Mayo Clinic Reduces Catheter-Associated Urinary Tract Infections Through a Bundled 6-C Approach

Innovation in Patient Safety and Quality at the Local Level

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Catheter-associated urinary tract infection (CAUTI) is a frequent complication of health care. CAUTIs are associated with relatively low mortality and morbidity compared to other health care–associated infections (HAIs), but the high prevalence of urinary catheter use leads to a large cumulative burden of infections. A point-prevalence survey conducted in hospitals in the United States in 2011 showed that 24% of hospitalized patients had a urinary catheter in place on the day of the survey. Presence of a urinary catheter is a key contributor to development of urinary tract infections (UTIs). It is estimated that approximately 93,000 patients develop a hospital-acquired UTI for 2011, most of which are associated with a urinary catheter. Approximately 13,000 deaths were attributed to UTIs in

Article-at-a-Glance

Background: Catheter-associated urinary tract infections (CAUTIs) are associated with relatively low mortality and morbidity compared to other health care–associated infections (HAIs), but the high prevalence of urinary catheter use leads to a large cumulative burden of infections. Mayo Clinic (Rochester, Minnesota), a large academic center, had high CAUTI rates despite having optimized aseptic placement of catheters and reduction of urinary catheter utilization.

Methods: Rigorous quality improvement methods were used to identify a bundle of interventions to reduce CAUTI. This bundle—which consisted of six easy-to-remember elements, the “6 Cs” of CAUTI reduction (for example, “Culture urine only when indication is clear”)—was piloted on one ICU with excellent results and subsequently diffused throughout the health care facility using a multimedia approach. Feedback on compliance with elements of the bundle and on CAUTI rates was provided to leaders of patient care units.

Results: This approach resulted in elimination of CAUTI on the pilot unit, which has been sustained for an entire year. Hospitalwide, CAUTI rates decreased by 70% from the 2013 baseline of 2.0/1,000 catheter-days to 0.6/1,000 catheter-days in 2015.

Discussion: The urinary catheter maintenance bundle was implemented after urinary catheter usage had been reduced to optimum levels for the patient population. The addition of this bundle reduced CAUTI by 70%. Some of this reduction was related to a definition change implemented in January 2015, which eliminated urine cultures with Candida from the CAUTI definition, but the decreases in CAUTI rates began before this definition change, and the definition change does not account for the entire reduction.
2002. CAUTI places a significant burden on the health care system through increased hospital length of stay and hospital costs. Data from the Centers for Disease Control and Prevention indicate that nationally there was no change in CAUTI rates between 2009 and 2014, in contrast to the decrease noted in other HAIs during this time frame.

In addition to infections, catheters can result in patient harm in other ways. The urinary catheter drainage system becomes colonized with microorganisms, and catheterized urine serves as a major reservoir for transmission of antibiotic-resistant organisms in health care facilities.

Urinary catheters are also associated with noninfectious complications such as urinary tract strictures, reduced patient mobility, and falls.

Guidelines regarding CAUTI prevention were first published in 1981 and updated in 2009 and 2014. These guidelines provide recommendations for catheter use, catheter insertion, catheter care, and implementation of programs to prevent CAUTI. During the last few years, several institutions have reported successful CAUTI reductions through prevention programs that have varied in components and implementation approaches. For example, a statewide program in Michigan reduced urinary catheter use from 18.1% to 13.8%. A survey-based study that compared a random sample of hospitals in the United States to all Michigan hospitals reported that the latter more frequently participated in HAI reduction collaboratives, with participation coinciding with a 25% reduction of CAUTI rates in the state.

A bundle of four interventions—use of silver-coated urinary catheters, use of a securement device, repositioning if catheter tubing touched the floor, and early removal of catheters in surgical patients—was reported as effective in reducing CAUTI in a community hospital in the United States. A bundle of interventions that focused on aseptic catheter insertion, insertion of catheters for appropriate indications, catheter care, and early removal of catheters reduced CAUTIs by 47% in 13 adult ICUs in Turkey. Similar CAUTI reduction has been reported in pediatric ICUs through a combination of appropriate catheter placement, maintenance, and early removal. Decreasing catheter use through restricted indications for placement or duration of catheterization have been major components for most bundles.

In this article we describe a quality improvement (QI) project at a large academic medical center that successfully reduced CAUTI. Our approach was similar to the approaches used in the cited studies in that we used a number of interventions implemented together as a bundle. Our intervention focused on a combination of reducing unnecessary catheter use and appropriate maintenance of urinary catheters.

### Methods

#### Setting

Mayo Clinic–Rochester is a large academic medical center with 1,300 hospital beds that includes 213 ICU beds, approximately 325,000 total patient-days, and 50,000 ICU patient-days annually.

#### Targeting CAUTI Reduction

An indwelling urinary catheter is a flexible drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and is connected to a closed collection system. The presence of an indwelling catheter is a major risk factor for UTI; UTIs occurring in the presence of an indwelling catheter are called catheter-associated UTIs or CAUTIs. The catheter allows microbial pathogens to enter the urinary tract either by the extraluminal route, via migration along the outside of the catheter in the periurethral mucous sheath, or by the intraluminal route, via movement along the internal lumen of the catheter from a contaminated collection bag or catheter-drainage tube junction. To enable comparison of CAUTI rates between institutions, the National Healthcare Safety Network (NHSN), has published a standard CAUTI definition. This definition has been criticized for its lack of correlation with clinical practice and the fact that the rate is heavily influenced by the prevalence of fever and frequency of urine culturing. Nevertheless, since 2012, hospitals have been required to report CAUTIs in the ICU and rehabilitation units identified by the NHSN definition to the Centers for Medicare & Medicaid Services. Since January 2015, CAUTIs in medical and surgical units have also been required to be reported. These data are used in decisions about the quality of health care and the payments to the institution through the national pay-for-performance programs. Finally, CAUTI rates are made public on the Hospital Compare website, and high CAUTI rates can negatively affect institutional reputations. For these reasons, as well as the represented harm to patients, most hospitals are actively trying to reduce CAUTIs.

A key element in CAUTI prevention is aseptic technique during catheter placement. Mayo Clinic has a long tradition of teams that perform specific tasks and established the first catheter team in 1907. The catheter team, which has evolved over the years, currently consists of trained urology technicians, whose sole responsibility is placing and caring for urinary catheters. Every urinary catheter in the hospital and emergency room setting is placed by a member of this team. The urology technicians receive specialized education on catheter insertion and catheter care. Their competency in catheter insertion is assessed at least annually. The team is led by a certified urology RN.
Another CAUTI prevention strategy is reduction of unnecessary urinary catheter use. A previous QI project at Mayo Clinic reduced urinary catheter utilization in both ICU and general patient care settings by ensuring that catheters were placed only when appropriate and that they were promptly removed when no longer necessary, as per published guidelines. Providers ordering urinary catheter placement were presented in the electronic health record (EHR) with a list of appropriate indications on the ordering screen and had to select at least one indication; this information is also provided as a pocket card (Sidebar 1, above). Prompts were created that required staff to assess and document each day whether the catheter was still necessary and reminded them to remove urinary catheters that were no longer necessary. Through these measures, the device utilization ratio for urinary catheters (catheter-days/patient-days) was reduced by 28% to 0.51 in the ICUs and 0.13 in the non-ICUs—lower than the national reported rates of 0.60 for ICUs and 0.17 for non-ICU wards in 2013.

Despite these efforts, in 2013 we had a hospitalwide CAUTI rate of 2.0/1,000 catheter-days and an ICU rate of 2.8/1,000 catheter-days. The reduction in catheter utilization may have had the undesirable effect of increasing CAUTI rates by reducing the denominator (catheter-days), without affecting the numerator (CAUTI events). In May 2014 a multidisciplinary team was formed to address CAUTIs. The team consisted of members of the Infection Prevention and Control Department [P.S., J.W., R.T.], a hospitalist [T.B.], a patient care nurse [N.M], urology technician supervisors [Maureen Johnson, H.T.], nurse educators [W.W., J.L.], nurse managers and supervisors [Maren Johnson, D.K.], QI, a health care systems engineer [S.D.], and administrators. The published CAUTI guidelines were reviewed, and all CAUTI reduction interventions were identified. The team then identified the gaps between the best practices identified in the guideline and our clinical practice. The team met twice a month from May 2014 through May 2015 and then monthly through the end of 2015.

### Designing and Implementing the Interventions

**Pilot in a Medical ICU.** The team further investigated the reasons for the gaps using the following methods:
- Surveys of frontline nursing staff
- Process maps
- Interviews with staff from the positive outliers (units with very low CAUTI rates) to learn from CAUTI prevention practices on their units

Interventions were designed to remedy these gaps and were piloted between August 2014 and January 2015 in the 24-bed medical ICU, which had the highest CAUTI rates. Plan-Do-Study-Act cycles were used to identify successful strategies. Two dedicated data collectors performed pre- and post-pilot implementation data collection. Most processes measured during the pilot showed improvement (Figure 1, page 257), and there was a corresponding decrease in CAUTI rates on this unit (Figure 2, page 257).

**Creation of the CAUTI Bundle.** All the learnings from this pilot were distilled down to a CAUTI bundle consisting of six easy-to-remember elements, which we called the “6 Cs” of CAUTI reduction.
- **Consider** alternatives. Staff were encouraged to look to alternatives to an indwelling Foley catheter each day (for example, intermittent catheterization, condom catheters in men, male and female urinals).
- **Connect** with a securement device. All indwelling catheters should be secured to minimize movement and urethral irritation. Securement devices that were most appropriate for our institution were identified and stocked on the units. Details on how to select a securement device were provided to staff.
- **Keep it Clean.** This reminds staff to perform appropriate perineal care and catheter care. We had implemented chlorhexidine bathing of all ICU patients as one of the strategies to reduce central line–associated bloodstream infections (CLABSI). Because liquid chlorhexidine cannot be used on mucosal surfaces, we found that perineal care during bathing was sometimes omitted in ICU patients. We reeducated nurses and patient care
assistants about the importance of perineal care and promoted perineal care with soap and water or using disposable incontinence wipes. Some units elected to create “bath kits” that included all the supplies needed for perineal/catheter care with bathing.

- Keep it Closed. Breaking the closed sterile drainage system introduces contamination. Nursing staff were reminded that the urinary catheter system should be accessed only when medically necessary and that aseptic technique should be used when accessing the system. Routine catheter changes and the practice of changing catheters for the sole purpose of reinserting a catheter with a temperature probe were discouraged.

- Call for bladder scan before irrigating. An analysis of reasons for ordering bladder irrigation revealed that providers most commonly ordered irrigations when patients had low urine output, in an effort to rule out catheter occlusion as a cause for reduced urine output. In many instances, the low urine output was due to hypovolemia and not due to bladder obstruction. Our team recommended that in the absence of gross hematuria (visible blood in the urinary catheter) a bladder scan should be performed to document presence of urine in the bladder prior to irrigation. Urology technicians performed the bladder scans and recommended against irrigation if no urine was present in the bladder. In addition, when appropriate, bladder irrigation was performed only by the trained urology technicians. Physicians, nurses, and urology staff were educated on this bundle element.

- Culture urine only when indication is clear. Urinary catheters are frequently colonized with bacteria and yeast. Fever is

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**Figure 1.** Most of the processes measured during the pilot study showed improvement.

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**Figure 2.** Decreases in the CAUTI rate were observed after the CAUTI project onset (May 2014). The team began implementing bundle items in August 2014, with formal education to reinforce bundle use starting in March 2015.
also very common in ICUs, and urine cultures are commonly ordered whenever patients have a fever. This results in the classification of all patients who have a positive urine culture and a fever as having a CAUTI per the NHSN definition. The team came to consensus on appropriate indications for obtaining a urine culture, obtained buy-in from physician leaders, and then created education in the form of a PowerPoint presentation and newsletter items that were distributed to all physicians. Yet it became apparent over the next three months that this had minimal impact on urine culture ordering. We then made changes to the process for ordering urine cultures in the electronic order entry system. The indications were presented to physicians on the urine culture ordering screens in the EHR. The appropriate indications were reiterated in nursing education so that nurses could advocate for appropriate culturing. Cards with the approved indications were printed and available on all the units. The nursing staff handed the cards to trainees (residents and fellows) when inappropriate cultures were ordered. It was emphasized to nursing staff that when a specimen was obtained for urine culture, it needed to be sent to the microbiology laboratory as soon as possible to prevent overgrowth of organisms in the specimen and false-positive culture results.

Three changes to the EHR were implemented to support compliance with the bundle, as follows:
1. Documentation of catheter/perineal care was standardized. This meant that these data could be retrieved from the EHR and feedback on compliance provided to nursing units.
2. A protocol to facilitate ordering of bladder scans by nurses was created. This was aimed at minimizing unnecessary irrigations in patients with low urine output.
3. Changes to the process of ordering urine cultures were made. These made it mandatory for providers to select from a list of appropriate indications, which resulted in a 50% decrease in urine cultures.

**Diffusion of the CAUTI Bundle Throughout the Hospital.** In May 2015 the bundle was rolled out to the remaining 8 adult and pediatric ICUs and to the 38 general care units. To promote its adoption, a multimedia campaign was created utilizing print, video, and online learning. The campaign’s style and color scheme were repeated throughout each educational component to reinforce the education. The CAUTI bundle was described in colorful posters, as shown in Appendix 1 (available in online article). Each bundle element was summarized on pocket cards that were made available on every patient care unit (Sidebar 2, page 259; also Appendix 2, available in online article). A tip sheet with rationale for each of the bundle elements was created. A short (eight-minute) video was created by the medical ICU staff starring a canine CAUTI champion called “Uti” to provide education on the bundle elements. The premise of the video was that Uti could detect deviation from best practices as outlined in the CAUTI bundle and offer ways to correct the defect. Mandatory education of all ICU physicians and all trainees (residents and fellows) was accomplished through a PowerPoint presentation. The hospital epidemiologists provided additional in-person CAUTI education at staff meetings and addressed questions from providers. A toolkit that collated all these resources was created and posted on the Infection Prevention and Control (IPAC) website. Audit tools were also made available within the toolkit for patient care units to perform baseline assessment and measure subsequent progress toward adoption of the CAUTI bundle.

**Results**
CAUTI rates decreased by 70% from the 2013 baseline of 2.0/1,000 catheter-days to 0.6/1,000 catheter-days in 2015 (Figure 3, page 259). NHSN uses an alternative metric to measure CAUTI called the standardized infection ratio (SIR), which is the ratio of actual cases identified compared to what would be expected for that setting. The SIR for CAUTIs in the ICU was reduced from about 1.0 in 2013 and 2014 to 0.24 in 2015.

Starting in January 2015, the NHSN surveillance definition changed, with the two key changes as follows:
1. Elimination of urine cultures with *Candida* and cultures that showed growth of < 100,000 organisms from the definition
2. Widening the window during which fever would count towards classification of a positive urine culture as CAUTI

In an analysis of CAUTI cases in 2014 and 2015, application of the new NHSN definition to cases in both years still showed a reduction of 30% between 2014 and 2015 that was not accounted for by definition change. Also, the CAUTI rate on the pilot unit that contributed 25% of ICU CAUTIs and 16% of housewide cases in 2013 began decreasing in 2014 before the definition change and remained at zero throughout 2015.

**Discussion**
We describe a CAUTI bundle that successfully reduced CAUTI at our institution. Bundles are series of interventions that, when implemented together, are intended to achieve significantly better outcomes than when implemented individually. Bundles have been successful in reducing HAIs with ICU CLABSIIs, with consistent and sustained reductions during the last several years since the introduction of the CLABSI bundle. Several CAUTI bundles have been reported as being effective at CAUTI reduction. Saint et al. proposed a five-compo-
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**Sidebar 2. Pocket Cards Reinforcing Each Bundle Element**

**CONSIDER alternatives**
Avoid indwelling (Foley) catheters when possible.
- Alternatives; voiding trial, bladder scan, I&O [in and out]
- Catheterization, urinary bedpan, and condom catheter
Remove the catheter when no longer medically necessary.
Perform a daily catheter need assessment to determine if the catheter can be removed or an alternative used.

**CONNECT with a securement device**
Secure EVERY urinary catheter.
Securing prevents inadvertent pulling of the catheter that can irritate the urinary tract and introduce bacteria.
STATLOCK® is the recommended option for Foley catheters.
If using a STATLOCK®:
- Prepare the site with alcohol and skin protectant pads before applying.
- To remove, saturate anchor pad with alcohol and gently peel away.

**Keep it CLEAN**
Use incontinence cleanup cloths or soap and water to clean the perineum, urethral meatus, and urinary catheter.
Perform peri-care and catheter care with daily bath and after fecal incontinence.
Always clean the perineum front to back.
Document the cleaning.
Do not use chlorhexidine for peri-care and catheter care.

**Keep it CLOSED**
Breaking the closed urinary system increases the risk for contamination; do so only when medically necessary.
Do hand hygiene, use clean gloves and aseptic technique when exchanging a drainage bag for another container.
Clean the tapered end of the collection container tubing and the catheter with alcohol prior to connecting.

**CALL for bladder scan before irrigating**
Irrigation increases CAUTI [catheter-associated urinary tract infection] risk as it compromises the sterility of the closed system.
Accurate assessment of bladder urine volume eliminates unnecessary irrigations.
If bladder scan shows no urine in the bladder, irrigations are not appropriate.
If irrigation is appropriate, it should be performed only by Urology Technicians.

**CULTURE urine only when indication is clear**
Providers must choose an appropriate indication when ordering a urine culture.
Smelly, cloudy urine or pyuria are not reliable indicators of UTI [urinary tract infection] and are not reasons to culture.
Scrub the sampling port with an alcohol wipe before obtaining a specimen.
Do NOT obtain samples and hold for an order. Cultures can be falsely positive if specimen does not get to the lab within 1 hour. Refrigerate or collect new sample if order delayed.

* The icons associated with each bundle element, as shown in Appendix 2 (available in online article), were also provided in the pocket cards.

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![Graph showing decrease in CAUTI rates](image)

**Figure 3. CAUTI rates decreased by 70% from the 2013 baseline of 2.0/1,000 catheter-days to 0.6/1,000 catheter-days in 2015.**

ement Keystone Bladder bundle, in which four of the five bundle elements addressed reduction of urinary catheter utilization, and the fifth element dealt broadly with “insertion, care, and maintenance.” When we began work on our CAUTI reduction project in 2014, we felt that we had optimized both aseptic catheter insertion and catheter utilization and did not have much room for improvement in these two areas. Care and maintenance of the catheters was where we identified numerous opportunities for improvement. We tested interventions to improve catheter care and measured compliance with these interventions in the 24-bed medical ICU. As compliance with the interventions improved, we saw a corresponding decrease in CAUTI rates. The bundle was then promoted using a variety of tools. Since adoption of the bundle, we have seen a reduction in CAUTI that has been sustained over several months.

**Barriers**
Changes to the EHR to support bundle implementation required many layers of approvals and were often delayed due to competing institutional priorities. Implementation of an ordering screen that required providers to select from a list of appropriate indications when ordering a urine culture was successful at reducing unnecessary urine cultures—but this success was short lived as residents found ways to bypass the screen. Additional changes to the EHR were needed to eliminate the residents' workarounds. Nursing staff and physicians had misconceptions that bladder spasms were a legitimate reason to...
irrigate urinary catheters. They needed to be persuaded that irrigation could actually worsen bladder spasms. As we are a teaching organization, we have new residents and fellows each year. To maintain the initial gains of the CAUTI reduction project, we have made CAUTI reduction education part of the required education for all new residents and fellows.

**Ongoing Challenges**

The CAUTI definition has changed significantly, making comparisons of rates over time challenging. The elimination of *Candida* from the definition of CAUTI in 2015 accounted for some of our demonstrated CAUTI reduction.\(^ {22}\) However, when we retrospectively eliminated *Candida* in the CAUTIs we identified in 2014, we still had significant reduction in CAUTIs between 2014 and 2015.

CAUTI is traditionally thought of as a low-consequence infection and therefore not something institutions want to invest time and effort in. The fact that CAUTI rates are now publicly reported via Hospital Compare, and CAUTI is part of pay-for-performance programs such as Value-Based Purchasing (VBP) and the Hospital-Acquired Conditions (HAC) program has helped to garner institutional support for CAUTI reduction.\(^ {26-28}\) In addition to the financial implications, CAUTI has patient safety implications beyond the infection itself. Urinary catheters serve as reservoirs of multidrug-resistant organisms.\(^ {29-31}\) Treatment of positive urine cultures accounts for a significant proportion of unnecessary antimicrobial use in the health care setting that in turn can promote emergence in antimicrobial resistance and increase in rates of *Clostridium difficile* infection.\(^ {15,32}\) Finally, urinary catheters have been described as “one-point restraints” that impair patient mobility and may contribute to falls or other adverse events.\(^ {28}\) For these reasons, alternatives to catheterization, one of the elements of our bundle, need to be an area of focus.

**Advice for Other Health Care Organizations**

We have found that placement of catheters by urology technicians is a cost-effective strategy at our institution. The catheter team consists of 48 individuals, ensuring 24/7 coverage for our hospitals. This may not be feasible at smaller institutions. However, the approach of training staff that place urinary catheters and periodic reassessment of competency could be easily adopted by other institutions. We found that educating staff on the bundle elements was only modestly effective in changing behavior. Electronic prompts that reinforced the bundle elements (presenting the appropriate indications for catheter irrigation, ordering urine cultures) were more successful in sustaining behavioral changes.

One of the key elements of our success was engagement of frontline staff. The ICU nurses and members of the catheter team (urology technicians) were very involved in identifying interventions to test, measuring the effect of the interventions, and devising the final CAUTI bundle. They remained engaged throughout the project and have been the main drivers of CAUTI bundle implementation.

**Summary**

The primary CAUTI reduction strategies of ensuring aseptic technique during catheter placement and reducing urinary catheter utilization were already in place at our institution. A multidisciplinary team approach, which entailed the use of QI methodology and engagement of frontline staff, resulted in the identification of additional strategies to reduce CAUTI. By implementing these strategies, we successfully reduced CAUTIs and have sustained this reduction through March 2016. The tools created during this project can be easily adapted for use at other institutions.\(^ {\dagger}\)

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**Online Only Content**

[http://www.ingentaconnect.com/content/jcaho/jcjqs](http://www.ingentaconnect.com/content/jcaho/jcjqs)

See the online version of this article for Appendix 1. Prevent CAUTI Poster. © 2015 Mayo Foundation for Medical Education and Research

Appendix 2. Pocket Cards Reinforcing Each Bundle Element
References

Appendix 1. Prevent CAUTI Poster. © 2015 Mayo Foundation for Medical Education and Research

CONSIDER alternatives
CONNECT with a securement device
Keep it CLEAN
Keep it CLOSED
CALL for bladder scan before irrigating
CULTURE urine only when indication is clear

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Appendix 2. Pocket Cards Reinforcing Each Bundle Element

CONSIDER alternatives

Avoid indwelling (Foley) catheters when possible.
- Alternatives: voiding trial, bladder scan, I&O catheterization, urinal, bedpan, and condom catheter

Remove the catheter when no longer medically necessary.

Perform a daily catheter need assessment to determine if the catheter can be removed or an alternative used.

CONNECT with a securement device

Secure EVERY urinary catheter.

Securing prevents inadvertent pulling of the catheter that can irritate the urinary tract and introduce bacteria.

STATLOCK® is the recommended option for Foley catheters.

If using a STATLOCK®:
- Prepare the site with alcohol and skin protectant pads before applying
- To remove, saturate anchor pad with alcohol and gently peel away

(continued on page AP3)
**Appendix 2. Pocket Cards Reinforcing Each Bundle Element (continued)**

**Keep it CLEAN**

Use incontinence clean up cloths or soap and water to clean the perineum, urethral meatus and urinary catheter.

Perform peri-care and catheter care with daily bath and after fecal incontinence.

Always clean the perineum front to back.

Document the cleaning.

Do not use chlorhexidine for peri-care and catheter care.

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**Keep it CLOSED**

Breaking the closed urinary system increases the risk for contamination; do so only when medically necessary.

Do hand hygiene, use clean gloves and aseptic technique when exchanging a drainage bag for another container.

Clean the tapered end of the collection container tubing and the catheter with alcohol prior to connecting.

(continued on page AP4)
Appendix 2. Pocket Cards Reinforcing Each Bundle Element (continued)

**CALL** for bladder scans before irrigating

Irrigation increases CAUTI risk as it compromises the sterility of the closed system.

Accurate assessment of bladder urine volume eliminates unnecessary irrigations.

If bladder scan shows no urine in the bladder, irrigations are not appropriate.

If irrigation is appropriate, it should be performed only by Urology Technicians.

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**CULTURE** urine only when indication is clear

Providers must choose an appropriate indication when ordering a urine culture.

Smelly, cloudy urine or pyuria are not reliable indicators of UTI and are not reasons to culture.

Scrub the sampling port with an alcohol wipe before obtaining a specimen.

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