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Ministry of Health

الإدارة العامة لمكافحة عدوى المنشآت الصحية

General Directorate of Infection Prevention and Control in Healthcare Facilities

(GDIPC)

Guidelines for Prevention of Catheter Associated Urinary Tract Infections (CAUTI)

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In the Name of ALLAH, Most Gracious, Most Merciful

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Abbreviations

CAUTI	Catheter-Associated Urinary Tract Infection
UTI	Urinary Tract Infection
HCW	Health Care Worker
CMS	Catheter Maintenance Solution

Introduction

- Urinary catheterization is defined as an intervention to enable emptying of the bladder by the insertion of a catheter.
- Urinary tract infections are the most common type of healthcare-associated infections, accounting for more than 30% of infections reported by acute care hospitals.
- All healthcare-associated UTIs are caused by instrumentation of the urinary tract. Catheter-associated urinary tract infection (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 bacteria and a source of transmission to other patients.
- The presence of a urinary catheter and the length of time it remains in place are the main contributory factors to the development of a catheter-associated urinary tract infection (CAUTI). It has been estimated that the risk of acquiring an infection increases by 5% each day the catheter remains in place.
- An average of 25% of hospitalized patients are catheterized at some stage during their stay, therefore, it is critical that practices and procedures are in place to minimize the risk of infection.

Objectives

- To provide and standardize the knowledge and practice related to new and updated evidence-based recommendations for the prevention of catheter-associated urinary tract infection (CAUTI) for all of healthcare professionals in all healthcare settings.

Methods of catheterization

a. **Indwelling urethral catheterization**: Inserted via the urethra and remains in situ for a short or prolonged period of time.
b. **Suprapubic catheterization**: Inserted via the abdomen for a short or prolonged period of time.
c. **Intermittent catheterization**: Inserted via the urethra but removed once the bladder has drained.
d. **Self-intermittent catheterization:** intermittent catheterization performed by the patient.

Risk factors for acquiring CAUTI

The following factors increase the risk of CAUTI occurrence:

1. Duration of catheterization
2. Underlying neurological disease
3. Female gender
4. Diabetes mellitus

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Recommendations for Prevention and Control of Catheter-Associated Urinary Tract Infections (CAUTIs):

Appropriate Urinary Catheter Use:

1. Insert catheters only for appropriate indications, and leave in place only as long as needed.

    a. Avoid catheterization that the decision to catheterize and the type of catheter to use should be based on comprehensive risk assessment and evaluation of the needs of the patient including the expected duration of catheterization.
    b. Minimize urinary catheter use and duration of use in all patients, particularly those at higher risk for CAUTI or mortality from catheterization such as women, the elderly, and patients with impaired immunity.
    c. Avoid use of urinary catheters in patients and nursing home residents for the management of incontinence.
    d. Use urinary catheters in operative patients only as necessary, rather than routinely.
    e. For operative patients who have an indication for an indwelling catheter, remove the catheter as soon as possible postoperatively, preferably within 24 hours, unless there are appropriate indications for continued use.

2. Consider using alternatives to indwelling urethral catheterization in selected patients when appropriate.

    a. Consider using external catheters as an alternative to indwelling urethral catheters in cooperative male patients without urinary retention or bladder outlet obstruction.
    b. Consider alternatives to chronic indwelling catheters, such as intermittent catheterization, in spinal cord injury patients.
    c. Intermittent catheterization is preferable to indwelling urethral or suprapubic catheters in patients with bladder emptying dysfunction.
    d. Consider intermittent catheterization in children with myelomeningocele and neurogenic bladder to reduce the risk of urinary tract deterioration.

Proper Techniques for Urinary Catheter Insertion:

1. Perform hand hygiene immediately before and after insertion or any manipulation of the catheter device or site.
2. Ensure that only properly trained persons (e.g., hospital personnel, family members, or patients themselves) who know the correct technique of aseptic catheter insertion and maintenance are given this responsibility.
3. In the acute care hospital setting, insert urinary catheters using an aseptic technique and sterile equipment.
4. Use sterile gloves, drapes, sponges, an appropriate antiseptic solution for peri-urethral cleaning, and a single-use packet of lubricant jelly for insertion.
5. The insertion site should be washed with soap and water and dried thoroughly. An aqueous or alcohol-based surgical site disinfectant solution (e.g., chlorhexidine or

povidone-iodine) should be used to disinfect the insertion site prior to insertion and allowed to dry thoroughly before proceeding with catheter insertion.

6. Routine use of antiseptic lubricants is not necessary.
7. In the non-acute care setting, clean (i.e., non-sterile) technique for intermittent catheterization is an acceptable and more practical alternative to sterile technique for patients requiring chronic intermittent catheterization.
8. Properly secure indwelling catheters after insertion to prevent movement and urethral traction.
9. Unless otherwise clinically indicated, consider using the smallest possible bore catheter, consistent with good drainage, to minimize bladder neck and urethral trauma.
10. If intermittent catheterization is used, perform it at regular intervals to prevent bladder over distension.
11. Consider using a portable ultrasound device to assess urine volume in patients undergoing intermittent catheterization and avoid unnecessary catheter insertions.
12. If ultrasound bladder scanners are used, ensure that indications for use are clearly stated, nursing staff are trained in their use, and equipment is adequately cleaned and disinfected in between patients.
13. When a catheter is inserted, each healthcare facility should have a system for documenting the following information in the patient record:
    a. Indication for catheter insertion.
    b. Date and time of catheter insertion.
    c. Type and size of catheter.
    d. Amount of water used to inflate the balloon.
    e. Name of HCW who inserted catheter.

Proper Techniques for Urinary Catheter Maintenance:

1. Following aseptic insertion of the urinary catheter, maintain a closed drainage system.
    a. If breaks in the aseptic technique, disconnection, or leakage occur, replace the catheter and collecting system using the aseptic technique and sterile equipment.
    b. Consider using urinary catheter systems with pre-connected, sealed catheter-tubing junctions.
2. Maintain unobstructed urine flow.
    a. Keep the catheter and collecting tube free from kinking.
    b. Keep the collecting bag below the level of the bladder at all times. Do not rest the bag on the floor.
    c. Empty the collecting bag regularly using a separate, clean collecting container for each patient; avoid splashing, and prevent contact of the drainage spigot with the nonsterile collecting container.
3. Use Standard Precautions, including the use of gloves and gown as appropriate, during any manipulation of the catheter or collecting system.
4. Changing indwelling catheters or drainage bags at routine, fixed intervals is not recommended. Rather, it is suggested to change catheters and drainage bags based on

clinical indications such as infection, obstruction, or when the closed system is compromised.

5. Unless clinical indications exist (e.g., in patients with bacteriuria upon catheter removal post urologic surgery), do not use systemic antimicrobials routinely to prevent CAUTI in patients requiring either short or long-term catheterization.
6. Do not clean the peri-urethral area with antiseptics to prevent CAUTI while the catheter is in place. Routine hygiene (e.g., cleansing of the meatal surface during daily bathing or showering) is appropriate.
    a. Meatal cleansing involves the mechanical removal of exudate and smegma. Where time allows, the meatal area should be washed with soap and water
7. Unless the obstruction is anticipated (e.g., as might occur with bleeding after prostatic or bladder surgery) bladder irrigation is not recommended.
    a. Routine irrigation of the bladder with antimicrobials is not recommended.
8. Routine instillation of antiseptic or antimicrobial solutions into urinary drainage bags is not recommended.
9. Clamping indwelling catheters prior to removal is not necessary.

Specimen Collection:

1. Obtain urine samples aseptically.
    a. If a small volume of fresh urine is needed for examination (i.e., urinalysis or culture), aspirate the urine from the needleless sampling port with a sterile syringe/cannula adapter after cleansing the port with a disinfectant.
    b. Obtain large volumes of urine for special analyses (not culture) aseptically from the drainage bag.

Management of Obstruction:

1. If obstruction occurs and it is likely that the catheter material is contributing to obstruction, change the catheter.
2. Recurrent blockage caused by encrustation of the catheter from deposits of mineral salts is a complication in approximately 50% of all long-term catheterized patients.
3. Catheter blockage causes leakage, bypassing of urine and urinary retention and results in an increased number of catheter changes.
4. Encrustation on the external surface of the catheter can cause trauma to the urethra during catheter removal.
5. Catheter maintenance solutions (CMS) are acidic washout solutions, which are commonly used to prolong catheter life by reducing pH resulting in the dissolution of existing encrustations.
6. Any disruption to the closed system increases the risk of infection. However, where frequent blockage would lead to frequent re-catheterizations, the potential infection risks associated with CMS use may be outweighed by increasing catheter life and reducing patient discomfort.

Changing Long-Term Catheters:

1. Long-term catheterization is defined as a catheter in place for greater than 28 days.
2. There is no consensus on how frequently such catheters should be changed.
3. Manufacturer's instructions should be followed in addition to individual patient's requirements (e.g., before blockage occurs or is likely to occur).
4. Regularly review the need for long-term catheterization.
5. Change catheters used for long-term catheterization as per manufacturer's instructions and individual patient requirements (e.g., before blockage occurs or is likely to occur).

Catheter Materials:

1. The selection of catheter material should be based on:
   a. The expected duration of catheterization.
   b. Patient comfort.
   c. Patient history of allergies to the components (e.g., latex allergy).
   d. The ease of insertion and removal.
   e. The ability of the catheter material to reduce the likelihood of complications such as colonization with bacteria, encrustations and tissue damage.
2. If the CAUTI rate is not decreasing after implementing a comprehensive strategy to reduce rates of CAUTI, consider using antimicrobial/antiseptic-impregnated catheters.
3. Hydrophilic catheters might be preferable to standard catheters for patients requiring intermittent catheterization.
4. Silicone might be preferable to other catheter materials to reduce the risk of encrustation in long-term catheterized patients who have frequent obstruction.

Education and Training:

1. Ensure that healthcare personnel and others who take care of catheters are given periodic in-service training regarding techniques and procedures for urinary catheter insertion, maintenance, and removal. Provide education about CAUTI, other complications of urinary catheterization, and alternatives to indwelling catheters.
2. When feasible, consider providing performance feedback to this personnel on what proportion of catheters they have placed meet facility-based criteria and other aspects related to catheter care and maintenance.
3. Education at the orientation of new staff and regular education of HCWs is recommended.
4. The education program should include the following:
   a. Indications for catheterization.
   b. Ongoing management of catheters
   c. Removal of catheters when no longer required.

5. Deficits in knowledge and practice of HCWs may lead to catheter associated urinary tract infection:
    a. Inappropriate use of a drainage bag to collect urine samples.
    b. Inappropriate use of multi–dose lubricant for catheter insertion.
    c. Changing catheter bags daily.
    d. Poor documentation of care.

References

1. *GUIDELINE FOR PREVENTION OF CATHETER-ASSOCIATED URINARY TRACT INFECTIONS, February 2017, https://www.cdc.gov/infectioncontrol/guidelines/cauti/index.html*
2. *Guidelines for the Prevention of Catheter associated Urinary Tract Infection, Irish Health Protection Surveillance Centre 2011*

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