

# Actionable Patient Safety Solutions™ (APSS™): Catheter-Associated Urinary Tract Infections (CAUTI)

## How to use this guide

This APSS provides evidence-based actions and resources for executives, leaders, clinicians, and performance improvement specialists. This document is intended to be used as a guide for healthcare organizations to examine their own workflows, identify practice gaps, and implement improvements. In it, you'll find:

**Best Practice Summary:** A high level summary of evidence-based, clinical best practices. (page 2)

**Executive Summary:** Executives should understand the breadth of the problem and its clinical and financial implications. (page 3)

**Leadership Checklist:** This section is for senior leaders to understand common patient safety problems and their implications related to Catheter-Associated Urinary Tract Infections (CAUTI). Most preventable medical harm occurs due to system defects rather than individual mistakes. Leaders can use this checklist to assess whether best practices are being followed and whether action is needed in their organization around CAUTI. (page 3)

**Clinical Workflow:** This section includes more specific information about CAUTI across the continuum of care. Leaders should include the people doing the work in improving the work. This section outlines what should be happening on the frontline. Clinicians can use this section to inform leaders whether there are gaps and variations in current processes. This is presented as an infographic that can be used for display in a clinical area. (page 5)

**Education for Patients and Family Members:** This section outlines what frontline healthcare professionals should be teaching patients and family members about CAUTI. Clinicians can inform leaders whether there are gaps and variations in the current educational processes. (page 7)

**Performance Improvement Plan:** If it has been determined that there are gaps in current practice, this section can be used by organizational teams to guide them through an improvement project. (page 9)

**What We Know about CAUTI:** This section provides additional detailed information about CAUTI. (page 12)

**Resources:** This section includes helpful links to free resources from other groups working to improve patient safety. (page 14)

**Endnotes:** This section includes the conflict of interest statement, workgroup member list, and references. (page 15)

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# Best Practice Summary

## Upon Admission

- If a urinary catheter is present upon admission, conduct a thorough assessment of the patient and document any findings in the medical record.
- Check for signs of infection while adhering to proper aseptic techniques

## Routine Care

- Determine whether a catheter is necessary before insertion and consistently during routine care.
- Determine justification for use based on appropriate indications demonstrated by the patient. Consider asking the following:
  - Does the patient have urinary retention or bladder obstruction?
  - Does the patient have difficulty urinating?
  - Is the patient undergoing a long surgical procedure or is there a need for intraoperative monitoring of urinary output?
  - Will the patient be immobile for an extended period of time?
  - Is the patient currently in end of life care?
- Ask the patient if they have a preference on how they would like insertion done and by whom and maintain patient privacy.
- If a catheter is inserted perioperatively, ensure that it is removed as soon as possible post op.
- Ensure that proper sanitary precautions are being taken in the day to day care of the patient to prevent infection.
  - Perform hand hygiene.
  - Adhere to aseptic technique.
  - Maintain unobstructed urine flow and a closed drainage system.
  - Verify that the catheter is secure.
  - Empty drain bag using safe empty practices.
  - Monitor for signs of worsening condition or sepsis.
- Periodically assess for necessity for the catheter and ensure clarity of this assessment in the hand-off.
- Assess and determine if an alternative/external urine collection device can be implemented.
- Determine continuation of catheter use using tools such as the Houdini Tool Catheter Removal Protocol. Follow the [Urinary Retention Protocol Algorithm](#) for more information.
- Ensure that the patient and family are kept informed of the status of the catheter and how/why it is being used at any given time.

If a patient is discharged with a catheter, provide education for its maintenance and removal at home.

# Executive Summary

## The Problem

Because 17%-69% of catheter-associated urinary tract infections (CAUTI) are preventable, including 380,000 cases and 9,000 deaths annually, and because the Centers for Medicare and Medicaid (CMS) defined CAUTI as a non-payment infection, heightened precautions should be allocated to the monitoring and prevention of cases ([CDC, 2009](#); [Peasah et al., 2013](#)). Yet, translating the best practices, like those in the CAUTI bundle, into reliable frontline processes is immensely challenging due to human factors in an ever-changing environment.

## The Cost

It is estimated that CAUTI is directly associated with an annual death rate of between 9,000 to 13,000 ([CDC, 2009](#)). Annually, CAUTI alone costs the healthcare system \$450 million, with significant capacity for an increase in cost upon acquisition of directly-related complications, including urosepsis and septicemia ([Peach et al., 2016](#)). Complications with CAUTIs are the leading cause of sepsis in adults over 65, which itself is the 10th leading cause of death in the US ([Peach et al., 2016](#)).

## The Solution

Many healthcare organizations have successfully implemented and sustained improvements to mitigate the organizational and clinical impacts of seasonal community-acquired respiratory infections. This document provides a blueprint that outlines the actionable steps organizations should take to successfully manage community-acquired severe respiratory illness and summarizes the available evidence-based practice protocols. This document is revised annually and is always available free of charge on our website.

## Leadership Checklist

On a monthly basis, or more frequently if a problem exists, the executive team should review all healthcare associated infection trends. Use this checklist as a guide to determine whether current evidence-based guidelines are being followed in your organization:

- Measure and report CAUTI incidence monthly (CAUTI based on CDC NHSN definitions for all inpatient united ([CDC, 2015](#))/total number of urinary catheter-days for all patients with a urinary catheter in all tracked units). Note trends in areas with high incidence and prevalence. Routinely reassess outcomes.
- If CAUTI rates indicate room for improvement, initiate a PI (performance improvement) project. If a problem is not indicated, routinely reassess to identify gaps, and ensure integrity of the data collected.

### **Involve those doing the work in the improvement effort.**

- Ensure frontline involvement in CAUTI improvement activities. Maintain their engagement and remove barriers to progress.
- Understand how policies and procedures are helping staff champion the removal of the catheters when indicated.
- Assess whether the inappropriate insertion is due to a lack of knowledge about evidence-based indications for insertion or if it is due to other reasons.
- Ensure that CAUTI protocols are embedded into clinical workflows, whether electronic or

paper. Involve all stakeholders as early as possible when making or planning a change that will impact their workflow.

- Ensure there are enough staff to effectively manage necessary preventive care.
- Ensure adequate training and documentation of CAUTI competencies and skills for all involved (e.g., train admitting staff properly to maintain a heightened sense of awareness for signs of CAUTI).
- Debrief on a regular basis to solicit team feedback about barriers to sustained compliance. Adjust the plan quickly and nimbly as needed. Create a standardized process for evaluation of fallouts.
- Acknowledge those doing the work for their successes using direct data tied to their behaviors.
- Engage with providers to obtain buy-in and compliance.
- Refer to your nation's infectious disease experts for specific regulations/guidance (e.g., routine urine testing and/or culture).

### **Prioritize person-centeredness in the CAUTI initiative.**

- Establish the expectation that each patient with a catheter will have a multidisciplinary team assessment and will be involved in decision making and hand-offs at every possible opportunity.
- Educate frontline clinicians about the impact of the invasive catheter insertion beyond the immediate point of care.
- Establish systems to help those on the frontline coordinate resources for patients when a need is identified. See [Care Coordination](#) APSS.
- Establish a mechanism for those on the frontline to elevate patient needs identified that do not have an appropriate resource/solution (e.g., lack of transportation will compromise the patient's ability to visit an outpatient provider after discharge). See [Social Determinants](#) APSS.

### **Sustain improvements.**

- Ensure that leaders have a simple process to oversee CAUTI improvement work while also considering how it aligns with other initiatives across the organization. Establish an oversight committee to ensure alignment between all specific HAI committees.
- Standardize communication upon any changes (e.g., equipment, process, etc).
- Assess vendor shortage mitigation plan and compare plans across multiple vendors. Determine the capacity for sourcing equipment from multiple areas in the case of an emergency.

# Clinical Workflow

## 1. ADMISSION

**If an indwelling urinary catheter is present on admission, assess immediately.**

- Check for signs of infection and assess for necessity and document.
- Consider the possibility of varied symptoms that may be somewhat atypical.
- Determine need for removal, insertion of new indwelling catheter, or use of alternative collection device.
- Adhere to aseptic technique.



## 2. ROUTINE CARE

**Catheters should only be inserted if appropriate.**

- Justify insertion of the catheter based on evidence-based recommendations, as the best way to prevent CAUTI is to avoid insertion in general.
- Appropriate indications include:
  - Urinary retention or bladder obstruction
  - Voiding difficulties
  - The need for measurements of output
  - Use for long surgical procedures
  - The need for intraoperative monitoring or urinary output
  - Immobilization for a long period of time
  - Comfort for end of life care.
- Do not use indwelling catheters in place of nursing care or to obtain a urine culture when the patient is able to perform voluntarily.
- Consider alternatives to an indwelling catheter, such as intermittent catheterization or suprapubic catheters ([Gray et al., 2016](#)).
- Ask patients if they have a preference of which staff member (male or female) inserts the catheter and maintain the patient's privacy (e.g., curtains, etc).

**Minimize duration of catheter use.**

- If inserted perioperatively, remove as soon as possible post-op.
- Consider the use of a bladder scanner to assist in determination of urine volumes.

**Certain steps should be included in day to day care to avoid and monitor for presence of infection.**

- Ensure hand hygiene with soap and water is performed routinely by providers, patients, and visitors.
- Assess for catheter necessity and document. Ensure clarity of this assessment in the

hand-off. See [Hand-Off Communication](#) APSS.

- o Include patients and family members in the hand-off whenever possible. As the clinical hand-off is being conducted by a frontline clinician, watch the nonverbal communication of the patients and family members to try to understand unspoken needs.
- Select the best catheter size for the patient.
- Assess if alternative/external urine collection device can be implemented.
- Conduct assessment of urine output.
- Adhere to aseptic technique.
- Perform meatal hygiene with unscented wash.
- Use sterile supplies/equipment
  - o Catheter insertion kit (sterile gloves, drape, sponges)
  - o Antiseptic or sterile solution to clean meatal area
  - o Lubricant jelly
- Maintain unobstructed urine flow.
- Keep the catheter and collecting tube free from kinking.
- Verify catheter securement device is in place.
- Ensure closed drainage system.
- Keep the collecting bag below the level of the bladder at all times. Do not rest the bag on the floor.
- Assess skin.
- Empty drain bag using a clean container and safe emptying practices. Do not hold the bag upside down while emptying and empty the bag every eight hours (or when 2/3 full) ([WHO](#)).
- Verify unobstructed flow.
- Unless contraindications exist, do not use antimicrobials routinely to prevent CAUTI ([CDC, n.d.](#)).
- Encourage fluid intake of at least 2 liters, if there isn't a contraindication for fluids (e.g., CHF patients).
- Determine continuation of catheter use using tools such as the [Houdini Tool Catheter Removal Protocol](#). Follow the [Urinary Retention Protocol Algorithm](#) for more information.

**In addition to monitoring for signs of CAUTI, the patient should always be monitored for signs of sepsis in response to CAUTI to prompt early recognition and avoid deterioration (see [Sepsis APSS](#)).**

**Remove catheter as soon as possible.**



### 3. DISCHARGE

#### **Upon discharge, communicate guidelines for catheter use and infection prevention.**

- Assess necessity and promptly remove indwelling urinary catheters if no longer necessary.
- Assess for signs/symptoms of infection.
- If the patient is going home with an indwelling catheter in place, begin preparation for discharge as soon as possible while the patient is still in the hospital to allow for thorough education on maintenance, need, and next steps. See [Care Coordination](#) APSS.
- Educate patients and family on CAUTI prevention, including maintenance information and expectations of catheter use based on the patient's circumstance. See "[Education for Patients and Family Members](#)" section.
- If transfer, include indwelling urinary catheter information in report/handoff. Anticipate gaps in the receiving clinician's understanding of the hand-off report and work to mitigate these potential gaps early on. See [Hand-Off Communication](#) APSS.
- Anticipate the patient's journey after they leave your direct care and screen for patient needs for future safety. Connect the patient with these resources, whether clinical resources or community-based resources.
- Remain sensitive to the patient's spoken and unspoken needs (e.g., socioeconomic challenges that may compromise patient's recovery). If resources don't exist based on the needs of the patient, elevate this gap to leadership. See [Social Determinants](#) APSS.

## Education for Patients and Family Members

The outline below illustrates all of the information that should be conveyed to the patient and family member by someone on the care team in a consistent and understandable manner. In all communication with patients and family members, start by trying to understand their level of health literacy without making any implicit assumptions of their literacy level. Once this literacy level is established, work to communicate in this way in all discussions. See [Healthcare Literacy](#) APSS.

- Equip patients and family members with tools and knowledge needed to be involved in their loved one's care (e.g., provide them with a copy of the care plan, ask to see their notes on their care plan, help them to maintain a log of assessments that should be and were conducted etc).
- Before providing information, ask how the patients and family members prefer to learn (e.g., verbal discussion, writing, etc) and accommodate as much as possible (e.g., with pamphlets, etc).
- Explain why a catheter is needed and what is involved in insertion. Ensure the patients do not misinterpret catheter insertion with a sexual procedure.
- Discuss what the care team is doing to prevent infection and how the patient and family

members can get involved in prevention with tangible examples (e.g., wash hands, don't touch the urine collection bag, etc).

- Explain how long the catheter is expected to remain in place, the anticipated date of removal, and any updates in the days leading up to removal. Make the information specific to their circumstance (e.g., "Based on your scheduled procedure, the catheter use may be increased by \_\_\_ day(s)").
- Explain the importance of removing the catheter as soon as possible and the implications of leaving the catheter in for extended periods of time, whether in the hospital or upon discharge.
- Indicate what patients and family members can watch out for. Patients and family members may be able to detect and raise a concern if:
  - o The catheter has been in for a long time. (Ensure patients and family members are clear about 'how long is long').
  - o They witness a lack of hand hygiene before manipulating the catheter (e.g., touching the door handle with gloves already on before manipulating the catheter)
  - o The position of the urine bag is not below the level of the bladder
  - o The catheter tubing is twisted
  - o The bag needs to be emptied or if the bag is about to overflow
  - o There's blood in the urine
  - o A sterile pack is not used before catheterization (Explain what a sterile 'pack' looks like before making this recommendation)
  - o There's a lack of daily care from the care team

Instead of employing a directive conversation style, an active, engaging conversation should take place, leaving capacity for questions and repeat-back strategies. When patients and family members understand the signs and symptoms that could be indicative of a problem, they are able to serve as an extra set of eyes in order to elevate this concern as early as possible.

Questions patients and family members might ask:

- "Is this catheter necessary?"
- "How long will this catheter remain in place?"
- "Are there alternative methods?"
- "Why do I have a urinary catheter in place?"

### **Resources for CAUTI Patient and Family Member Education:**

- [Discharge Instructions: Caring for Your Suprapubic Catheter](#)
- [Newton-Wellesley Hospital: Using a Foley Catheter and Instructions Post-Discharge](#)
- [The Patient's Perspectives Series: Preventing Catheter-associated Urinary Tract Infections video](#)



# Performance Improvement Plan

Follow this checklist if the leadership team has determined that a performance improvement project is necessary:

- Gather the right project team.** Be sure to involve the right people on the team. You'll want two teams: an oversight team that is broad in scope, has 10-15 members, and includes the executive sponsor to validate outcomes, remove barriers, and facilitate spread. The actual project team consists of 5-7 representatives who are most impacted by the process. Whether a discipline should be on the advisory team or the project team depends upon the needs of the organization. Patients and family members should be involved in all improvement projects, as there are many ways they can contribute to safer care.

## Complete this Lean Improvement Activity:



Conduct a [SIPOC](#) analysis to understand the current state and scope of the problem. A SIPOC is a lean improvement tool that helps leaders to carefully consider everyone who may be touched by a process, and therefore, should have input on future process design.

### RECOMMENDED CAUTI IMPROVEMENT TEAM

- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>• Bedside nurses</li><li>• Nursing leaders</li><li>• Nursing assistants</li><li>• Physicians</li><li>• Surgery staff</li><li>• Physical and occupational therapists</li><li>• Environmental service staff</li><li>• Engineering staff</li><li>• Pharmacists</li><li>• Infection control specialists</li><li>• Epidemiologist</li><li>• Patient transportation services/lift team members</li><li>• Radiology</li></ul> | <ul style="list-style-type: none"><li>• HAI Infection Oversight Committee</li><li>• Clinical educators</li><li>• Information technology</li><li>• Data analysts</li><li>• Quality and safety specialists</li><li>• Patients and family members</li><li>• Admitting and registration staff</li><li>• Residents and students</li><li>• Nurse educators</li><li>• Home health providers</li><li>• Nurse practitioners</li><li>• Clinical nurse specialists</li></ul> |
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Table 1: Understanding the necessary disciplines for a CAUTI project improvement team

- Understand what is currently happening and why.** Reviewing objective data and trends is a good place to start to understand the current state, and teams should spend a good amount of time analyzing data (and validating the sources), but the most important action here is to go to the point of care and observe. Even if team members work in the area daily, examining existing processes from every angle is generally an eye-opening experience. The team should ask questions of the frontline during the observations that allow them to understand each step in the process and identify the people, supplies, or other resources needed to improve patient outcomes.

Create a [process map](#) once the workflows are well understood that illustrates each step and the best practice gaps the team has identified ([IHI, 2015](#)). Brainstorm with the advisory team to understand why the gaps exist, using whichever [root cause analysis tool](#) your organization is accustomed to ([IHI, 2019](#)). Review the map with the advisory team and invite the frontline to validate accuracy.



## CAUTI PROCESSES TO CONSIDER ASSESSING

### General:

- Hand hygiene
- Environmental cleaning/Equipment disinfection

### Teamwork and decision making:

- Routine CAUTI debrief and evaluation (Ohio Hospital Association: CAUTI gap analysis worksheet)
- Documentation and justification of catheter insertion (e.g., standardization of documentation regarding assessment for necessity of catheter, )
- Evaluation of alternative methods aside from catheter use (Gray, Skinner & Kaler, 2016)
- Routine evaluation of catheter necessity (e.g., use of tools like the Houdini Tool, actions after evaluation, etc)
- Diagnosing infection (e.g., roles of the clinician doing the admission assessment versus the clinician diagnosing the infection)

### Processes and standards:

- Peri-care hygiene
- Catheter insertion during surgery and removal thereafter
- Assessment of catheter once placed (e.g., role clarify, standard procedure/checklist followed each time, how urine is assessed, etc)
- Location of urine extraction (e.g., drainage bag, placement port, etc.)
- Management of obstruction
- Catheter positioning (e.g., above level of bladder)
- Position of patient
- Sepsis monitoring
- Auditing of catheter sizes within supply chain and narrowing options for frontline to standardize
- Communication and monitoring mechanism after an equipment change is made
- Data feedback loop after documentation for the unit about their performance

### Person-centeredness:

- Patient and family education and understanding
- Involvement of patients and family members in the hand-off
- Shared decision making with the patient and family members
- Identification of patient needs beyond the current point of care (e.g., socioeconomic needs)
- Disclosure of infection to patient and family member (See CANDOR webinars).

*Table 2: Consider assessing these processes to understand where the barriers contributing to CAUTI may be in your organization*

- Prioritize the gaps to be addressed and develop an action plan.** Consider the cost effectiveness, time, potential outcomes, and realistic possibilities of each gap identified. Determine which are a priority for the organization to focus on. Be sure that the advisory team supports moving forward with the project plan so they can continue to remove barriers. Design an experiment to be trialed in one small area for a short period of time and create an action plan for implementation.

### The action plan should include the following:

- Assess the ability of the culture to change and adopt appropriate strategies
- Revise policies and procedures
- Redesign forms and electronic record pages
- Clarify patient and family education sources and content
- Create a plan for changing documentation forms and systems
- Develop the communication plan
- Design the education plan
- Clarify how and when people will be held accountable



## TYPICAL GAPS IDENTIFIED IN CAUTI

### Teamwork and shared responsibility:

- Lack of engagement of atypical disciplines in their role in CAUTI prevention (e.g., patient transport specialists)
- Lack of accountability
- Lack of leadership oversight
- Little organizational focus on CAUTI prevention
- Separation of HAI initiatives (e.g., CAUTI group is separate from CLABSI group, and therefore there may be competing messages from all committees to those on the frontline)
- Expectations are not clearly documented or enforced for each role
- Lack of knowledge sharing with trainees
- Little sharing of outcome with staff doing the work
- Lack of alignment of policies, education, expectations, etc. See 6P's within the "[Creating a Foundation for Safe and Reliable Care](#)" APSS.
- Little awareness of the complications of catheter insertion beyond the single point of care

### Communication and justification:

- Patient leaving surgery and being transported to another facility without adequate communication or lack of standardization between these organizations
- Reasons for insertion beyond reasons that have evidence-based support (e.g., convenience, etc.)
- Inconsistent communication of CAUTI prevention updates or equipment updates
- Inappropriate prolonged duration of catheter use
- Notion that 'one message' is enough with prevention updates or equipment changes
- Poor explanation of 'why' catheter changes are being made
- Lack of follow up after prevention updates and equipment changes
- Inconsistent education of new protocols
- Lack of prompt to defend reason for continued catheter placement

### Resources and environment:

- Lack of availability of materials for indwelling catheters and availability of alternative materials
- Resource shortage or lack of availability of resources
- Lack of standardization of substitutions in the event of a resource shortage
- Complex work environment with many distractions
- New or visiting staff members
- Dependent loops in catheter
- Staffing needs
- Poor gauge size standards
- Lack of adequate supplies

Table 3: By identifying the gaps in transfusion processes, organizations can tailor their project improvement efforts more effectively

- Evaluate outcomes, celebrate wins, and adjust the plan when necessary.** Measure both process and outcome metrics. Outcome metrics include the rates outlined in the leadership checklist. Process metrics will depend upon the workflow you are trying to improve and are generally expressed in terms of compliance with workflow changes. Compare your outcomes against other related metrics your organization is tracking.

Routinely review all metrics and trends with both the advisory and project teams and discuss what is going well and what is not. Identify barriers to completion of action

[Read this paper](#) from the Institute for Healthcare Improvement to understand how small local steps



plans, and adjust the plan if necessary. Once you have the desired outcomes in the trial area, consider spreading to other areas ([IHI, 2006](#)).

It is important to be nimble and move quickly to keep team momentum going, and so that people can see the results of their labor. At the same time, don't move so quickly that you don't consider the larger, organizational ramifications of a change in your plan. Be sure to have a good understanding of the other, similar improvement projects that are taking place so that your efforts are not duplicated or inefficient.

#### CAUTI METRICS TO CONSIDER ASSESSING

##### Process Metrics:

- Bundle compliance through rounding and monitoring for unneeded catheters
- Ongoing surveillance for patients at risk for CAUTI (number of patients with an indwelling catheter)
- Number of cases for which a root cause analysis was conducted
- Variation in ongoing surveillance process (e.g., variations in time conducted each day)
- Appropriate documentation (manual, electronic or both) to determine those at risk for CAUTI

##### Outcome Metrics:

- Number of infections identified from ongoing surveillance

##### Comparative Outcomes:

- Hand hygiene compliance
- Antibiotic use
- Sepsis cases
- Cases of urethral stenosis
- Patient comfort
- Falls
- CAUTI-related complications, such as urosepsis
- ICU LOS
- Environmental cleaning audits
- Compliance with patient education measures
- Catheter utilization ratio

*Table 4: Consider evaluating related metrics to better understand CAUTI presence and contributing factors. Use the [NHSN's Standardized Infection Ratio](#).*

## What We Know About Catheter-associated Urinary Tract Infections (CAUTI)

### Catheter-Associated Urinary Tract Infections (CAUTI)

A UTI is an infection involving any part of the urinary system, including urethra, bladder, ureters, and kidneys. Urinary tract infections are one of the most common HAIs, accounting for up to 40% of infections reported in acute care hospitals ([Edwards et al., 2009](#)).

CAUTIs are a frequent cause of harm and death in US hospitalized patients. Of all reported UTIs acquired in hospitals, up to 80% are associated with a urinary catheter—a thin, flexible tube put in a patient's body to drain the urine from their bladder ([Apisarnthanarak et al., 2007](#)).

Physicians may recommend a catheter placement if the patient:

1. Can't control urination
2. Is incontinent

### 3. Experiences urinary retention

## Patient Populations at Risk

Those at higher risk for CAUTIs include (Gillen et al., 2015):

- Females
- Adults ages 65 and older
- Those with diabetes mellitus
- Those with cardiogenic shock
- Those undergoing an urgent operation
- Those with blood cell transfusions
- Those with a prolonged ICU stay

## Epidemiology

The source of the bacteria that cause CAUTIs may come from:

- Endogenous factors, such as from meatal, rectal, or vaginal colonization
- Exogenous factors, usually through contaminated hands of healthcare staff during catheter insertion or when changing the urine collecting system

Researchers suggest that CAUTIs develop (Maki & Tambyah, 2001):

- By capillary action
- When there's a break in the closed drainage tubing
- By contamination of the collection urine bag

Duration of catheterization is the leading risk factor for CAUTI. Nearly 95% of UTIs in the ICU are associated with urinary catheters. The precursor to CAUTI, known as bacteriuria, develops rapidly, with an average daily rate of 3% to 10%. Over a quarter of patients with a catheter in place for 2 to 10 days develop bacteriuria growth, and almost all patients with catheters for over 1 month develop bacteriuria. Therefore, catheterization for over one month is typically deemed long-term catheterization ([Chenoweth & Saint, 2013](#)).

In addition to the duration of catheter use, the inappropriate distribution of antibiotics can cultivate circumstances which may contribute to CAUTI. It is estimated that up to 50% of antibiotics prescribed today are unnecessary or inappropriate. This rampant misuse significantly contributes to the growth of multidrug resistant organisms.

## Clinical Implications

There are an estimated 560,000 diagnosed UTIs in US hospitals each year, with a projected cost of \$450 million ([Klevens et al., 2007](#)).

Healthcare-associated UTI frequency among all other HAIs is 12.9%, 19.6%, and 24% in the US, Europe, and developing countries, respectively ([Tandogdu & Wagenlehner, 2016](#)). In the UK specifically, CAUTIs are associated with 45,717 additional bed-days and 1,467 deaths ([Smith et al., 2019](#)).

According to a 2008 survey of US hospitals, more than 50% of hospitals did not monitor which patients were catheterized and 75% did not monitor duration and discontinuation ([Saint et al., 2008](#)). This statistics are alarming because when left unattended, CAUTI can quickly lead to other complications including urosepsis, septicemia, prostatitis, epididymitis, orchitis, cystitis, pyelonephritis, gram-negative bacteremia, endocarditis, vertebral osteomyelitis, septic arthritis, endophthalmitis, and meningitis ([CDC, 2020](#)).

## Financial Implication

Each CAUTI incident is associated with a cost of approximately \$758 and cumulatively, a total of between \$340 and \$450 million is spent annually to treat CAUTI incidents in the US alone ([CDC & NHSN, n.d.](#)). Furthermore, CAUTIs are considered to be a preventable complication of hospitalization by the Centers for Medicare and Medicaid Services. As such, no additional payment is provided to hospitals for CAUTI treatment-related costs.

From an international perspective, in the UK, for example, total CAUTI-related direct hospital costs were estimated at £54.4 million ([Smith et al., 2019](#)).

## Resources



- [NHS: Urinary Catheter Care Guidelines with Competency Checklists](#)
- [WHO: Prevention of CAUTI Student Handbook](#)
- [Ohio Hospital Association: CAUTI gap analysis worksheet](#)
- [AHRQ: Toolkit for Reducing CAUTI in Hospital Units](#)
- [CDC: Comparison of Alternative Methods to Indwelling Catheters](#)
- [External Collection Devices as an Alternative to the Indwelling Urinary Catheter: Evidence-Based Review and Expert Clinical Panel Deliberations](#)
- [Strategies to Prevent Catheter-Associated Urinary Tract Infections in Acute Care Hospitals: 2014 Update](#)
- [AHRQ: Long Term Care CAUTI Surveillance Worksheet](#)
- [PatientCareLink: CAUTI Implementation, Action Plan, and Rounding Worksheets](#)
- [Houdini Tool Catheter Removal Protocol](#)

## For General Improvement:

- [CMS: Hospital Improvement Innovation Networks](#)
- [IHI: A Framework for the Spread of Innovation](#)
- [The Joint Commission: Leaders Facilitating Change Workshop](#)
- [IHI: Quality Improvement Essentials Toolkit](#)
- [SIPOC Example and Template for Download](#)
- [SIPOC Description and Example](#)

# Endnotes

## Conflicts of Interest Disclosure

The Patient Safety Movement Foundation partners with as many stakeholders as possible to focus on how to address patient safety challenges. The recommendations in the APSS are developed by workgroups that may include patient safety experts, healthcare technology professionals, hospital leaders, patient advocates, and medical technology industry volunteers. Workgroup members are required to disclose any potential conflicts of interest.

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