibiotics (Scottish Intercollegiate Guidelines Network (SIGN), 2006). Oral Ciprofloxacin for seven days is the recommended first choice drug for treating a complicated UTI (SIGN, 2006; CKS, 2009b). It is active against both Gram-positive and Gram-negative bacteria, and can reach therapeutic levels in the blood or renal tissue (British National Formulary (BNF), 2008). After starting antibiotic treatment 24 hours, a review should be made to ensure the patient is responding to the treatment, as well as check the urine culture results and change the antibiotic if indicated (CKS, 2009b). Besides, if Mrs M's catheter has been in place for more than a week, evidence suggests that removal and change should be considered before starting the course of antibiotic in order to enhance the

treatment by reducing the bacteria load (Tenke et al, 2008). In summary, the antibiotic treatment aims to eradicate the infection that should result in the relief of the symptoms and the prevention of further complications. Further, it is important that nurses monitor the patient's condition regularly using various observations.

Routine patient observations are integrating components of nursing care. They allow the patient's progress to be monitored and thus ensure prompt detection of adverse events or delayed recovery (Stevenson, 2004).

Reviewing this case, regular recording vital signs help nurses to assess Mrs M's the clinical status and notice signs of infection timely. For instance, pyrexia is a marked sign of UTI, and tachycardia, hypotension or tachypnoea would imply the deterioration of the patient. Consequently investigation and treatment can be ensured without delay. Then following the administration of the treatment, observing vital signs is needed to monitor the patient's recovering progress and evaluate the treatment. The improvement of the vital signs would indicate a positive response to the antibiotic (CKS, 2009b). Another important observation that would assist the prevention and the treatment in this case is monitoring fluid balance to ensure adequate fluid input and urine output. The rationale of this has been explained earlier. Finally, as a bundle of evidences has illustrated that diabetes mellitus is one of the main underlying factors that causes a patient predispose to the development of a UTI, regularly checking blood glucose level in order to maintain a good control should also be carried out in Mrs M's case. Hence, patient observations are ongoing nursing assessments and they play a vital role in terms of managing a patient's condition(s).

In conclusion, patients who have an indwelling urinary catheter are susceptible to UTI. Nurses should ensure the evidence-based measures that could minimum the risk of CAUTI are implemented and embedded into practice. The intention of the treatment for a patient with symptomatic CAUTI is through eradicating the infection to relief the symptoms that caused by inflammatory response and prevent life-threatening complications, such as kidney damages. Lastly, good nursing observation practice is a key to manage patients' care timely and effectively.