

Nurses' Role in Preventing Catheter-Associated Urinary Tract Infections

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Background Context

Catheter-associated urinary tract infection, commonly abbreviated as CAUTI, is an important patient-safety concern in hospitals and other healthcare settings. It occurs when microorganisms enter the urinary tract in association with the use of an indwelling urinary catheter and produce a symptomatic infection. CAUTI can cause pain, fever, kidney involvement, bloodstream infection, longer hospitalization, additional antibiotic exposure, and increased healthcare costs. The infection is particularly concerning because many cases are preventable through appropriate catheter use, safe insertion, careful maintenance, and timely removal. Nurses have a central role because they frequently insert catheters, provide daily catheter care, assess continued need, observe symptoms, document findings, and communicate with the wider healthcare team. They are also often the first professionals to recognize that a catheter no longer has an appropriate indication. Effective CAUTI prevention therefore depends on nursing knowledge, clinical judgment, communication, and the support of reliable organizational systems.

The motivation for selecting this topic is the clinical and financial burden associated with treating catheter-associated infections. The original article described CAUTI as a costly condition that may require hospitalization and expensive medication, and this concern remains valid. However, the cost of an individual infection varies considerably according to its severity, the patient's existing conditions, the length of additional hospitalization, and whether complications such as bacteremia develop. A single national cost figure from an older study should not be presented as a current estimate without adjustment for changing prices and methods. More importantly, financial cost represents only one part of the harm. Patients may experience discomfort, loss of mobility, sleep disruption, embarrassment, antibiotic-related adverse effects, and delayed recovery. Preventing unnecessary catheter exposure can improve safety while also reducing resource use.

The purpose of this article is to examine evidence-based interventions that help clinicians and nurses prevent CAUTI in hospitalized patients. It considers the appropriate indications for catheterization, the causes and diagnosis of infection, safe insertion, catheter maintenance, daily review, nurse-directed removal, reminder systems, and urine-culture stewardship. It also discusses the responsibilities of nurses within infection prevention, patient education, documentation, surveillance, and health informatics. The central argument is that the most effective strategy is not a single antiseptic product or medication. Prevention begins by avoiding unnecessary catheter insertion and limiting the number of days that a catheter remains inside the patient. When catheterization is clinically required,

consistent nursing care is essential for maintaining a closed and unobstructed drainage system. These actions should be supported by protocols, electronic reminders, competency assessment, leadership, and feedback.

Detailed Description of the Problem

CAUTI remains one of the most commonly recognized healthcare-associated infections. According to the Centers for Disease Control and Prevention, approximately 75 percent of urinary tract infections acquired in hospitals are associated with urinary catheters. Urinary catheters are used in an estimated 15 to 25 percent of hospitalized patients at some point during their care. These devices can be essential for selected patients, but they are frequently inserted without a continuing clinical indication or left in place after the original need has ended. The most important risk factor for developing CAUTI is the duration of catheterization. Each unnecessary catheter day gives microorganisms additional time to enter the urinary tract and establish colonization. Reducing the duration of use is therefore one of the most effective and direct nursing interventions.

The original article stated that 80 percent of hospital infections in acute-care settings were spread because of indwelling catheters. This statement is too broad because indwelling urinary catheters do not cause most types of hospital-acquired infection. A more accurate conclusion is that a large proportion of hospital-acquired urinary tract infections are related to urinary catheter use. Catheters are not responsible for unrelated infections such as surgical-site infection, pneumonia, or central line-associated bloodstream infection. Distinguishing these categories is important because infection-prevention strategies must address the specific device or procedure involved. Urinary catheter reduction can lower CAUTI risk, but it cannot replace the prevention measures needed for other healthcare-associated infections. Precise statistics make the clinical argument more credible and prevent exaggeration.

Recent national data demonstrate that improvement is possible. The CDC reported a significant 10 percent reduction in the catheter-associated urinary tract infection standardized infection ratio among acute-care hospitals between 2023 and 2024. This decline does not mean that the problem has been eliminated. It shows that coordinated prevention programs, improved catheter practices, surveillance, and organizational attention can produce measurable results. Rates may still vary considerably among hospitals, units, and patient populations. Intensive care, trauma, surgical, neurological, and long-term care settings may face different catheter indications and barriers to removal. Healthcare organizations should therefore examine their own utilization and infection data rather than relying only on national averages.

What Is a Urinary Catheter?

A urinary catheter is a flexible tube used to drain urine from the bladder. An indwelling urethral

catheter is inserted through the urethra, held inside the bladder by an inflated balloon, and connected to a closed drainage system. It is often called a Foley catheter. Other approaches include intermittent catheterization, in which the catheter is inserted temporarily and then removed, and external urine-collection devices that do not enter the bladder. A suprapubic catheter is surgically inserted into the bladder through the lower abdominal wall. These devices have different indications, benefits, and risks, and they should not be treated as interchangeable without clinical assessment.

Indwelling urinary catheters may be appropriate for acute urinary retention, bladder outlet obstruction, selected surgical procedures, accurate hourly urine-output measurement in critically ill patients, prolonged immobilization in specific trauma cases, and assistance with healing some severe sacral or perineal wounds in incontinent patients. They may also be used to improve comfort during end-of-life care when this approach is consistent with the patient's needs and goals. Catheters should not be inserted merely because a patient is incontinent, difficult to mobilize, or frequently requests assistance to use a toilet. They should not replace adequate nursing care, toileting support, continence management, or skin care. A catheter should also not be inserted simply to obtain a urine sample when the patient can void independently. Appropriate indication is the first safety checkpoint in CAUTI prevention.

How Catheter Use Predicts CAUTI

Catheter use is a significant predictor of CAUTI because the device creates a direct pathway between the external environment and the urinary tract. A catheter can carry microorganisms into the urethra and bladder during insertion. Organisms may later travel along the outside of the catheter or enter through breaks in the drainage system. The device can also damage the urethral lining, interfere with normal bladder emptying, and provide a surface on which bacteria form biofilms. A biofilm is a structured community of microorganisms attached to a surface and protected by a surrounding matrix. Once a biofilm develops, organisms may become difficult to remove and less responsive to antimicrobial treatment. The risk consequently increases as the catheter remains in place for longer periods.

The presence of a catheter can also obscure the normal signs of urinary dysfunction. Urine drains continuously, so urinary frequency and urgency may be less apparent than they are in patients without a catheter. Bacteria commonly colonize the catheter and urine over time without producing symptomatic infection. This colonization can lead clinicians to misinterpret a positive urine culture as proof of CAUTI. Unnecessary cultures and antibiotics may then expose patients to medication side effects, *Clostridioides difficile* infection, and antimicrobial-resistant organisms. Nurses play an important role in recognizing that cloudy or strong-smelling urine alone does not necessarily establish symptomatic infection. Clinical assessment and appropriate diagnostic criteria must guide decisions.

Etiology and Pathogenesis of CAUTI

Most catheter-associated infections occur when microorganisms enter through the urethral catheter system. Microorganisms may originate from the patient's own gastrointestinal or perineal flora, the hands of healthcare personnel, contaminated equipment, or a disrupted drainage system. Extraluminal migration occurs when organisms move along the external surface of the catheter between the urethral mucosa and the device. Intraluminal migration occurs when organisms enter the internal catheter system, often after disconnection, leakage, contamination of the drainage outlet, or improper specimen collection. Maintaining a continuously closed drainage system reduces opportunities for intraluminal contamination. Aseptic insertion and routine hygiene help limit contamination around the urethral opening. Each stage of care can therefore affect the pathway through which infection develops.

Common causative organisms include gram-negative bacteria, gram-positive bacteria, and yeasts. Frequently identified organisms may include *Escherichia coli*, *Klebsiella* species, *Proteus* species, *Pseudomonas aeruginosa*, *Enterococcus* species, and *Candida* species. The organism pattern differs among settings and patients, particularly when antibiotic exposure, prolonged hospitalization, critical illness, or long-term catheterization is present. Biofilm formation becomes increasingly likely as catheter duration increases. Some organisms, including urease-producing bacteria such as *Proteus mirabilis*, may contribute to crystalline deposits, encrustation, and catheter obstruction. The nurse should monitor urine flow and report obstruction, leakage, sediment, bleeding, or other changes requiring clinical assessment. However, visual changes alone should not be treated automatically as infection.

Diagnosing CAUTI

The diagnosis of CAUTI requires more than the presence of bacteria in a urine specimen. A symptomatic infection generally involves compatible clinical signs or symptoms together with microbiological evidence collected and interpreted according to the relevant clinical or surveillance criteria. Possible findings may include fever without another identified source, suprapubic tenderness, costovertebral-angle pain or tenderness, and urinary symptoms that remain clinically meaningful in the patient's situation. Symptoms may be difficult to assess in critically ill, unconscious, cognitively impaired, or neurologically injured patients. The nurse should complete a broad assessment rather than assuming that every fever or change in mental condition is caused by the urinary catheter. Other potential sources of infection, medication effects, dehydration, pain, metabolic abnormalities, and underlying illness should be considered. Diagnosis should involve clinical judgment by the responsible medical team.

Healthcare surveillance definitions and bedside diagnostic decisions serve related but different purposes. The CDC's National Healthcare Safety Network uses standardized definitions so hospitals

can measure and compare infection events consistently. A patient may require clinical treatment even when a case does not meet a surveillance definition, and a surveillance event is not intended to replace individual clinical judgment. Nurses involved in infection-prevention reporting must follow the current NHSN criteria rather than using personal interpretations. The date of catheter insertion, catheter days, symptoms, culture results, and timing of catheter removal must be documented accurately. Incorrect documentation can lead to inaccurate infection classification and misleading performance data. Reliable surveillance depends on accurate frontline nursing records.

Distinguishing CAUTI From Asymptomatic Bacteriuria

Catheter-associated asymptomatic bacteriuria occurs when bacteria are present in the urine of a catheterized patient without signs or symptoms indicating urinary tract infection. Colonization becomes increasingly common as the catheter remains in place. In most patients, asymptomatic bacteriuria should not be treated with antibiotics. Important exceptions include pregnancy and selected patients preparing for invasive urological procedures in which mucosal trauma is expected. Treating colonization unnecessarily does not reliably prevent symptomatic infection. It can instead promote antimicrobial resistance, medication reactions, and *C. difficile* infection.

Nurses can support diagnostic stewardship by questioning urine cultures that are requested without a clear clinical indication. This does not mean refusing an appropriate order or ignoring possible infection. It means communicating assessment findings and helping the team distinguish urinary symptoms from nonspecific changes. Urine should not be cultured automatically because it appears cloudy, contains sediment, or has an unusual odor. When culture is clinically required, the specimen should be collected aseptically from the disinfected sampling port rather than from the drainage bag. The date and time of collection, relevant symptoms, catheter status, and recent catheter changes should be documented. Good specimen collection improves the reliability of laboratory results.

Impact of CAUTI on Patients

The effects of CAUTI extend beyond temporary urinary discomfort. Patients may develop fever, bladder pain, kidney infection, bloodstream infection, sepsis, or worsening of an existing medical condition. Infection can delay surgery, rehabilitation, discharge, or transfer to another facility. Additional antibiotic treatment may cause nausea, diarrhea, allergic reactions, interactions, or kidney complications. Resistant organisms may limit treatment choices and increase the need for broader-spectrum drugs. Older adults and immunocompromised patients may experience particularly serious consequences. Preventing CAUTI therefore protects both immediate recovery and future treatment options.

The urinary catheter itself can cause noninfectious harm even when infection does not occur. Patients

may experience urethral trauma, bladder spasms, bleeding, pain, restricted mobility, pressure injury, and embarrassment. The drainage tubing can become caught on furniture or bedrails, causing traction and injury. A catheter may discourage patients from walking to the bathroom and contribute to physical deconditioning. It can also create a false sense of convenience that delays the restoration of normal toileting. These harms strengthen the case for daily assessment and prompt removal. Nursing practice should focus on avoiding all unnecessary catheter-related harm, not only infections counted by surveillance systems.

Role of Nurses Before Catheter Insertion

The nurse's first responsibility is to determine whether catheterization has an appropriate indication. Before insertion, the nurse should review the clinical order, assess the patient, and clarify vague or unsupported reasons. Statements such as "patient is elderly," "patient is incontinent," "staff are busy," or "fall risk" do not independently justify an indwelling urinary catheter. The nurse should determine whether toileting assistance, a urinal, bedside commode, continence product, external device, intermittent catheterization, or bladder scanning could meet the patient's needs more safely. This assessment requires knowledge of urinary retention, mobility, cognition, skin integrity, fluid balance, and the patient's preferences. Nurses should discuss suitable alternatives with physicians and the interprofessional team. Preventing insertion is more effective than trying to prevent infection after an unnecessary device has been placed.

Bladder ultrasound can help assess urine volume and reduce unnecessary catheter insertion in selected patients. Nurses using bladder scanners must receive training and follow clear indications. The equipment should be cleaned and disinfected between patients according to the manufacturer's instructions and facility policies. Scan results should be interpreted within the patient's clinical context because obesity, ascites, pelvic masses, dressings, or other factors may affect accuracy. A high post-void residual may require further evaluation, intermittent catheterization, or treatment of urinary retention. A low volume may indicate that catheter insertion is unnecessary. Bladder scanning supports clinical judgment but does not replace it.

Aseptic Catheter Insertion

When an indwelling catheter is necessary in an acute-care hospital, it should be inserted using aseptic technique and sterile equipment. Hand hygiene must be performed immediately before and after insertion or manipulation. The procedure normally requires sterile gloves, a sterile drape, appropriate cleansing supplies, a sterile catheter, a closed drainage system, and single-use lubricant. Only personnel who have been trained and assessed as competent should perform the insertion independently. If the sterile field is contaminated, the nurse should stop and replace the affected equipment rather than continuing because the procedure has already begun. A checklist or trained observer can help identify breaks in technique. Competence should be reassessed periodically rather

than assumed permanently after one training session.

The nurse should select the smallest catheter size that permits effective drainage unless a different size is clinically required. Larger catheters may increase urethral trauma and discomfort. The catheter should be inserted only far enough to confirm urine flow and allow safe balloon inflation according to the product instructions and patient anatomy. Inflating the balloon within the urethra can cause severe pain, bleeding, and injury. The catheter must be secured after insertion to prevent movement and traction. The drainage bag should be positioned below bladder level without resting on the floor. Details including the indication, catheter type and size, insertion date and time, urine characteristics, and name of the inserter should be documented.

Catheter Maintenance

After insertion, the nurse must maintain a continuously closed drainage system. The connection between the catheter and tubing should not be separated unnecessarily. If disconnection, leakage, or a major break in aseptic technique occurs, the catheter and collection system may need replacement using sterile technique. The tubing should remain free from kinks, compression, dependent loops, and obstruction. The collection bag must stay below the bladder to prevent backflow while remaining off the floor. It should be emptied regularly into a clean container assigned to that patient. The drainage outlet should not touch the container or other contaminated surfaces.

Routine daily hygiene is appropriate for the periurethral area while the catheter remains in place. Repeated cleansing with strong antiseptic solutions has not been shown to prevent CAUTI and may cause irritation. The nurse should clean the area during normal bathing and after soiling, following institutional policy. Gloves should be worn when manipulating the catheter or drainage system, and hand hygiene remains necessary before and after glove use. Catheters and bags should not be replaced at fixed intervals solely to prevent infection. Replacement should be based on clinical indications such as obstruction, infection management, leakage, or compromise of the closed system. Routine antimicrobial bladder irrigation and antimicrobial solutions in drainage bags are not recommended for prevention.

Securement and patient positioning should be checked throughout each shift. A poorly secured catheter can move during turning, walking, transport, or transfer, causing urethral traction and discomfort. Tubing should have enough slack to permit movement without forming loops that obstruct drainage. The bag should be repositioned appropriately when the patient moves between the bed, chair, wheelchair, and diagnostic departments. Low urine output should prompt assessment of hydration, kidney function, hemodynamic status, tubing obstruction, and bladder distension rather than immediate irrigation. If obstruction is suspected and the catheter remains required, the clinical team should determine whether catheter replacement is indicated. Nurses must respond to the patient's complete condition rather than focusing only on the device.

Daily Assessment and Timely Removal

Every patient with an indwelling urinary catheter should be assessed daily for continued need. Nurses are particularly well positioned to perform this assessment because they observe the patient's urine output, mobility, toileting ability, skin condition, fluid status, and clinical progress. The indication should be discussed during shift reports, bedside rounds, and multidisciplinary reviews. A catheter should not remain in place simply because no one has considered removing it. When the indication has resolved, the nurse should contact the responsible practitioner or apply an approved nurse-driven removal protocol. For many postoperative patients, removal should occur as soon as possible, preferably within 24 hours, unless a valid reason for continued catheterization exists. Reducing catheter days directly reduces exposure to infection risk.

Nurse-driven protocols allow trained nurses to remove catheters without waiting for an individual physician order when predefined criteria are no longer met. These protocols should be approved by medical and nursing leadership and incorporated into institutional policy. They should clearly identify appropriate indications, exclusions, post-removal monitoring, and escalation procedures. Nurses must still communicate with physicians in unusual or complex cases. A protocol does not mean that every catheter is removed automatically without clinical judgment. It gives nurses the authority to act promptly within agreed safety boundaries. Organizational support is necessary so nurses are not discouraged or blamed for following the protocol appropriately.

Physical and Electronic Reminders

Physical and virtual reminders can reduce the duration of catheter use by making the presence of the device visible to clinicians. Physical reminders may include bedside prompts, catheter labels, daily checklists, whiteboard notes, stickers, or catheter-status questions during rounds and shift handovers. Electronic reminders may appear in the health record, computerized order system, nursing task list, or clinical decision-support platform. These systems can ask whether the patient still meets an approved indication. A stop order may expire after a defined period unless the clinician actively documents a continuing reason. The purpose is not to replace clinical judgment but to prevent a catheter from being forgotten. Reminders are especially valuable during transfers between departments and changes in clinical teams.

AHRQ reports that reminder systems and automatic stop orders have reduced catheter duration and CAUTI risk in reviewed studies. Their effectiveness depends on workflow design and staff response. Excessive electronic alerts can produce alert fatigue, causing clinicians to ignore even important notifications. A reminder should therefore appear at a useful decision point and provide a simple route to document the indication or initiate removal. Health informatics teams should evaluate whether alerts are being opened, acted upon, or repeatedly overridden. Data should be shared with nurses and physicians so they can see whether the system improves practice. Technology supports

prevention only when it is integrated with clear policy, education, and accountability.

Post-Removal Nursing Care

Catheter removal is not the end of nursing responsibility. The nurse should monitor whether the patient resumes spontaneous urination within the expected period. Assessment may include urinary urge, voided volume, bladder discomfort, abdominal distension, fluid intake, and post-void residual measurement when clinically indicated. Patients should receive privacy, mobility assistance, appropriate toileting equipment, and regular opportunities to void. Prompted toileting may be helpful for patients who have cognitive or physical limitations. The nurse should recognize signs of urinary retention and follow the approved escalation or intermittent catheterization protocol. Re-insertion should not occur automatically without assessing the cause and available alternatives.

Some patients experience temporary difficulty voiding after catheter removal, particularly after surgery, anesthesia, medication changes, or prolonged catheterization. Bladder scanning can help determine whether retention is present. Intermittent catheterization may be safer than replacing an indwelling catheter when repeated drainage is not expected to be required continuously. The patient should also receive instructions about symptoms that need reporting, including severe lower abdominal pain, inability to urinate, fever, or new urinary symptoms. Accurate documentation supports continuity between shifts and departments. Effective post-removal care reduces unnecessary re-catheterization. It also helps restore normal mobility and toileting.

Urine-Culture Stewardship

Nurses play an important role in preventing unnecessary urine cultures. A urine culture should be obtained when the patient has compatible signs and symptoms and when the result will influence management. Culturing urine in the absence of symptoms frequently identifies colonization rather than infection. This can lead to unnecessary antibiotics and incorrect labeling of CAUTI. Nurses should communicate the patient's temperature, pain, urinary symptoms, catheter status, other possible infection sources, and relevant assessment findings before collection. They should also confirm whether the catheter has been in place long enough to affect specimen interpretation. Diagnostic stewardship protects patients from both missed infection and overtreatment.

When a specimen is ordered, it must be collected correctly. A small volume for culture should be obtained aseptically from the needleless sampling port after the port has been disinfected and allowed to dry. Urine for culture should not be collected from the drainage bag because stagnant urine may be contaminated and may not represent the condition inside the bladder accurately. If the catheter has been in place for a prolonged period and remains necessary, the clinical team may consider whether catheter replacement is appropriate before collecting the specimen. The collection time and method should be documented. Specimens should be transported according to laboratory

requirements. Poor specimen technique can result in false or misleading information and inappropriate treatment.

Patient and Family Education

Patients and families should be treated as partners in CAUTI prevention. The nurse should explain why the catheter is required, how long it is expected to remain, and what risks are associated with continued use. Patients should be encouraged to ask each day whether the catheter is still necessary. They should know not to pull, twist, clamp, disconnect, or reposition the system without assistance. The patient can also help ensure that the drainage bag remains below the bladder and that the tubing is not kinked. Education should be delivered in language the patient can understand and adapted for health literacy, language, cognition, and sensory needs. Written materials can reinforce verbal instruction but should not replace conversation.

Some patients request a catheter because they fear pain, falls, embarrassment, or frequent assistance with toileting. The nurse should listen to these concerns rather than dismissing them. Safer alternatives may include scheduled toileting, bedside commodes, mobility support, urinals, continence products, external devices, or adjustments to the care plan. Patients receiving long-term catheter care need instruction in hand hygiene, bag positioning, tubing care, drainage, signs of obstruction, and symptoms requiring medical attention. Family caregivers may also require practical teaching and demonstration. Education can improve cooperation and reduce manipulation of the system. It can also prevent the catheter from becoming a substitute for adequate support.

Nursing Documentation

Accurate documentation is essential for individual patient care and infection surveillance. The record should identify the clinical indication for catheterization, insertion date and time, catheter type and size, inserter, and any difficulty or complication. Continued need should be documented during daily assessment. Maintenance findings may include urine output, tubing position, drainage-system integrity, securement, hygiene, symptoms, and interventions. The removal date and time should be recorded together with the post-removal plan. Documentation should be standardized so important information is easy to locate. Searchable electronic fields are more useful for quality improvement than information hidden in free-text notes.

Poor documentation can allow unnecessary catheter use to continue. A nurse receiving a patient from another unit may not know why the catheter was inserted or whether the original indication still applies. A missing insertion date makes catheter-duration tracking difficult. Unclear specimen documentation can affect interpretation of culture results. Electronic systems should therefore display the catheter indication and duration prominently. Required documentation fields should be designed carefully so staff provide meaningful information rather than selecting inaccurate options simply to

continue. Regular audits can identify missing or inconsistent records. Feedback should focus on improvement rather than punishment.

Nursing and Health Informatics

Health informatics can strengthen CAUTI prevention by connecting clinical practice with timely information. Electronic health records can identify all catheterized patients, calculate catheter days, display approved indications, create daily review tasks, and trigger removal reminders. Dashboards can show unit-level catheter utilization, infection rates, compliance with documentation, and trends over time. Infection-prevention professionals can use these data to identify units that need additional support. Nurse leaders can compare results before and after a protocol is introduced. Automated systems can also help identify unnecessary urine cultures or prolonged postoperative catheterization. Information must be accurate and clinically meaningful for these tools to work.

Nurses should participate in the design and evaluation of digital systems because they understand bedside workflows. An alert that appears during an unrelated task may be ignored, while a prompt included in shift assessment or multidisciplinary rounds may lead to action. Informatics nurses can translate clinical requirements into structured documentation, decision rules, reports, and educational tools. They can also monitor unintended effects such as duplicate tasks, alert fatigue, or inappropriate removal prompts. Privacy and cybersecurity requirements remain important when patient data are used for surveillance. Quality reports should avoid exposing identifiable information beyond those who need access. Technology should make safe practice easier rather than adding unnecessary administrative burden.

Quality Improvement and Surveillance

CAUTI prevention should be treated as an ongoing quality-improvement process. Hospitals need to monitor both infection outcomes and the practices that influence those outcomes. Useful measures may include catheter utilization ratio, catheter days, CAUTI events, percentage of catheters with an approved indication, compliance with insertion technique, and time from resolution of indication to removal. Infection rates alone may not identify where the process is failing. A unit may have a temporarily low infection rate while continuing to use too many unnecessary catheters. Process measures provide earlier warning and allow teams to intervene before harm occurs. Data should be reviewed regularly at both unit and organizational levels.

Nurses should be involved in reviewing CAUTI events because they can provide information about the patient's daily care and workflow. A structured review may examine why the catheter was inserted, whether the indication remained valid, how it was maintained, whether the closed system was disrupted, and whether symptoms and cultures were interpreted correctly. The purpose should be to identify system weaknesses rather than search automatically for one person to blame. Findings may

reveal training gaps, supply problems, unclear policies, delayed medical review, staffing pressure, or poorly designed electronic alerts. Corrective actions should have named responsibilities and follow-up dates. Results should be shared with frontline staff so the review leads to learning.

Education and Competency

Nurses who insert or care for urinary catheters require periodic education and competency assessment. Training should cover appropriate indications, alternatives, aseptic insertion, securement, maintenance, specimen collection, daily review, removal, retention management, and patient education. Simulation can allow staff to practice insertion and recognize contamination without placing a patient at risk. Direct observation helps assess whether the nurse can maintain the sterile field and respond when contamination occurs. Competency should also include clinical judgment about when not to insert a catheter. Annual online education alone may not demonstrate practical skill. Healthcare organizations should combine knowledge assessment with observed performance and feedback.

Education should be adapted to different clinical areas. Intensive-care nurses may require guidance on when hourly urine measurement is truly necessary. Surgical nurses need procedure-specific removal expectations and management of postoperative retention. Emergency nurses may encounter pressure to place catheters quickly before transfer. Rehabilitation and geriatric nurses may need stronger alternatives for mobility, continence, and cognitive impairment. Home-care and long-term-care staff require education on chronic catheter complications and caregiver teaching. A universal prevention principle can be applied differently according to the setting. Education is most effective when it uses realistic cases from the staff's own clinical environment.

Interprofessional Collaboration

Although nurses have a critical role, CAUTI prevention is not a nursing responsibility alone. Physicians and advanced practitioners must avoid unnecessary orders and respond promptly when catheter removal is recommended. Infection-prevention specialists provide surveillance expertise and help interpret trends. Pharmacists support antibiotic stewardship and review treatment when cultures identify colonization rather than infection. Urologists assist with obstruction, difficult insertion, anatomical abnormalities, and specialist catheter plans. Information-technology teams develop effective reminders and reports. Hospital leadership must provide supplies, staffing, training, and authority for nurse-driven protocols.

Effective teamwork requires respectful communication. Nurses should feel able to question an unsupported catheter order or recommend removal without fear of dismissal. Physicians should receive concise clinical information, including the original indication, current patient status, alternatives, and post-removal plan. During handover, catheter status should be treated as a safety

issue rather than a minor line item. Daily rounds should include a direct question about whether the device remains necessary. Leaders should recognize staff members who prevent unnecessary catheter days. A shared safety culture is more sustainable than a campaign directed only at individual nurses.

Barriers to Effective CAUTI Prevention

Several barriers can interfere with evidence-based prevention. Staff may believe that catheters save time, reduce falls, protect skin, or make urine measurement easier even when the clinical indication is weak. Nurses may be reluctant to recommend removal because they expect disagreement from physicians or fear that the patient will require reinsertion. High workload can reduce the time available for toileting, mobility, skin care, and continence support. Bladder scanners, external devices, commodes, and appropriate supplies may not be readily available. Electronic records may fail to display catheter duration clearly. Patients or families may also resist removal because they misunderstand the risks.

Addressing these barriers requires organizational action rather than repeated instructions to “be more careful.” Units need adequate staffing and access to alternatives. Leadership should approve clear protocols and publicly support nurses who apply them appropriately. Education should correct myths about catheter convenience and fall prevention. Data should be shared in a form that helps staff understand the effect of their actions. Difficult cases should be discussed without undermining the standard prevention process. Sustainable improvement depends on aligning policy, resources, culture, technology, and clinical practice.

Updated Research Questions

The original article proposed four useful questions that can be retained and answered through current evidence:

1. How is catheter use a significant predictor of catheter-associated urinary tract infection?
The catheter creates a route for microorganisms to enter the urinary tract, promotes biofilm formation, disrupts normal defenses, and increases risk as the duration of use grows. (Centers for Disease Control and Prevention, 2025)
2. What are the etiology and diagnostic principles of CAUTI?
CAUTI commonly results from organisms migrating along the catheter or entering a disrupted drainage system. Diagnosis requires compatible symptoms and appropriate microbiological evidence rather than a positive culture alone.
3. How do physical and virtual reminders support prevention?
Reminders, stop orders, daily rounds, and electronic decision support make catheter use visible and encourage removal when the indication has ended. (Agency for Healthcare Research and

Quality, n.d.-a)

4. What are the implications for nursing and health informatics?

Nurses assess indications, use alternatives, insert and maintain catheters safely, remove unnecessary devices, educate patients, support diagnostic stewardship, document care, and use informatics systems to monitor catheter use and outcomes. (Centers for Disease Control and Prevention, 2024a)

These questions demonstrate that CAUTI prevention involves clinical practice, behavior, organizational policy, and information systems. They also show why nurses must be included in planning and decision-making. Research should continue evaluating which combinations of interventions work best in different patient populations. Facilities should not assume that a protocol effective in one setting will function identically in another. Local data and frontline feedback are necessary for adaptation. The strongest programs combine evidence-based technical practices with a culture that supports staff action.

Conclusion

Catheter-associated urinary tract infection is a significant but frequently preventable healthcare-associated infection. The greatest modifiable risk is prolonged exposure to an indwelling urinary catheter. Nurses can reduce this risk by preventing inappropriate insertion, recommending alternatives, applying aseptic technique, maintaining a closed drainage system, ensuring unobstructed urine flow, and reviewing the indication every day. Nurse-driven removal protocols and well-designed reminders can prevent catheters from remaining in place after they are no longer needed. Nurses also support accurate diagnosis by distinguishing symptomatic infection from asymptomatic bacteriuria and collecting urine specimens correctly. Patient education, documentation, surveillance, and health informatics extend these preventive responsibilities beyond direct catheter care. Effective prevention requires interprofessional cooperation and organizational support.

The original article correctly recognized that clinicians may be unaware that a patient still has a catheter and that physical or virtual reminders can improve removal decisions. Modern evidence strengthens this point by placing daily review and nurse empowerment at the center of prevention. CAUTI should not be viewed as an unavoidable consequence of hospitalization. Every catheter insertion should have a documented reason, every catheter day should be justified, and every catheter should be removed as soon as it is no longer necessary. Nurses are the professionals most consistently positioned to make these principles part of daily patient care. Their actions can reduce infection, discomfort, immobility, antibiotic exposure, length of stay, and healthcare costs. Preventing CAUTI is therefore both a technical nursing responsibility and an essential expression of patient advocacy.

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