HRET
HEALTH RESEARCH &
EDUCATIONAL TRUST

2017 UPDATE

PREVENTING CAUTI

>>>

CATHETER-ASSOCIATED URINARY TRACT INFECTIONS (CAUTI)

CHANGE PACKAGE

ACKNOWLEDGMENTS

We would like to recognize the contributions of the Health Research & Educational Trust (HRET) Hospital Improvement Innovation Network (HIIN) team and Cynosure Health for their work in developing the content of this change package.

Suggested Citation: Health Research & Educational Trust (2017). *Catheter-Associated Urinary Tract Infection Change Package: 2017.* Chicago, IL: Health Research & Educational Trust. Accessed at www.hret-hiin.org

Accessible at: http://www.hret-hiin.org/

Contact: hiin@aha.org

TABLE OF CONTENTS

How to Use this Change Package

This change package is intended for hospitals participating in the Hospital Improvement Innovation Network (HIIN) project led by the Centers for Medicare & Medicaid Services (CMS) and Partnership for Patients (PFP); it is meant to be a tool to help you make patient care safer and improve care transitions. This change package is a summary of themes from the successful practices of high performing health organizations across the country. It was developed through clinical practice sharing, organization site visits and subject matter expert contributions. This change package includes a menu of strategies, change concepts and specific actionable items that any hospital can implement based on need or for purposes of improving patient quality of life and care. This change package is intended to be complementary to literature reviews and other evidence-based tools and resources.

PART 1: CATHETER-ASSOCIATED URINARY TRACT INFECTION (CAUTI) DEFINITION AND SCOPE

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 for appropriate indications and should be removed as soon as the patient no longer requires the catheter for such indications.[1]

Magnitude of the Problem

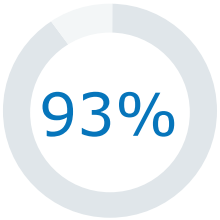
Urinary tract infections are the most common type of health care-associated infection reported to the National Healthcare Safety Network (NHSN), accounting for more than 30 percent of health care-associated infections reported.[2] UTIs also represent the fourth most common type of health care-associated infection overall, with an estimated 93,300 UTIs in acute care hospitals in 2011.[3] Among UTIs acquired in hospital settings, 70-80 percent are associated with an indwelling urinary catheter.[4,5] The CDC estimates that between 15 and 25 percent of hospitalized patients receive urinary catheters during their stay. CAUTI has been associated with increased morbidity, mortality, hospital cost and length of stay. The CDC's most recent annual National and State Healthcare-Associated Infections Progress Report (HAI Progress Report) notes that there was no change in overall CAUTI rates for national acute care hospitals between 2009 and 2014. However, there was progress in non-ICU settings over the same period, progress in all settings between 2013 and 2014 and even more progress in all settings toward the end of 2014.[6]

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)).[7]

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.[9]

> HEN 1.0 Progress

- Through the work of the AHA/HRET Hospital Engagement Network, from 2011 through 2014, over 1,400 hospitals worked to prevent and reduce catheter-associated urinary tract infections. Nine of the 31 states participating reduced CAUTI harm by 40 percent. Under this initiative, 2,805 CAUTIs were prevented, and an estimated $2,805,000 were saved.



of Eligible Acute/CAH/ Children's Hospital Reporting Data

18%

Reduction in Harms for all Tracked Units

WHAT DOES THAT MEANS?

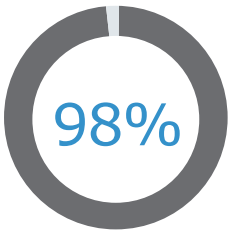
2,805
CAUTI HARMS PREVENTED

$2,805,000
TOTAL PROJECT ESTIMATED COST SAVING

40%
9 states
MEETING THE REDUCTION GOAL

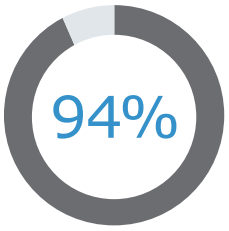
> HEN 2.0 Reduction Progress

- Through the work of the AHA/HRET Hospital Engagement Network 2.0, from September 2015 through September 2016, over 1,500 hospitals worked to prevent and reduce catheter-associated urinary tract infections. Ten of the 34 states participating reduced CAUTI harm by 40 percent. Under this initiative, 505 CAUTIs were prevented, and an estimated $505,000 were saved.



of Eligible Acute/CAH/ Children's Hospital Reporting Data

4%
Reduction in CAUTI Measures



Percent of participants that stated information provided will promote higher quality work

WHAT DOES THAT MEAN?

505
CAUTI HARMS PREVENTED

$505,000
TOTAL PROJECT ESTIMATED COST SAVINGS

10 states
MEETING THE REDUCTION IN PREVENTABLE HARM GOAL
40%

> HIIN Reduction Goals:

- Reduce the rate of catheter-associated urinary tract infections (CAUTI) by 20 percent by September 27, 2018.

PART 2: MEASUREMENT

A key component to making patient care safer in your hospital is to track your progress toward improvement. This section outlines the nationally recognized process and outcome measures that you will be collecting and submitting for the HRET HIIN. Collecting these monthly 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 you need to study your data across time and determine the effect your improvement strategies are having in your hospital at reducing patient harm. Furthermore, collecting these standardized metrics will allow the HRET HIIN to aggregate, analyze and report its progress toward reaching the project's goals across all AEAs by September 27, 2018.

Nationally Recognized Measures: Process and Outcome

> Measures

- Urinary catheter utilization ratio in ICUs and other units and in ICUs (NICU excluded)
- CAUTI rates in ICUs and other units and in ICUs (NICU Excluded)
- CAUTI Standardized Infection Ratio (SIR) in ICUs and other units and in ICUs (NICU Excluded)

PART 3: APPROACHING CAUTI

> Suggested Bundles and Toolkits

- Toolkit for Reducing CAUTI in Hospitals. Agency for Healthcare Research and Quality. Content last reviewed March 2016. Retrieved at http://www.ahrq.gov/professionals/quality-patient-safety/hais/tools/cauti-hospitals/index.html.
- Association for Professionals in Infection Control and Epidemiology: APIC Implementation Guide (2014). Retrieved at www.apic.org/Resource_/EliminationGuideForm/0ff6ae59-0a3a-4640-97b5-eee38b8bed5b/File/CAUTI_06.pdf.
- Catheterout.org Toolkit. Retrieved at http://catheterout.org/drupal/Bladder%20Bundle/?q=the-toolkit.

- Centers for Disease Control and Prevention (CDC) Healthcare Infection Control Practices Advisory Committee (HICPAC) Guideline for Prevention of Catheter-Associated Urinary Tract Infections 2009. Retrieved at www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf.
- The Society for Healthcare Epidemiology of America (SHEA) Compendium for CAUTI – 2014 update. Retrieved at: www.icpsne.org/SHEA%202014%20Updated%20CAUTI%20Prevention%20Guidelines%20(1).pdf
- How-to Guide: *Prevent Catheter-Associated Urinary Tract Infections.* Cambridge, MA: Institute for Healthcare Improvement, 2011. Retrieved at: http://www.ihi.org/resources/pages/tools/howtoguidepreventcatheterassociatedurinarytractinfection.aspx.
- Measuring Hand Hygiene Adherence: Overcoming the Challenges. The Joint Commission, 2009. Retrieved at www.jointcommission.org/assets/1/18/hh_monograph.pdf.
- American Nurses Association Nurse-Driven CAUTI Prevention Tool: http://www.hret-hen.org/resources/anacautiprevention_tool_final_19dec2014.pdf. Accessed December 14, 2016.
- Association for Professionals in Infection Control and Epidemiology (APIC) CAUTI infographic: http://apic.org/Resource_/TinyMceFileManager/Topic-specific/APIC_Infographic_-_ICU_PRINT_FINAL.pdf.
- AHRQ On the CUSP findings:
  - Saint S, Greene MT, Krein SL, et al. A program to prevent catheter-associated urinary tract infection in acute care. NEJM (2016, June); 374:2111-2119. Retrieved at http://www.nejm.org/doi/full/10.1056/NEJMoa1504906#t=article. Last accessed December 14, 2016.

Investigate Your Problem and Implement Best Practices

DRIVER DIAGRAMS: A driver diagram visually demonstrates the causal relationship between your 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 provide you and your care team identify potential change ideas to implement at your facility and 2) to show how this quality improvement tool can be used by your team to tackle new process problems.

AIM	PRIMARY DRIVER	SECONDARY DRIVER	**Change Idea**
		SECONDARY DRIVER	**Change Idea**
	PRIMARY DRIVER	SECONDARY DRIVER	**Change Idea**

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.*

CHANGE IDEAS: *Specific change ideas which will support or achieve the secondary driver.*

Drivers in This Change Package

PREVENT CAUTI	AVOID PLACEMENT OF URINARY CATHETERS	INSERT CATHETERS FOR ONLY APPROPRIATE INDICATIONS	**Change Idea**
		UTILIZE ALTERNATIVES TO INDWELLING CATHETERS	**Change Idea**
	ENSURE RELIABLE ASEPTIC TECHNIQUE	FOCUS ON RELIABLE HAND HYGIENE	**Change Idea**
		MONITOR STRICT ADHERENCE TO ASEPTIC INSERTION TECHNIQUE	**Change Idea**
		FOLLOW PROPER CATHETER MAINTENANCE PROTOCOL	**Change Idea**
	OPTIMIZE PROMPT CATHETER REMOVAL	CONDUCT DAILY REVIEW OF CATHETER NECESSITY	**Change Idea**
		EMPOWER NURSES TO REMOVE CATHETERS WHEN INDICATIONS NO LONGER EXIST	**Change Idea**
	PRACTICE URINE CULTURE STEWARDSHIP	AVOID CULTURING FOR ASYMPTOMATIC BACTERIURIA	**Change Idea**
	PATIENT AND FAMILY ENGAGEMENT	EDUCATE PATIENTS AND FAMILIES REGARDING CATHETER AND GOALS OF EARLY REMOVAL	**Change Idea**

PREVENT CATHETER-ASSOCIATED URINARY TRACT INFECTIONS (CAUTI)

Primary Driver:

AVOID PLACEMENT OF INDWELLING URINARY CATHETERS

Decreasing catheter use, through restricted indications for placement and reducing the length of time a catheter is in place, is the hallmark of successful CAUTI reduction programs.

Secondary Driver > INSERT INDWELLING 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.[10]

Change Ideas

> Engage physican 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.[11]

> Use strategies to engage physicians regarding appropriate indications, particularly in targeted departments (e.g., ED, OR, ICU) and medical and surgical specialties.[12]

> Develop specific placement criteria for ED and OR.

> 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.[13]

Suggested Process Measures for Your Test of Change

- Catheter utilization rate as reported to the CDC NHSN system
- Percentage of patients with a urinary catheter who meet appropriate criteria for placement

Secondary Driver > PROVIDE LEADERSHIP TO SUPPORT ALTERNATIVES TO INDWELLING CATHETERS

Alternatives to indwelling urinary catheters exist for both male and female patients. However, these options are underutilized in most hospitals. A national survey of hospitals reported that external catheters for men were always or almost always used in only 14 percent of hospitals, with a higher percent usage in VA hospitals. Consider these for patients who no longer meet recommended criteria for indwelling catheters, but for whom input and output are being tracked on a less than hourly basis, as well as those who require management of incontinence. Leaders ensure the availability of adequate resources, as well as drive the cultural changes necessary to embrace the use of indwelling catheter alternatives.

Change Ideas

> Stock intermittent/straight catheters, external "condom" catheters, bedside commodes, urinals and continence 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. Use bladder scanner to assess urinary retention and the use of alternatives to indwelling catheters.

> Consider nurse-driven protocols for voiding trials for patients in whom urinary retention is suspected prior to placing indwelling catheter or post removal.

> Educate physicians and nurses on the appropriate use and indications for alternatives.

> Leaders 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 Test of Change

- Catheter utilization rate as reported to the CDC NHSN system
- Percent of patients with urinary catheter who meet criteria

Hardwire the Process

Include reason for urinary catheter in daily unit safety huddles and in ICP surveillance rounds. Assign accountability to charge nurse to discuss urinary catheter utilization daily and report numbers at daily safety briefings. Embed urinary catheter indications in electronic health record ordering systems, with a requirement to note indication before proceeding with catheter insertion.

Primary Driver:

ENSURE RELIABLE ASEPTIC TECHNIQUE

Foundational hand hygiene practice, proper aseptic technique for catheter insertion, and maintenance of a sterile closed loop are essential for CAUTI prevention.

Secondary Driver > 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[15] or the World Health Organization guidelines[16] 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.

> Use the SOAP UP Start-Up tool to engage front-line staff in increasing reliability to hand hygiene.[17]

> 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.

> Leaders address both systems failures and personal accountability, emphasizing hand hygiene as an organizational priority and expected core professional behavior.

> 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.

> Encourage patients and families to ask care providers about hand hygiene when not witnessed.

Suggested Process Measures for Your Test of Change

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

Secondary Driver > ENSURE STRICT ADHERENCE TO ASEPTIC INSERTION TECHNIQUE

Strict adherence to proper aseptic insertion principles includes antiseptic meatal cleansing, use of gloves, and holding the catheter within its plastic sheath at all times.[18]

Change Ideas

> Use aseptic insertion technique and sterile equipment with standard precautions to include 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 Test of Change

- Percentage of nurses with documented catheter insertion competency
- Percentage of patients with the smallest gauge catheter in place

Secondary Driver > FOLLOW PROPER CATHETER MAINTENANCE PROTOCOL

Principles of proper catheter maintenance include good patient hygiene and a closed system with good urine flow through the catheter to the collection bag.[19]

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.

> Ensure good patient hygiene, and consider daily bathing of patients in ICU with chlorhexidine (CHG) or other disinfecting products.[20] Evaluate the evidence and follow organizational risk assessment and infection prevention plan for pH-balanced cleansers or CHG bathing in other units of the hospital.

> Educate all staff and family who care for or transport catheterized patients.

Suggested Process Measures for Your Test 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 secured below level of the bladder during transport (by observation)

Hardwire the Process

Make it easy to do the right thing. Ask staff what their barriers are and make modifications to equipment or processes to improve workflow and optimize catheter maintenance.

Primary Driver:

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.[21] "Forgotten" catheters may remain in place long after indications exist, increasing the risk of CAUTI.

Secondary Driver > CONDUCT DAILY REVIEW OF CATHETER NECESSITY

Change Ideas

> Use reminder interventions (such as visual cues, verbal or written reminders, catheter checklists, etc.) 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.[22]

> Ask a scripted follow up question on rounds to confirm continued use due to indication for "need for accurate measurement of urine output in critically ill patients." For example, prompt nurses to ask physicians, "Please describe how hourly output measurements are being used."

> Incorporate critical uses of hourly urine output into rounding checklists (e.g., need for management of hemodynamic instability requiring hourly titrations 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).[23]

> Coach staff on ways to suggest alternatives when indications no longer exist.

> Collaborate with front-line nurses and physicians to establish methods to collect output data without a urinary catheter (e.g., weighing pads).

Suggested Process Measures for Your Test of Change

- Percentage of patients with indwelling catheters for which indications for continued use were met over total number patients with indwelling catheters in unit on that day (calculated) x 100

Secondary Driver > 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 physician champions (such as infectious disease doctors, hospitalists, surgeons, urologists, etc.), as well as front-line nurses, nursing educators and nursing leaders, to design and support nurse-driven strategies to reduce CAUTI.[25]

> 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).

> Involve clinicians in CAUTI root cause analysis to understand barriers to prompt removal.

> 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.

> Develop nurse and physician CAUTI unit champions.

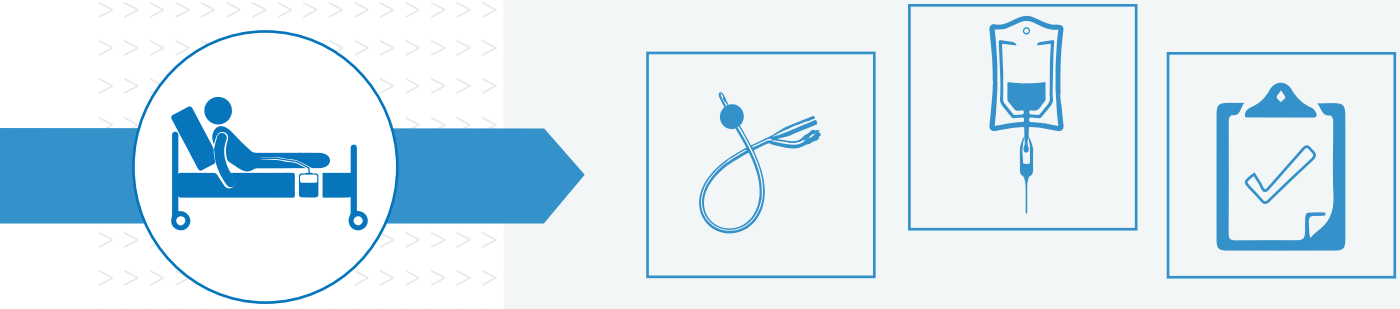
> Post a stop sign on the door exiting the PACU and ICU asking nurses to double check catheter necessity prior to patient transfer to a medical surgical unit.

Suggested Process Measures for Your Test of Change

- Mean number of days of indwelling urinary catheter use per patient
- Percentage of patient days in which a catheter was in place (ratio of catheter days/ patient days) for patients receiving indwelling catheters

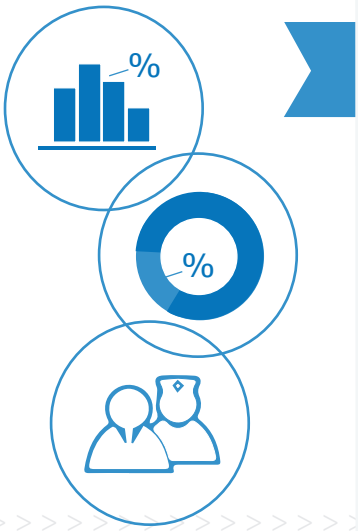
Hardwire the Process

Utilize a self-assessment tool to assess organizational CAUTI prevention strategies, such as the "CAUTI Guide to Patient Safety (CAUTI GPS)" tool developed by Saint, et al.[26] Test nurse-driven protocols and evaluate changes to enhance adherence at local level. Build protocol steps into electronic health records. Utilize evidence-based tools from the Agency for Healthcare Research and Quality CUSP (Comprehensive Unit-based Safety Program) Toolkit.[27]



Primary Driver:

PRACTICE URINE CULTURE STEWARDSHIP



Secondary Driver > AVOID CULTURING FOR ASYMPTOMATIC BACTERIURIA (ASB)

"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 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, including *C. difficile*, in addition to an increase in resistant pathogens that may impact the individual, as well as organization and community patterns of resistance. Lastly, this practice falsely inflates an organization's CAUTI rate as bacteremia is unnecessarily treated.

Change Ideas

> Educate front-line staff about asymptomatic bacteriuria (ASB) and the harm of over-treating ASB.

> Engage physicians in applying the evidence-based guidelines from the Infectious Diseases Society of America (IDSA)[28], particularly addressing challenges in 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.[29,30]

> 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 Test 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)

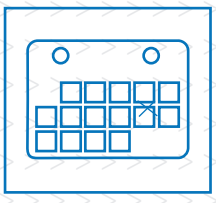
Hardwire the Process

Infection control practitioner (ICP) monitors culturing practices, noting trends, addressing providers and clinicians with patterns of ordering or requesting cultures. Provide transparent data to providers and nursing units.

Primary Driver:

PATIENT AND FAMILY ENGAGEMENT

Involving patients and families in discussions about the risks of indwelling urinary catheters, as well as the benefits of early removal, allows for true shared decision making.



Secondary Driver > EDUCATE PATIENTS AND FAMILIES REGARDING GOALS OF EARLY CATHETER REMOVAL

Educate patients and families about the steps that are being taken to minimize the risk of CAUTI using the teach-back method. Education should include the purpose of the indwelling urinary catheter, the current indications for use, the expected duration of the catheter, why it is important to remove it as soon as possible, as well as catheter alternatives that may be utilized. The greatest opportunity for patient and family engagement in preventing CAUTI comes in the daily review of catheter necessity. When patients and families have knowledge about the risks of CAUTI and participate in the dialogue about whether indications for the catheter still exist, care providers have the opportunity to raise other issues important to patient safety, including progressive mobility and other aspects of care planning.

Change Ideas

> Educate the patient and family about measures they can take to minimize the risk of infection, including the importance of good hand hygiene, personal hygiene and avoiding catheter manipulation.

> For surgical patients having a procedure requiring an intraoperative catheter, include information about the risk for CAUTI and the importance of removing the catheter as quickly as possible as part of preoperative instructions.

> 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 at https://www.cdc.gov/hai/ca_uti/cauti_faqs.html).

Suggested Process Measures for Your Test of Change

- Percent compliance with documentation of patient and family education

Hardwire the Process

Make it easy for staff to provide appropriate education and engage in dialogue with patients and families by preparing patient materials. Include daily review of catheter necessity on bedside change of shift handover forms.

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 indications 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.

Potential Barriers

> 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 that 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.

Enlist administrative leadership as sponsors to help remove or mitigate barriers

> Involve senior leaders in daily interprofessional rounds and root cause analyses to address CAUTIs that do occur.

> Recruit a senior leader as a CAUTI sponsor, and ask for data at the unit level.

> Explore options for stocking alternatives to indwelling catheters in ED and ICU.

> Calculate the monetary impact of CAUTI in your organization and utilize patient stories to emphasize the human impact.

Change not only "The Practice," but also "The Culture"

> The AHRQ CUSP Toolkit contains relevant tools to engage both leaders and front-line staff in changing culture to support improvements in CAUTI prevention.

> Strategies to test to reduce catheter usage include using a staff safety checklist, sample interprofessional rounding forms, and daily safety huddles.

> Changing long-standing care protocols is never easy. Focusing on strong interprofessional teamwork and communication, using team tools like TeamSTEPPS, is useful to empower front-line staff to speak up to prevent harm.

PART 4: CONCLUSION AND ACTION PLANNING

Achieving a 20 percent reduction in catheter-associated urinary tract infections, and the corollary measure of catheter utilization, will require new ways of looking at complex care issues. The inappropriate use of indwelling urinary catheters has the potential to cause not only CAUTIs, but also harm resulting from immobility (such as VTE, falls and pressure ulcers). Understanding CAUTI prevention as a system safety measure 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 I) provides a comprehensive approach to addressing CAUTI prevention.

PART 5: APPENDICES

APPENDIX I: TOP TEN CHECKLIST

Associated Hospital/Organization: HRET HIIN

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

Reference: www.hret-hiin.org

Catheter-Associated Urinary Tract Infections (CAUTI) Top Ten Checklist

- 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 measure.
- 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 kinks, 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 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, 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

Associated Hospital/Organization: CDC, Healthcare Infection Control Practices Advisory Committee

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

Reference: CDC, https://www.cdc.gov/hicpac/cauti/002_cauti_sumorecom.html

Examples 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:
   a. Patients undergoing urologic surgery or other surgery on contiguous structures of the genitourinary tract
   b. Anticipated prolonged duration of surgery (catheters inserted for this reason should be removed in PACU)
   c. Patients anticipated to receive large-volume infusions or diuretics during surgery
   d. 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.

PART 6: REFERENCES

1. Lo E, Nicolle LE, Coffin SE, et al. Strategies to prevent catheter-associated urinary tract infections in acute care hospitals: 2014 update. Infection Control and Hospital Epidemiology 2014;35: S32-S47. Retrieved at: http://www.icpsne.org/SHEA%20 2014%20Updated%20CAUTI%20Prevention%20Guidelines%20(1).pdf. Last accessed December 16, 2016.
2. Centers for Disease Control and Prevention (CDC) website: https://www.cdc.gov/hai/ca_uti/uti.html. Last accessed December 16, 2016.
3. Magill SS, Edwards JR, Bamberg, W, et al. Multistate point-prevalence survey of health care-associated infections, 2011. NEJM; 2014. 370:1198-1208. http://www.nejm.org/doi/pdf/10.1056/NEJMoa1306801. Last accessed December 16, 2016.
4. Saint S, Chenoweth CE. Biofilms and catheter-associated urinary tract infections. Infect Dis Clin North Am. 2003;17;411-432.
5. Weber DJ, Sickbert-Bennett EE, Gould CV, Brown VM, Huslage K, Rutala WA. Incidence of catheter-associated and non-catheter associated urinary tract infections in a healthcare system. Infect Control Hosp Epidemiol 2011; 32:822-823.
6. Centers for Disease Control and Prevention. 2014 National and State Healthcare-Associated Infections Progress Report. Published March, 2016. Available at www.cdc.gov/hai/progress-report/index.html. Accessed December 16, 2016.
7. Saint S, Lipsky BA, Goold SD. Indwelling urinary catheters: a one-point restraint? (Ed.). Ann Int Med 2002:137(2):125-7. Retrieved at http://annals.org/aim/article/715441/indwelling-urinary-catheters-one-point-restraint. Last accessed December 16, 2016.
8. 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. Retrieved at https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/quality-patient-safety/pfp/interimhacrate2013.pdf. Last accessed December 28, 2016.
9. Centers for Disease Control and Prevention. Catheter-associated Urinary Tract Infection (CAUTI) Toolkit (2010). Retrieved at https://www.cdc.gov/HAI/pdfs/toolkits/CAUTItoolkit_3_10.pdf. Last accessed December 28, 2016.
10. 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. Retrieved at https://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf. Last accessed December 16, 2016.
11. Fakih MG, Pena ME, Shemes S, et al. Effect of establishing guidelines on appropriate urinary catheter placement. Acad Emerg Med 2010; 17:337-40. Retrieved at https://www.ncbi.nlm.nih.gov/pubmed/20370769. Last accessed December 20, 2016.
12. Strategies for Physician Engagement. Retrieved at https://catheterout.org/sites/webservices.itcs.umich.edu.drupal.Bladder%20Bundle/files/Strategies%20for%20Physician%20Engagement.pdf. Last accessed December 16, 2016.
13. Agency for Healthcare Research and Quality. Team Strategies & Tools to Enhance Performance & Patient Safety (TeamSTEPPS). Retrieved at http://www.ahrq.gov/teamstepps/index.html. Last accessed December 1, 2016.
14. Saint S, Kowalski CP, Kaufman SR, et. al. Preventing hospital-acquired urinary tract infection in the United States: a national study. Clin Infect Dis 2008:46(2): 243-250. Retrieved at http://cid.oxfordjournals.org/content/46/2/243.long. Last accessed December 19, 2016.
15. 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).
16. WHO Guidelines on Hand Hygiene in Health Care: First Global Patient Safety Challenge, Clean Care is Safer Care (2009). Retrieved at http://www.who.int/gpsc/5may/tools/9789241597906/en/. Last accessed December 20, 2016.
17. Health Research and Educational Trust (HRET) Hospital Innovation and Improvement Network. 2016 UP Campaign Start Up Tool. Retrieved at http://www.hret-hiin.org/topics/up_campaign/resources/hrethiin_upcampaign_startuptool.pdf. Last accessed December 20, 2016.
18. Hooten TM, Bradley SF, Cardenas DD, et al. Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America. Clinical Infectious Diseases 2010; 50:625-63. Retrieved at https://www.idsociety.org/uploadedFiles/IDSA/Guidelines-Patient_Care/PDF_Library/Comp%20UTI.pdf. Last accessed December 19, 2016.

19. Greene L, Felix K, Bellush MJ, Bor B. Guide to Preventing Catheter-Associated Urinary Tract Infections. Washington, DC: Association for Professionals in Infection Control and Epidemiology; 2014. Retrieved at http://apic.org/Resource_/EliminationGuideForm/0ff6ae59-0a3a-4640-97b5-eee38b8bed5b/File/CAUTI_06.pdf. Last accessed December 20, 2016.

20. Frost SA, et. al. Chlorhexidine bathing and health care-associated infections among adult intensive care unit patients: a systematic review and meta-analysis. Critical Care 2016:20:379-384. Retrieved at https://ccforum.biomedcentral.com/articles/10.1186/s13054-016-1553-5. Last accessed December 28, 2016.

21. 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. Retrieved at www.ncbi.nlm.nih.gov/pubmed/24077850. Last accessed December 11, 2016.

22. Saint S, Kaufman SR, Thompson M, Rogers MA, Chenoweth CE. A reminder reduces urinary catheterization in hospitalized patients. Jt Comm J Qual Patient Saf 2005;31(8);455-462. Retrieved at https://www.ncbi.nlm.nih.gov/pubmed/16156193. Last accessed December 16, 2016.

23. 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. Retrieved at www.ncbi.nlm.nih.gov/pubmed/25938928. Last accessed December 19, 2016.

24. 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. Retrieved at https://www.ncbi.nlm.nih.gov/pubmed/22047997. Last accessed December 20, 2016.

25. Catheterout.org Early Removal Toolkit. Retrieved at: http://www.catheterout.org/?q=early-removal. Last accessed December 19, 2016.

26. Saint, S, Gaies E, Fowler KE, Harrod M, Krein SL. Introducing a catheter-associated urinary tract infection (CAUTI) prevention guide to patient safety (GPS). American Journal of Infection Control 2014;42:548-50. Retrieved at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4006283/. Last accessed December 20, 2016.

27. Agency for Healthcare Research and Quality. CUSP Toolkit. Retrieved at https://www.ahrq.gov/professionals/education/curriculum-tools/cusptoolkit/index.html. Last accessed December 28, 2016.

28. Nicolle LE, Bradley S, Colgan R, Rice JC, Schaeffer A, Hooton TM. Infectious Diseases Society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults. Clinical Infectious Diseases 2005;40:643-54. Retrieved at https://www.idsociety.org/uploadedFiles/IDSA/Guidelines-Patient_Care/PDF_Library/Asymptomatic%20Bacteriuria.pdf. Last accessed December 20, 2016.

29. 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. Retrieved at https://www.ncbi.nlm.nih.gov/pubmed/26010222. Last accessed December 20, 2016.

30. Healthcare Infection Control Practices Advisory Committee. Antibiotic Stewardship Statement for Antibiotic Guidelines — The Recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC). 2016. Retrieved at https://www.cdc.gov/hicpac/pdf/Antibiotic-Stewardship-Statement.pdf. Last accessed December 20, 2016.