Strategies to Prevent Catheter-Associated Urinary Tract Infections in Acute-Care Hospitals (2022)

About the Guideline

- This guideline updates the 2014 Strategies to Prevent Catheter-Associated Urinary Tract Infections (CAUTI) in Acute-Care Hospitals.
- The guideline is a summary of existing guidelines, recommendations, and requirements backed by the Society for Healthcare Epidemiology of America (SHEA) and the results summarized by a working group directed by SHEA, the Infectious Diseases Society of America, the American Hospital Association, The Joint Commission, and the Association for Professionals in Infection Control and Epidemiology. Additional input was obtained by other subject matter experts from other organizations and societies.
- The quality of evidence was categorized for strength using a combination of the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) scale and the Canadian Task Force on Preventive Health Care approach.

Key Clinical Considerations

Become familiar with the recommendations and best-practice statements provided in this guideline, especially if you work in an acute care setting.

Overview

- In 2003, 70% to 80% of urinary tract infections (UTIs) in hospitals were attributed to indwelling urinary catheters; that statistic has significantly decreased to 44%, as reported in 2019. Approximately 12% to 16% of patients will have an indwelling urinary catheter placed during their hospital stay. For almost half of those patients, an indwelling urinary catheter is not warranted. With each day that a urinary catheter remains in place, there is a 3% to 7% chance of bacteriuria occurring. Infection is one of the most undesirable results of an indwelling urinary catheter. However, there are numerous noninfectious, harmful consequences as well, such as structural trauma, urethral strictures, nonbacterial swelling of the urethra, and immobility complications, all which may lead to increased length of stay.
- Risk factors for UTI
    - Length of time the catheter remains in place (most important)
    - Older age
    - Female sex
    - Not maintaining a closed catheter system
- Risk factors for a blood stream infection related to a UTI
    - Neutropenia
    - Renal disease
    - Male sex
- The most common presenting symptoms for CAUTIs are elevated temperature and a positive urine culture.
    - A positive urine culture is defined as a urine specimen collected from a closed urinary drainage system aseptically, with a resulting organism count greater than or equal to 10^5 CFU/mL, not including yeast as a pathogen.

  - Other localized signs and symptoms, such as costovertebral angle pain or flank tenderness and/or pain in the pelvic area, may not be as obvious because the catheter is in place and may eliminate symptoms.
  - The limited ability of the patient to communicate due to comorbidities, illness, or age may also mask certain signs and symptoms.
  - Treating patients with antimicrobials prior to a definitive diagnosis of CAUTI can lead to antimicrobial resistance and/or the development of *Clostridioides difficile* infection.
- Appropriate indications to insert an indwelling catheter include the following:
  - Placement in the operating room for specific surgeries, such as genitourinary surgeries, and prolonged procedures, such as those that require high fluid volume or diuretics, thus requiring strict urinary output monitoring.
  - For clinical indications when measuring hourly urinary output is essential.
  - When urinary obstruction or acute urinary retention needs to be managed.
  - In select patients with incontinence to assist in healing of skin grafts or open pressure ulcers.
  - As part of palliative care and/or comfort care regimen to address specific patient goals.
- Dedicated staff should perform and be educated in catheter insertion, removal, and management as well as in CAUTI prevention and in alternative measures of bladder management.
- Staff competency should be observed in all areas of catheter management.

Essential Practices for Preventing CAUTIs

- Catheter insertion techniques
  - Urinary catheters should be inserted only for specific indications, and dwell time should be limited to those needs.
  - If feasible, other methods of bladder management should be considered, such as intermittent catheterization or external devices, when appropriate.
  - Maintain good hand hygiene before and after insertion and during the care and manipulation of the equipment.
  - Use sterile equipment, including gloves, drapes, and sponges; ensure the meatus is cleaned with sterile or antiseptic solution and that sterile lubricating jelly (single-use packet) is used for insertion. Maintain aseptic technique when inserting the catheter.
  - Minimize urethral trauma upon insertion by using the smallest size catheter that will allow for adequate urine flow.
  - Have a variety of different catheters and sizes available, in advance, at the bedside for potential difficult catheterization.
- Indwelling catheter management
  - To prevent movement and maintain urethral traction after insertion, firmly fix the catheter in place.
  - The drainage system should always remain closed and sterile.
  - Replace the catheter aseptically (using the above-noted insertion technique) if the drainage system becomes compromised, a leak is noted, or the system becomes disconnected.
  - Collecting urine samples
    - Small sample—after cleaning the needless port with a disinfectant, aspirate using a sterile syringe.
    - Large sample—collect from the drainage bag aseptically.

        - Samples should be transported in a timely manner or refrigerated when necessary, and/or specimen cups/tubes with preservatives should be used.
    - Urine flow should be unobstructed at all times.
        - Drainage bag must be below the level of the bladder but not on the floor.
        - Ensure that all catheter tubing is free of kinks.
        - Drainage bags should be emptied on a regular basis; do not touch the spigot to the patient-specific collection container when emptying.
- It is not necessary to clean the meatus daily with an antiseptic solution. Routine daily hygiene is appropriate.
- Document the catheter insertion date, time, and by whom, as well as each day it remains in place, the care provided, and when the catheter is discontinued. Also document the reason the catheter is required to remain in place.

Additional Approaches for Preventing CAUTIs

- Identify catheters that are no longer needed and remove them.
    - Methods of identification
        - Daily rounds on catheterized patients to determine necessity.
        - Automatic discontinuation orders, based on indications.
        - Reminders for physicians and nurses to regularly review necessity.
- Ascertain bladder residual volume on postoperative patients by utilizing a bladder scanner or by performing intermittent catheterization.
    - Nurses should be trained in the use and cleaning of bladder scanners according to the manufacturer's recommendations.
- CAUTI prevention measures should ***not*** include the following:
    - Routine use of antimicrobial/antiseptic impregnated catheters.
    - Breaking a closed system.
    - Screening catheterized patients for asymptomatic bacteriuria.
    - Treating catheterized patients for asymptomatic bacteriuria.
        - The exception to this recommendation is prior to an invasive urologic procedure.
    - Use of systemic antimicrobials for prophylaxis.
    - Routinely changing catheters.
        - An exception would be to obtain a fresh specimen, changing the catheter at the time of collection if the catheter has been indwelling for more than seven days.
- Catheter irrigation should be avoided to prevent CAUTIs.
    - Antimicrobials should not routinely be used in continuous bladder irrigations.
    - When continuous irrigation is used to prevent urinary obstruction, the system should remain closed.
- Observe the incidence of CAUTIs by monitoring patient groups, units, indications for catheter usage, catheter days, and patient days within the hospital.
- Additional data should be observed for catheter usage that may cause harm beyond CAUTIs, such as catheter obstruction, trauma caused by the catheter, unplanned removal and if reinsertion is needed within 24 hours of removal.
    - Feedback should be provided to all stakeholders.

Unresolved Issues

- Meatal and perineal cleaning with antiseptic solution versus sterile saline prior to insertion.

- Prevention of UTIs with urinary antiseptics.
- Segregation of patients with catheters to prevent transmission of infection.
- Replacement of catheters that have been in for more than 30 days.
- Adapting adult best practices for CAUTI prevention and urine culture management and tailoring them, accordingly, to the pediatric acute care setting.

Reference

Patel, P. K., Advani, S. D., Kofman, A. D., Lo, E., Maragakis, L. L., Pegues, D. A., Pettis, A. M., Saint, S., Trautner, B., Yokoe, D. S., & Meddings, J. (2023). Strategies to prevent catheter-associated urinary tract infections in acute-care hospitals: 2022 Update. *Infection control and hospital epidemiology*, *44*(8), 1209–1231. https://doi.org/10.1017/ice.2023.137