Preventing Catheter-Associated Urinary Tract Infections (CAUTI)

Cal HQ Change Package 2026

Cal HQ

About Cal HQ

California Alignment for Hospital Quality (Cal HQ) is a statewide collaboration focused on improving hospital quality through aligned action. The initiative is led by Covered California, CalPERS, and Cal Healthcare Compare, with oversight from steering committee members from state agencies, hospitals, health plans, improvement organizations, and patients to identify and advance a common set of hospital quality measures. The Cal HQ Steering Committee provides strategic guidance, ensures industry alignment, promotes Cal HQ's activities, and advises on statewide scaling and dissemination efforts.

Prevent 2,000 Infections over two years

34% overall reduction by 2027

Projected to potentially save approximately $64 million

Projected to potentially save 120 lives

About this Change Package

Change packages are tools to help health care improvement teams make patient care safer and improve outcomes. This change package, developed by a team of experts in patient safety and infection prevention, outlines evidence-based practices. It includes a menu of strategies, change ideas, and specific, actionable steps that your team can implement in your unique context.

All Cal HQ change packages are organized around a driver diagram, a tool to identify, organization, and prioritize improvement activities. Each primary driver has accompanying focus area (called secondary drivers) and change ideas, or specific actions that a hospital team can take to improve outcomes.

Use this change package as background information, a checklist, reference material or simply a place to start. Learn more about other Cal HQ resources on our website: www.calhq.calhospitalcompare.org.

Part 1: Definition and Scope

What is a CAUTI?

A urinary tract infection (UTI) is an infection involving any part of the urinary system, including urethra, bladder, ureters and/or kidney. A catheter-associated urinary tract infection (CAUTI) occurs when the UTI is deemed to be associated with an indwelling urinary catheter, a device placed in the bladder through the urethra to drain urine, which is secured in place by a small balloon that is inflated to keep the catheter in place. When a urinary catheter is not inserted properly, not maintained properly, or left in a patient for too long, infection can occur. A critical risk factor in developing a catheter-associated urinary tract infection is the length of time the catheter is in place. Current evidence validates that indwelling urinary catheters should only be used or appropriate indications and should be removed as soon as the patient no longer requires the catheter for such indications[1].

Magnitude of the Problem

Urinary tract infections are the most common type of health care-associated infection reported to the National Healthcare Safety Network (NHSN), accounting for more than 30 percent of health care-associated infections reported.[1] Over the past decade, CAUTI rates in U.S. acute care hospitals have generally declined, which may be attributed both due to prevention efforts and changes to surveillance definitions[2]. During the COVID-19 pandemic, hospitals across the country experienced a temporary increase in CAUTI rates, likely due to increased catheter use and disruptions to infection control practices. However, rates have now resumed their downward trend after the pandemic subsided[3].

Despite these declines, CAUTIs remain a significant concern. According to the CDC, acute care hospitals reported more than 17,000 CAUTIs in 2023. Virtually all CAUTIs are associated with an indwelling catheter, and many of these infections are preventable[4].

In addition to being vulnerable to CAUTI, a patient with an indwelling urinary catheter is exposed to increased risk of harm from other sources. In a 2002 editorial, Saint described the urinary catheter as a "one-point restraint," keeping the patient bedridden, and increasing risk hospital-acquired pressure ulcers and consequences of immobility (e.g., falls and venous thromboembolism (VTE).[5]

Finally, CAUTIs are costly. The CDC estimates that a CAUTI is associated with an excess length of stay of two to four days. The Agency for Healthcare Research and Quality

estimates the excess cost per patient associated with a CAUTI is approximately $1,000.8 Nationally, CAUTIs are associated with an increased cost of $400 million to $500 million annually.[6]

Part 2: Measurement

A key strategy for making patient care safer in your hospital is to track your progress toward improvement. Collecting data points at your hospital will guide your quality improvement efforts as part of the Plan-Do-Study-Act (PDSA) process. Tracking your data in this manner will provide valuable information needed to study your data across time and help determine the impact of your improvement initiatives on reducing patient harm.

Nationally Recognized Outcome Measures

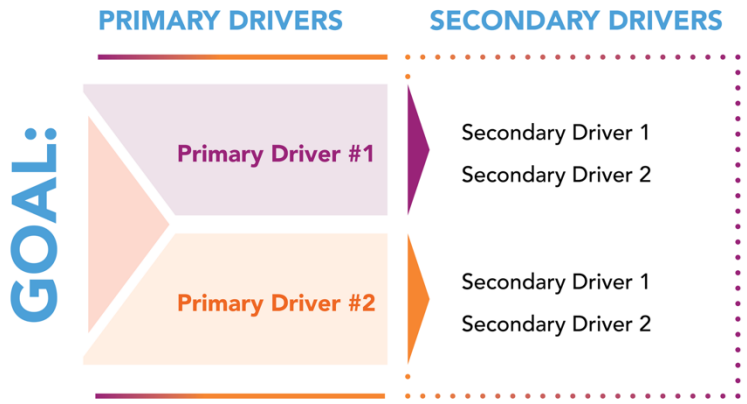
- CAUTI Rate
  - Numerator: CAUTI events
  - Denominator: Urinary catheter days
- CAUTI Standardized Infection Ratio (SIR)
  - Numerator: Observed CAUTI events
  - Denominator: Predicted CAUTI events
  - *SIR is calculated by NHSN and adjusted for several risk factors.*
- Standardized Utilization Ratio (SUR)
  - Numerator: Observed number of urinary catheters
  - Denominator: Predicted number of urinary catheters
  - *SUR is calculated by NHSN and adjusted for several risk factors*
- Urinary Catheter Utilization Ratio:
  - Numerator: Urinary Catheter days
  - Denominator: Patient days
- Cumulative Attributable Differences
  - Numerator: Observed number of CAUTIs
  - Denominator: Prevention target (predicted CAUTIs x SIR goal)
  - This is calculated by NHSN and may assist in identifying where the greatest need for infection prevention lies by identifying the number of infections that should be prevented.

Part 3: How to Improve

Investigate Your Problem and Implement Best Practices

Driver Diagrams

A driver diagram visually demonstrates the causal relationship between change ideas, secondary drivers, primary drivers, and your overall aim. A description of each of these components is outlined in the table below. This change package is organized by reviewing the components of the driver diagram to (1) help your care team identify potential change ideas to implement at your facility and (2) show how this quality improvement tool can be used by your team to tackle new process problems.



Suggested Bundles and Toolkits

Toolkit for Reducing CAUTI in Hospitals, AHRQ

Implementation Guide, APIC

BladderSafe

CAUTI Basics, CDC

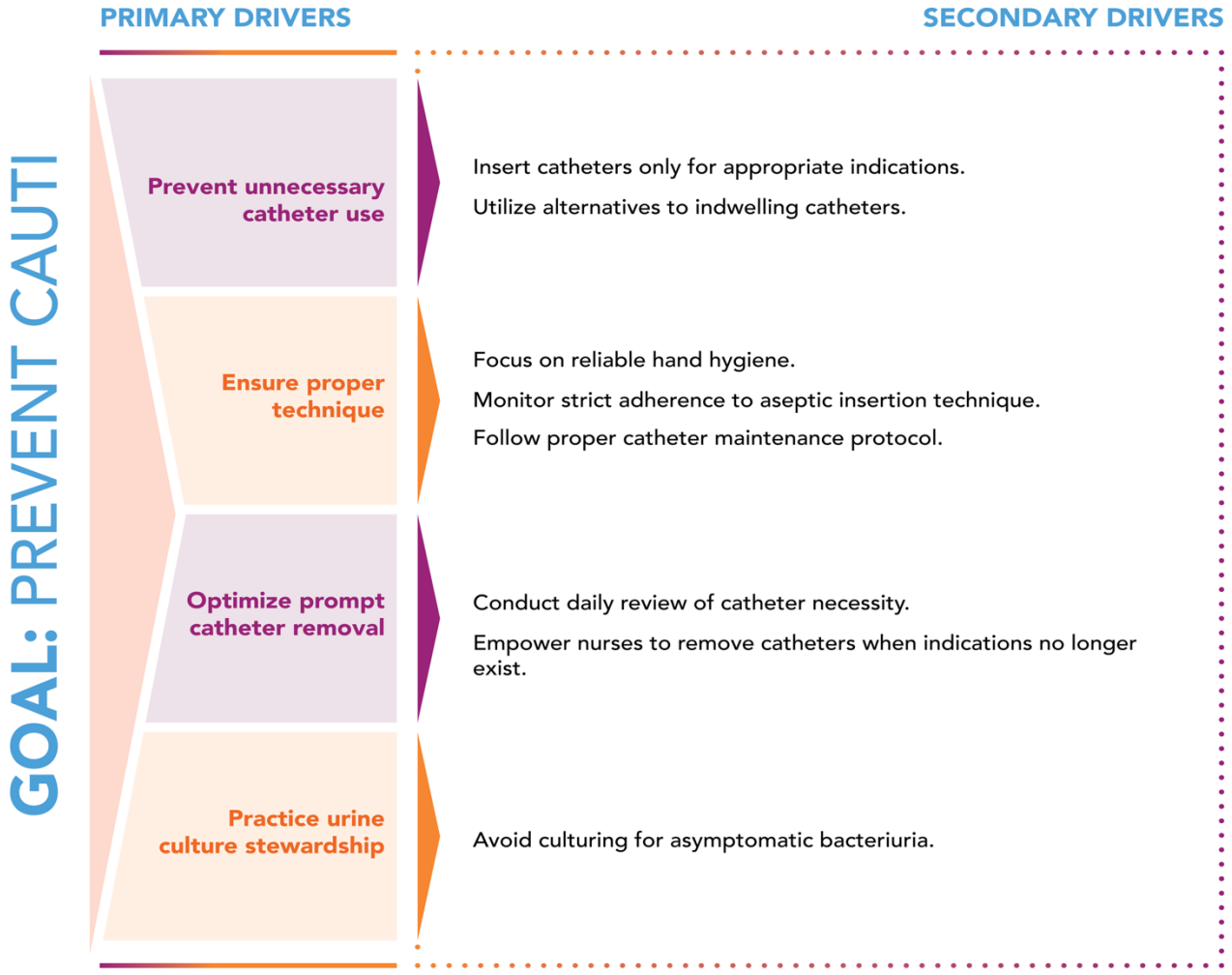
A Tiered Approach for Preventing Catheter Associated Urinary Tract Infection

AIM: A clearly articulated goal or objective describing the desired outcome. It should be specific, measurable and time-bound.

PRIMARY DRIVER: System components or factors that contribute directly to achieving the aim.

SECONDARY DRIVER: Action, interventions or lower-level components necessary to achieve the primary driver.

Drivers in this Change Package



Foundational Infection Prevention Practices

This change package builds on foundational infection prevention and control practices that are a crucial component of safe and quality health care delivery:

- Leadership support
- Health care personnel education and training
- Patient, family and caregiver engagement
- Surveillance
- Hand hygiene
- Environmental cleaning and disinfection

You can learn more about these practices in the **Foundational Infection Prevention Practices Change Package**: https://calhq.calhospitalcompare.org/wp-content/uploads/2026/02/CalHQ_FoundationalIPC_TOOLKIT.pdf

Driver 1: Prevent Unnecessary Urinary Catheter Use

Decreasing catheter use by evaluating appropriate indications for placement and reducing the length of time a catheter is in place is the hallmark of successful CAUTI reduction programs.

Secondary Drivers in this Section

1. Insert catheters only for appropriate indications.
2. Utilize alternatives to indwelling catheters.

1. Insert catheters only for appropriate indications.

The Centers for Disease Control and Prevention (CDC) Healthcare Infection Control Practices Advisory Committee (HICPAC) Guidelines for Prevention of Catheter-Associated Urinary Tract Infections (2009) recommend inserting catheters only for appropriate indications.[7]

Change Ideas

- Engage clinical champions to develop facility-wide criteria for acceptable indications for placement, guided by the expert, consensus-driven recommendations from HICPAC and SHEA (Appendix II).
- Create written policies and accompanying visual cues to reinforce the appropriate indications for indwelling catheters.
- Involve interprofessional teams of clinicians who place indwelling catheters in improvement efforts to reduce unnecessary catheter placement in all areas of the hospital.[8]
- Use strategies to engage clinicians regarding appropriate indications, particularly in targeted departments (e.g., ED, OR, ICU) and medical and surgical specialties.[9]
- Require clinicians to document indication in the EHR.[10]
- Restrict access to indwelling catheter kits in the emergency room (e.g., dispense from medication or supply dispensing machine).
- Collect, analyze and display data transparently related to indwelling catheter placement.
- Celebrate successful reduction in catheter placement at unit and organizational levels.
- Test strategies to reinforce peer-to-peer communications, teamwork, and mutual support regarding appropriate indications using TeamSTEPPS tools, such as

CUS and the Two-Challenge Rule.[11]

Suggested Process Measures for Your Tests of Change

- Percentage of patients with a urinary catheter who meet appropriate criteria for placement
- Frequency of indication for urinary catheter
- Patient location at time of insertion
- Compliance with documenting indication at insertion

2. Utilize alternatives to indwelling catheters

Consider alternatives to indwelling catheters based on a patient's individual care needs.

Change Ideas

- Stock intermittent/straight catheters, external "condom" catheters, female external catheters, beside commodes, urinals and incontinence garments and other supplies to manage incontinence in EDs, ICUs, and other high use areas.
- Institute organizational catheter supply management strategies to make stocked alternatives easier to find and use.
- Utilize nurse-driven protocols in emergency room, intensive care unit, operating room and floors that include criteria for insertion based on appropriate indication of use (Appendix III).
- Consider nurse-driven protocols for voiding trials and/or bladder scanning for patients with urinary retention.[12]
- Engage nurses and physicians in dialogue regarding use of catheter alternatives, barriers, and availability of supplies during leadership rounds, particularly in the emergency department and intensive care unit.
- Implement hourly rounding with programmed toileting (e.g., utilizing scripting to include assisted toileting or toileting reminders).
- Involve front-line staff in evaluating current urinary catheter alternatives and in the selection and testing of new products.

Suggested Process Measures for Your Tests of Change

- Percentage of patients with an external urinary catheter documented prior to an invasive urinary catheter.

Patient and Family Engagement Opportunity

Use the teach-back method to educate patients and families about the steps being taken to minimize the risk of CAUTI. Explain the purpose of the indwelling urinary catheter, the current indications for use, the expected duration, catheter alternatives, and why it is important to remove it as soon as possible.

The greatest opportunity for patient and family engagement in preventing CAUTI comes in the daily review of catheter necessity. When patients and families understand the risks of CAUTI and participate in the dialogue about whether indications for the catheter still exist, care providers can raise other issues important to patient safety, such as progressive mobility and care planning.

Driver 2: Ensure Proper Technique

Proper urinary catheter insertion technique, including hand hygiene and following appropriate maintenance practices, are essential for CAUTI prevention.

Secondary Drivers in this Section

1. Focus on reliable hand hygiene.
2. Monitor strict adherence to aseptic insertion technique.
3. Follow proper catheter maintenance protocol.

1. Focus on reliable hand hygiene.

Hand hygiene is the single most effective way to reduce the transmission of health care-acquired infections. Clinicians should follow the Centers for Disease Control and Prevention[13] or the World Health Organization guidelines[14] for hand hygiene in health care settings prior to insertion or conducting catheter maintenance.

Change Ideas

- Perform hand hygiene immediately before and after insertion or any manipulation of the catheter device or site.
- Utilize "secret shopper" hand hygiene observers (e.g., trained nursing students or volunteers) to capture reliable adherence rates.
- Optimize reliable approaches to hand hygiene surveillance, monitoring, measurement and reporting.
- Integrate personal and team accountability for hand hygiene adherence into unit level and organizational performance measures.
- Review and update hand hygiene policy and procedure, along with education programs and competency assessments.
- Ensure adequate availability of supplies and equipment, including locations of sinks and hand sanitizers.
- Create visual cues and staff signals to provide adequate reminders and cross monitoring.

Suggested Process Measures for Your Tests of Change

- Hand hygiene adherence measure (NHSN)
- Percentage of observation in which hand hygiene was performed consistent with guidelines.

2. Ensure strict adherence to aseptic technique.

Strict adherence to proper aseptic insertion principles includes use of sterile gloves, drape, a sterile antiseptic solution for cleaning the urethral meatus, and a sterile single-use packet of lubricant jelly for insertion.

Change Ideas

- Use aseptic insertion technique and sterile equipment with standard precautions including hand hygiene, barrier precautions, and gloves.
- Institute a practice of having a second person assist the individual inserting the catheter to support strict aseptic technique.
- Utilize the smallest gauge catheter possible to minimize urethral trauma.
- Properly secure the catheter after insertion to prevent movement and urethral traction.
- Check for unobstructed flow by making sure there are no kinks and that the drainage bag is lower than the level of the bladder

Suggested Process Measures for Your Tests of Change

- Percentage of nurses with documented catheter insertion competency
- Percentage of patients with the smallest gauge catheter in place
- Percentage of insertions in which all elements were documented as compliant

3. Follow proper catheter maintenance protocol.

Principles of proper catheter maintenance includes maintaining unobstructed urine flow in a closed drainage system. The backflow of urine into the tubing or bladder increases the risk of infection.

Change Ideas

- Avoid breaks in the closed catheter system.
- Obtain urine samples aseptically.
- Avoid irrigation for purpose of preventing infection.
- Maintain proper urine flow, with no kinks, and ensure the bag is lower than the bladder.
- Do not rest the bag on the floor or place it upon the bed at any time.
- Do not routinely change indwelling catheters or urinary drainage bags.
- Educate all staff and family who care for or transport catheterized patients.
- Use Standard Precautions during manipulation of the catheter or collecting system.

Suggested Process Measures for Your Tests of Change

- Percentage of nurses with documented catheter maintenance competency
- Percentage of patients with indwelling urinary catheters that demonstrate proper maintenance elements (by observation)
- Percentage of transported patients with indwelling catheters who have urinary bag secreted below level of the bladder during transport (by observation)

Driver 3: Optimize Prompt Catheter Removal

A systematic review in hospitalized patients reported that the use of an intervention including a reminder to staff that a catheter was in place and/or an order to prompt removal of unnecessary catheters reduced the CAUTI rate by 53 percent.[15] "Forgotten" catheters may remain in place long after indications exist. Prolonged catheterization is the strongest risk factor for development of a CAUTI.

Secondary Drivers in this Section

1. Conduct daily review of catheter necessity.
2. Empower nurses to remove catheters when indications no longer exist.

1. Conduct daily review of catheter necessity.

Change Ideas

- Use reminders interventions (such as visual cues, verbal or written reminders, EHR alerts) to ensure that every member of the interprofessional team knows which patients have indwelling catheters.
- Implement daily interprofessional rounds to include a review of current need for indwelling catheter.
- Create electronic or written reminders to be used on rounds to indicate the presence of a catheter, and a prompt to document continued and appropriate indications.[16]
- Ask a scripted question to confirm indication for continued use.
- Incorporate critical uses of hourly urine output into rounding checklists (e.g., need for management of hemodynamic instability requiring hourly titration of medications, acute respiratory failure requiring invasive ventilation with hourly titrations of medical and respiratory therapies, or hourly measurement for urine studies or urine volumes to manage life-threatening abnormalities).[17]
- Coach staff on ways to suggest alternatives when indications no longer exist.
- Integrate catheter indication in patient hand-off communication.[18]

Suggested Process Measures for Your Tests of Change

- Percentage of patients in which daily indication was documented for urinary catheters
- Average urinary catheter days

2. Empower nurses to remove catheters when indications no longer exist.

Nursing engagement and empowerment is crucial for a successful CAUTI prevention strategy. Such engagement links directly to a culture of safety generated from the leaders of the organization. Nurse-driven protocols on paper will have little value if nurses perceive that they may be chastised by a physician or supervisor for using such protocols.

Change Ideas

- Convene an interprofessional CAUTI team, including clinician champions (such as infectious disease physicians, hospitalists, surgeons, urologists), as well as front-line nurses, nursing educators and nursing leaders, to design and support nurse-driven strategies to reduce CAUTI.[19]
- Implement "stop orders" that prompt the clinicians (physician and/or nurse) to remove the catheter by default after a certain time or when a set of clinical conditions has occurred (such as 24 or 48 hours post-operatively).
- Develop CAUTI unit champions.
- Collect, segment by unit, analyze, and share data regarding catheter utilization rates, CAUTI and use of nurse-driven protocols.
- Celebrate CAUTI reduction successes at the unit level and recognize and reward nurses for "good catches" on prompt CAUTI removal.
- Post a stop sign on the door exiting the PACU and ICU asking nurses to double check catheter necessity prior to patient transfer to a medical surgical unit.
- Involve clinicians in CAUTI root cause analysis to understand barriers to prompt removal.

Suggested Process Measures for Your Tests of Change

- Percentage of nursing staff trained on appropriate urinary catheter indication and removal.
- Percentage of urinary catheters removed due to initiation of a nurse-driven protocol.

Driver 4: Practice Urine Culture Stewardship

Secondary Drivers in this Section

1. Avoid culturing for asymptomatic bacteriuria (ASB).

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"Asymptomatic bacteriuria" (ASB) is the condition of having a specified count of bacteria in an appropriately collected urine sample obtained from a person without clinical signs and symptoms of a urinary tract infection. When clinicians order antibiotics to treat ASB, this contributes to an overuse of antibiotics that can potentially cause complications in the individual patient. This includes a higher risk of C. *difficile* infection and greater antimicrobial resistance. Over-culturing may lead to a falsely inflated CAUTI rate as bacteremia is unnecessarily treated.

Change Ideas

- Educate front-line staff about ASB and the harm of overtreating it.
- Engage physicians in applying the evidence-based guidelines for identifying clinical signs and symptoms of infection. Positive cultures will exist for ASB and CAUTI, so it is not always easy to distinguish.
- Consider implementing algorithms to assist with evaluation of catheterized patients with cloudy, foul-smelling urine for signs of infection before culturing (e.g., fever, acute hematuria, delirium, rigors, flank pain, burning, pelvic discomfort, urgency, frequency, dysuria, suprapubic pain).
- Implement triggers for lab and/or infectious disease review of urine cultures ordered without documented signs of infection.
- Collect and analyze data by ordering provider optimizing opportunities for peer discussion and targeted physician education regarding culturing and the use of antibiotics for ASB.
- Drive out the "culture of culturing" for ASB and link to organizational antimicrobial stewardship programs.[20,21]
- Increase transparency for CAUTI rates and catheter utilization, emphasizing that unnecessary urine cultures that identify ASB as CAUTI may result in over-counting organizational CAUTI rates

Suggested Process Measures for Your Tests of Change

- Percentage of patients treated with antibiotics for urinary tract infection who have indwelling catheter and no documented signs or symptoms of clinical infection (ASB)

Patient and Family Engagement Opportunity

- Encourage patients and caregivers to ask each day, "Will my catheter be removed today?"
- Include catheter removal goal on whiteboard and discuss in bedside rounds and change of shift handovers.
- Make available educational materials about urinary catheters, such as the CDC's Frequently Asked Questions About Catheter-associated Urinary Tract Infections, available here: www.cdc.gov/uti/about/cauti-basics.html

PDSA IN ACTION

Tips on How to use the Model For Improvement

Choice of Tests and Interventions for CAUTI Reduction

- Test a rounding checklist for daily review of urinary catheter necessity

Implement Small Tests of Change

Test a System for Daily Review of Urinary Catheter Necessity

PLAN | Using the HICPAC guidelines, develop a small group of interprofessional team members to develop a criteria-based rounding tool for testing.

DO | Select one nurse and one intensive care physician to test the criteria checklist during rounds on patients on one day.

STUDY | Conduct a debrief with other members of the interprofessional team. Evaluate which criteria were the most common indicators cited for continued use of an indwelling catheter. If the primary reason for continued catheterization was the need for accurate urinary output on a critically ill patient, query the staff to see how that urine output data is utilized for care decisions.

ACT | Using feedback from the debrief and the resulting chart review, adapt the rounding list to reflect follow up questions regarding indications. Plan the next test of change during the following day's interprofessional rounds.

Common Challenges to Improvement

- Despite numerous national CAUTI improvement efforts, many hospitals continue to struggle with reducing catheter utilization and CAUTI rates. Complex factors and long-standing care protocols are often difficult to change.
- Increasing daily awareness of which patients have catheters and whether they still meet appropriate indications requires an interprofessional, team-based approach. Work compression and time barriers may get in the way of creating the necessary dialogue between physicians, nurses, and other professionals regarding steps for early catheter removal.
- Nurses may have concerns that if an indwelling catheter is removed, incontinent patients may develop moisture-related skin injuries. Alternatives to indwelling catheters may not be readily available, and even if they are, staff may lack knowledge and competencies regarding appropriate usage.

Action Planning

Reducing catheter-associated urinary tract infections, and the related measures of catheter utilization, in hospitals across California will require new ways of looking at complex care issues. The inappropriate use of indwelling urinary catheters has the potential to not only cause CAUTIs, but also harm that may result from immobility (such as VTE, falls, pressure ulcers.) Understanding CAUTI prevention as a system safety measures will allow your organization to engage multiple professionals and other staff. The key is to begin with one of the primary drivers in this change package, test changes to see whether they result in improvement, and then build to broader testing and spread. The Top Ten Checklist for CAUTI Prevention (Appendix 1) provides a comprehensive approach to addressing CAUTI prevention.

Part 5: Appendices

Appendix 1: CAUTI Top Ten Checklist

Purpose of Tool: A checklist to review current or initiate new interventions for CAUTI prevention in your facility.

- ☐ Insert indwelling urinary catheters only for clinically appropriate reasons. Involve clinicians in all units where catheters are commonly inserted, including ED, ICU and surgical procedure units.
- ☐ Promote use of alternatives to indwelling catheters such as external catheters, bladder scanners, intermittent catheterization, optimal incontinence products, prompted toileting and use of urinals, bedside commodes, and daily weights as alternative methods to collect and measures.
- ☐ Ensure proper aseptic insertion and maintenance technique involving hand hygiene, soap and water perineal care, strict adherence to aseptic catheter insertion steps, catheter securing, no kinds, bag lower than bladder, and avoid breaks in closed system. Do not routinely change catheters. Educate all staff and family that care for or transport catheterized patients.
- ☐ Optimize prompt removal of urinary catheters that are not clinically indicated. Conduct daily review of catheter necessity, with consideration of nurse empowerment to remove by default if no longer clinically indicated.
- ☐ Culture only when symptomatic. Do not culture because of odor, color, cloudiness, or simply because of prolonged catheter use.
- ☐ Perform root cause analysis on all CAUTIs to identify root causes and contributing factors. Evaluate and discuss with interprofessional team to identify systems issues and practice gaps related to unnecessary or improper catheter use.
- ☐ Provide transparent feedback to providers and staff regarding hospital-wide and unit-specific infection and catheter utilization data.
- ☐ Observe and document competency and provide real-time feedback of catheter insertion and maintenance on a routine basis.
- ☐ Conduct regular catheter rounds with targeted education to reduce inappropriate use and clarify interpretations of appropriateness criteria.
- ☐ Encourage and expect staff, patients, and families to speak up and consider hand hygiene as an "always event," as well as to inquire about the daily necessity of indwelling urinary catheters.

Appendix II: HICPAC Catheter Indications

Centers for Disease Control and Prevention, Healthcare Infection Control Practices Advisory Committee

Purpose of Tool: Examples of appropriate indications for indwelling urethral catheter use.

Reference: Centers for Disease Control and Prevention, https://www.cdc.gov/infection-control/hcp/cauti/summary-of-recommendations.html

Example of Appropriate Indications for Indwelling Urethral Catheter Use

1. Patient has acute urinary retention or bladder outlet obstruction.
2. Need for accurate measurement of urinary output in critically ill patients.
3. Perioperative use for selected surgical procedures:
    - Patients undergoing urologic surgery or other surgery on contiguous structures of the genitourinary tract.
    - Anticipated prolonged duration of surgery (catheters inserted for this reason should be removed in PACU)
    - Patients anticipated to receive large-volume infusions or diuretics during surgery
    - Need for intraoperative monitoring of urinary output
4. To assist in healing of open sacral or perineal wounds in incontinent patients
5. Patient requires prolonged immobilization (e.g., potentially unstable thoracic or lumbar spine, multiple traumatic injuries such as pelvic fractures)
6. To improve comfort for end of life care if needed

Note: These indications are based primarily on expert consensus.

Appendix III: External Catheter Indications

Agency for Healthcare Research and Quality (AHRQ)

Purpose of Tool: Examples of appropriate indications for external urethral catheter use.

Reference: AHRQ Toolkit for Reducing Catheter-Associated Urinary Tract Infections in Hospital Units: Implementation Guide

External catheters are appropriate for the following indications:

- Stage III or IV or unstageable pressure ulcers or similarly severe wounds of other types that cannot be kept clear of urinary incontinence despite wound care and other urinary management strategies
- Moderate to severe incontinence-associated dermatitis that cannot be kept clear of urine despite other urinary management strategies
- Urinary incontinence in patients for whom nurses find it difficult to provide skin care despite other urinary management strategies and available resources, such as lift teams and mechanical lift devices
- Daily (not hourly) measurement of urine volume that is required to provide treatment and that cannot be assessed by other volume and urine collection strategies
- Single 24-hour or random urine sample for diagnostic testing that cannot be obtained by other urine collection strategies
- Reduction in acute, severe pain with movement when other urine management strategies are difficult
- Patient request for external catheter to manage urinary incontinence while hospitalized
- Improvement in comfort when urine collection by external catheter addresses patient and family goals in a dying patient

References

1. Centers for Disease Control and Prevention (CDC). Catheter-associated Urinary Tract Infection (CAUTI) Basics). Last accessed January 9, 2026.
2. Soe, M., Li, Q., Nkwata, A., Dudeck, M., & Edwards, J. (2020). *National trends of incidence of catheter-associated urinary tract infections in acute-care hospitals. Infection Control & Hospital Epidemiology, 41*(S1), s327.
3. Sleziak, J., Błażejewska, M., & Duszyńska, W. (2025). *Catheter-associated urinary tract infections in the intensive care unit during and after the COVID-19 pandemic*. BMC Infectious Diseases, 25, Article 595. https://doi.org/10.1186/s12879-025-10996-2
4. Centers for Disease Control and Prevention. (2025, January). *Urinary tract infection (catheter-associated urinary tract infection [CAUTI] and non-catheter-associated urinary tract infection [UTI]) events: NHSN patient safety component manual, Chapter 7* (7psccauticurrent.pdf). U.S. Department of Health and Human Services. https://www.cdc.gov/nhsn/pdfs/pscmanual/7psccauticurrent.pdf
5. Saint S, Lipsky BA, Goold SD. Indwelling urinary catheters: a one-point restraint? (Ed.). Ann Int Med 2002:137(2):125-7. Last accessed December 16, 2016.
6. Agency for Healthcare Research and Quality. Draft Interim Update on 2013 Annual Hospital-Acquired Condition Rate and Estimates of Cost Savings and Deaths Averted from 2010 to 2013. Last accessed February 3, 2021.
7. Centers for Disease Control and Prevention. Catheter-associated Urinary Tract Infection (CAUTI) Toolkit (2010). Last accessed December 28, 2016.
8. Gould CV, Umscheid CA, Agarwal RK, Kuntz G, Pegues DA. Guidelines for prevention of catheter-associated urinary tract infections 2009. Infection Control and Hospital Epidemiology 2010; 31:319-26. Last accessed December 8, 2025.
9. Fakih MG, Pena ME, Shemes S, et al. Effect of establishing guidelines on appropriate urinary catheter placement. Acad Emerg Med 2010; 17:337-40. Last accessed December 20, 2016
10. Strategies for Physician Engagement. Choosing Wisely Campaign. Last accessed February 2026.
11. Agency for Healthcare Research and Quality. Team Strategies & Tools to Enhance Performance &Patient Safety (TeamSTEPPS). Last accessed December 1, 2016.
12. Association for Professionals in Infection Control and Epidemiology. (2025). *NEW: Guide to preventing catheter-associated urinary tract infections (2025)*. https://apic.org/implementation_guide/new-guide-to-preventing-catheter-associated-urinary-tract-infections-2025

13. Centers for Disease Control and Prevention. Guideline for Hand Hygiene in Health-Care Settings: Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/SDIS Hand Hygiene Task Force. MMWR 2002;51(no. RR-16).
14. WHO Guidelines on Hand Hygiene in Health Care: First Global Patient Safety Challenge, Clean Care is Safer Care (2009). Last accessed December 20, 2016.
15. Patel PK, Advani SD, Kofman AD, et a. Strategies to prevent catheter-associated urinary tract infections in acute-care hospitals: 2022 Update. Infection Control & Hospital Epidemiology. 2023;44(8):1209-1231. doi: 10/1017/ice.2023.137
16. Meddings J, Rogers MA, Krein SL, Fakih MG, Olmsted RN, Saint S. Reducing unnecessary urinary catheter use and other strategies to prevent catheter-associated urinary tract infection: an integrative review. BMJ Quality & Safety 2013:1-13. Last accessed December 11, 2016.
17. Meddings J, Saint S, Fowler KE, et al. The Ann Arbor criteria for appropriate urinary catheter use in hospitalized medical patients: results obtained by using the RAND/UCLA appropriateness method. Ann Int Med 2015;162: S1-S34. Last accessed December 19, 2016.
18. Patient Safety Enhancement Program. (n.d.). *BladderSafe*. https://www.bladdersafe.org/
19. Oman KS, Makic MBF, Fink R, et al. Nurse-directed interventions to reduce catheter-associated urinary tract infections. American Journal of Infection Control 2012; 40:548-53. Last accessed December 20, 2016.
20. Lindsay NE, et.al. (2019). Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria: 2019 Update by the Infectious Diseases Society of America, Clinical Infectious Diseases, Volume 68, Issue 10, Pages e83–e110, https://doi.org/10.1093/cid/ciy1121
21. Trautner BW, Grigoryan L, Petersen NJ, et al. Effectiveness of an Antimicrobial Stewardship Approach for Urinary Catheter-Associated Asymptomatic Bacteriuria. JAMA Internal Medicine 2015;175:1120-7. Last accessed December 20, 2016.