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Indwelling Urinary Catheter Management of the Acute Patient

Quality Improvement Issue Brief

Indwelling Urinary Catheter Management of the Acute Patient

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BACKGROUND

The American Urological Association (AUA) published the white paper, *Catheter-Associated Urinary Tract Infections: Definitions and Significance in the Urologic Patient*, in 2014. At that time, the panel found it challenging to apply broad catheter-associated urinary tract infection (CAUTI) definitions to specific urologic clinical presentations. The paper addressed limitations surrounding how and when current definitions could be used to detect a CAUTI in a urologic patient, proposed alternative methods for CAUTI diagnosis in specific populations, described techniques how CAUTI might be avoided through proper urethral catheterization, and identified alternatives to indwelling urinary catheters (IUC) for urologic patients.

Since that time, the definition of CAUTI has changed, a number of societies have released new guidelines related to CAUTI, and the ways in which clinicians prevent and treat a CAUTI has evolved. Because of the emphasis on the Centers for Medicare and Medicaid Services (CMS) Hospital-Acquired Condition (HAC) Reduction Program, many institutions have enacted new protocols for catheter management, such as nurse-driven protocols for urinary catheter removal.¹ Given the shift in practice, this Quality Improvement Issue Brief (QIIB) aims to provide clinicians with guidance on how to optimize care for hospitalized patients with IUCs to help prevent complications.

QUALITY PROBLEM

The use of IUCs for hospitalized patients is well established for the acute management of fluid intake and urinary output, urinary retention, and postoperative management following genitourinary surgery. One in four adult hospital inpatients will have an IUC at some time during their hospitalization.² As with any type of invasive procedure or device, IUCs pose significant risks and burden for the patient and the healthcare system. Therefore, many medical societies currently recommend that these catheters should be used only for specific indications and removed as soon as they are no longer necessary.

In general, a urinary tract infection (UTI) is defined as an infection involving any part of the urinary system including the urethra, bladder, ureters and kidneys. These may be classified as complicated and uncomplicated, with complicated UTIs arising in patients with altered anatomy, urinary tract obstruction, urinary retention, immunocompromised individuals, pregnant women, men, and those with an indwelling foreign body such as a urinary catheter. Up to 75-80% of complicated UTIs are attributed to an IUC and are referred to as a CAUTI.^{3,4} Some patients are at greater risk of developing CAUTIs (Table 1).

While most often asymptomatic, the incidence of bacteriuria in hospitalized patients with an IUC is 3-7% daily.⁵

⁶ This bacteriuria leads to bacteremia and sepsis in 5% of cases and therefore represents a significant problem for the patient and health care system.⁷ Some cases of bacteriuria may lead to infection in these catheterized patients resulting in a CAUTI. Symptoms must be present to meet the definition of an actual infection requiring treatment. Symptoms include fever, suprapubic tenderness, costovertebral angle pain or tenderness, urinary urgency, urinary frequency, and dysuria.⁵

CAUTIs lead to unnecessary burden for care of patients in the United States healthcare system. These may lead to increased length of stay, higher cost of care, and potential antibiotic misuse and resistance.^{8,9} Additional costs for the care of these patients can range from \$1,300-1,600 per patient and an increase in the hospital length of stay by up to 2-4 days, thus leading to added patient discomfort and decreased patient satisfaction.⁷ Overall, CAUTIs can also increase the risk of death, which are estimated to account for more than 13,000 per year.⁷

It is possible that 50-70% of CAUTIs can be prevented.² Because of this, CMS initiated the HAC Reduction Program. In this program, each hospital may have payments impacted if it has disproportionately high rates of various HACs, which include central line-associated bloodstream infection, surgical site infection for hysterectomy, methicillin-resistant Staph aureus bacteremia, Clostridium difficile infection, and CAUTIs. In this program, CMS evaluates the hospital's overall performance using calculated HAC scores for each infection listed above. These scores are calculated by CMS and then weighted individually in order to create a total HAC score. Facilities with a total HAC score within the worst performing quartile are subject to a 1% payment reduction by CMS. This lends a significant financial burden upon each facility in addition to the added cost of the CAUTIs.¹⁰

Finally, CAUTIs are the most common types of healthcare-associated infections (HAI) reported to the National Healthcare Safety Network (NHSN), making up 9% of all of the HAIs followed by CMS¹¹ and accounting for over 560,000 infections per year.⁷ Therefore, attention to this issue with guidance on acute IUC management is imperative for urologic patients and the urologic specialty.

Table 1. Risks for development of CAUTI^{3, 12}

Longer duration of indwelling urinary catheter
Advanced age
Female gender
Diabetes

ADDRESSING CAUTI FOR TODAY'S UROLOGISTS

Many institutions have implemented initiatives to help prevent CAUTI. For example, some practices have implemented protocols providing guidance on when IUCs may be placed, educated practitioners on appropriate catheter care, and constructed electronic health record (EHR) reminders and automatic stop orders for catheter discontinuation. In addition, many institutions have transitioned to nurse-driven protocols for catheter discontinuation and removal, while still acknowledging the need for nurses and providers to discuss individual patient circumstances. Urologists and urology nurses may be identified as champions to help promote and implement these nurse-driven protocols.² The intent of this QIIB is to help clinicians and surgeons recognize key considerations for care of the patient in the acute care setting with an IUC prior to removal, to help prevent complications. Table 2 outlines items to consider prior to removing an IUC. These considerations are essential to ensure a successful removal process for the patient and to minimize the likelihood of needing to place another IUC.

Table 2. Catheter Removal Considerations

When removing a urinary catheter, clinicians should consider the following:

Considerations	Discussion
<i>Does the patient have a prior history of any significant voiding issues (incomplete bladder emptying, incontinence, straining, or overactive bladder) or urinary retention?</i>	Patients with a previous history of voiding issues have an increased risk of post-operative urinary retention. ¹³ The use of alpha blockers in these patients may help to prevent urinary retention following urologic surgery. ¹⁴
<i>Have alpha blockers been administered or restarted prior to voiding trial?</i>	<p>Patients with incomplete bladder emptying or a history of benign prostatic hyperplasia (BPH) may benefit from receiving an alpha blocker prior to IUC removal. Female patients requiring a catheter may also benefit from an alpha blocker. The alpha blocker should ideally be administered the night before an IUC is removed.</p> <p>If an alpha blocker prescribed prior to the surgery was held, it should be restarted prior to IUC removal, if clinically appropriate.</p> <p>The choice of alpha blocker should be based on patient age and comorbidities, and different adverse event profiles.¹⁵</p>
<i>Is the patient taking certain medications that may impact the success of removing the catheter? Is it appropriate to hold, limit, or delay the medications that may negatively impact success?</i>	<p>Anticholinergics: anticholinergic agents may increase the risk of urinary retention in some patients¹⁶</p> <p>Benzodiazepines: benzodiazepines may increase the risk of urinary retention in some patients¹⁷</p> <p>Beta-3 Agonists: Beta-3 agonists may increase the risk of urinary retention in some patients¹⁷</p> <p>Anticoagulants: anticoagulant agents may increase bleeding risk in some patients¹⁸</p> <p>Opioids: systemic opioids may increase the risk of urinary retention in some patients¹³</p> <p>Sedatives: sedatives may increase the risk of urinary retention in some patients</p>
<i>Was an active or passive voiding trial conducted?</i>	<p>Active voiding trials entail filling the bladder with sterile water or saline before catheter removal and immediately assessing whether the patient can void effectively. Passive voiding trials involve removing the catheter, allowing the bladder to fill with urine naturally, and monitoring voiding.¹⁹</p> <p>Active voiding trials may be appropriate for patients requiring immediate confirmation of a successful voiding trial and patients at risk secondary to the above factors.</p>
<i>Can the patient ambulate to the bathroom? Do they have an ability to use a urinal? Do they have a urinal? Do they need cues for voiding reminders (i.e., prompting, alarms, nursing checks)? Is the patient constipated?</i>	<p>It is imperative to determine toileting habits prior to hospitalization. Assess for history (prior to hospitalization) of urinary incontinence and other lower urinary tract symptoms (LUTS) (i.e., urgency, frequency, nocturia, symptoms of incomplete bladder emptying, straining).</p> <p>Assess if the patient is constipated. Constipation can contribute to urinary retention.</p>
<i>Was it difficult to catheterize the patient initially?</i>	If the catheter was placed by a urologist for a difficult IUC placement, the patient had a recent surgery on the urinary tract, or

	the patient has a prior history of traumatic catheterization, the care team should be prepared to replace the catheter if the patient fails the voiding trial. Equipment and expertise to place a difficult IUC should be available, and the care team should consult the urologic team prior to catheter removal.
<i>Is the patient at risk of bleeding with removal and possible clot retention?</i>	Anticoagulants can contribute to hematuria and possible clot retention in those with IUCs.
<i>Does the patient have any neurological conditions/disorders? Did the patient have back or neurosurgery?</i>	Stroke, back surgery, laminectomy, as well as other conditions and surgeries puts the patient at an increased risk for an unsuccessful catheter removal or higher risk for retention/incomplete bladder emptying.
<i>Is the catheter being removed at the appropriate time of day?</i>	If a passive voiding trial is planned, remove the IUC at midnight or early in the morning. If an active voiding trial is planned, remove the IUC early in the morning.
<i>Were fluids encouraged?</i>	The patient should be provided liberal access to oral fluids.

DISCUSSION

IUCs should be placed only when they are clinically indicated and should be discontinued as soon as possible and when deemed appropriate by the treating clinician or surgeon.²⁰ Specific urological situations and patient populations may require longer-term catheterization (Table 3). Prior to removal, the primary team should assess the patient to determine if there is a need for persistent IUC usage, beyond standard catheter removal policies.

Table 3. Conditions and Surgeries Requiring Urologic Consultation Before Removing Urinary Catheter

The following recommendations regarding length of time with indwelling catheter are generalized recommendations. Management for each individual may vary depending on clinical judgement.

Condition	Potential Risks Associated with Early Catheter Removal	Common Length of Time Indwelling Catheter is Used
Bladder		
Bladder Injury/Perforation	Peritonitis, urinoma, abscess, trauma	7 – 21 days from injury Check with surgical team prior to removal
Bladder Surgery <ul style="list-style-type: none"> • Partial Cystectomy • Cystotomy Repair • Enterocystoplasty • Ureteral Reimplant • Vesicovaginal Fistula Repair • Enterovesical Fistula Repair 	Peritonitis, urinoma, retroperitoneal abscess, failure of bladder repair, ureteral stricture, fistula between bladder and perineum/vaginal/abdominal wall	3 – 21 days after surgery Check with surgical team prior to removal
Transurethral Bladder Surgery	Hematuria, urinary retention, bladder perforation	0 – 14 days after surgery (concern for perforation) Check with surgical team prior to removal
Radiation Cystitis/Bladder Bleeding Syndromes	Recurrent hematoma, urinary retention, bladder perforation	Check with surgical team prior to removal
Suprapubic Tube	Loss of stoma tract, urinary retention	Check with surgical team prior to removal
Prostate		
Radical Prostatectomy	Urethral disruption, urethral stricture, urinoma	3 – 14 days after surgery Check with surgical team prior to removal
Simple Prostatectomy	Hematuria, urethral stricture, urinoma	3 – 14 days after surgery Check with surgical team prior to removal
Transurethral Prostate Surgery	Hematuria	1 – 7 days after surgery Check with surgical team prior to removal
Urethral		
Urethral Injury	Urethral disruption, urethral stricture, hematoma, urinoma	3 – 21 days from injury Check with surgical team prior to removal
Urethral Surgery/Primary Repair/Onlay Grafts	Hematoma, urethral disruption, urethral stricture, urethrocutaneous	3 – 21 days after surgery

	fistula	Check with surgical team prior to removal
Urethral Dilatation/Stricture Incision	Urinary retention, recurrent urethral stricture	0 – 3 days after surgery Check with surgical team prior to removal
Perineal Urethrostomy	Urethral stricture, urinary retention	3 – 14 days after surgery Check with surgical team prior to removal
<i>Urogynecology</i>		
Female Urogynecological Reconstructive Procedures <ul style="list-style-type: none"> • Pubovaginal Sling Procedures • Urethrolysis • Prolapse Repairs • Mesh Removal 	Urinary Retention, bleeding, urethral fistula	0 – 7 days after procedure Check with surgical team prior to removal
<i>Abdominal</i>		
Partial Nephrectomy	Perinephric hematoma, urinoma	Check with surgical team prior to removal
Continent Urinary Diversions (catheter per stoma)	Stoma stricture, stoma disruption, urine leak	3 – 21 days from surgery Check with surgical team prior to removal

SUMMARY STATEMENTS

1. CAUTIs are expensive and increase patient morbidity.
2. CAUTIs may be prevented.
3. Some clinical situations require long term IUCs, but many cases allow removal safely when no longer clinically necessary.
4. Check with the primary clinical/urologic surgical team prior to routine removal of IUCs.
5. Review medications prior to catheter removal in order to increase success and decrease potential complications.
6. Consider history of urologic condition (or voiding history) prior to removal.

ADDITIONAL RESOURCES

- Guidelines
 - [AUA Guideline: Urethral Stricture Disease \(2023\)](#)
 - [AUA Guideline: Management of Lower Urinary Tract Symptoms Attributed to Benign Prostatic Hyperplasia \(2023\)](#)
 - [AUA Guideline: Urotrauma \(2020\)](#)
 - [AUA/Canadian Urological Association \(CUA\)/Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction \(SUFU\) Guideline: Recurrent Uncomplicated Urinary Tract Infections in Women \(2022\)](#)
 - [AUA/SUFU Guideline: Adult Neurogenic Lower Urinary Tract Dysfunction \(2021\)](#)
 - [AUA/SUFU Guideline: Diagnosis and Treatment of Non-Neurogenic Overactive Bladder \(OAB\) in Adults \(2019\)](#)

- [European Association of Urology \(EAU\) Guideline: Urological Infections \(2022\)](#)
- [Infectious Diseases Society of America \(IDSA\) Guideline: Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria \(2019\)](#)
- Post-IUC Removal Bladder Management Resources
 - [Agency for Healthcare Research and Quality \(AHRQ\) Toolkit for Reducing Catheter-Associated Urinary Tract Infections in Hospital Units: Implementation Guide \(2015\)](#)
 - [UroToday: Bladder Management Algorithm - Post-Removal Indwelling Urinary Catheter \(IUC\) \(2021\)](#)
 - [Society of Urologic Nurses and Associates \(SUNA\): Bladder Management Following Foley \(Indwelling Urinary Catheter\) Removal](#)
- Toolkits and Other Resources
 - [A Program to Prevent Catheter-Associated Urinary Tract Infection in Acute Care \(2016\)](#)
 - [A Tiered Approach for Preventing Catheter-Associated Urinary Tract Infection \(2019\)](#)
 - [American Nurses Association \(ANA\) CAUTI Prevention Tool](#)
 - [AUA E-QIPS Guide: Multi-Disciplinary Development and Implementation of a Trial of Void Algorithm to Standardize and Reduce Indwelling Urethral Catheter Use](#)
 - [AUA Publication: Non-Neurogenic Chronic Urinary Retention: Consensus Definition, Management Strategies, and Future Opportunities \(2016\)](#)
 - [Centers for Disease Control and Prevention \(CDC\)/National Healthcare Safety Network \(NHSN\): Urinary Tract Infection \(Catheter-Associated Urinary Tract Infection \[CAUTI\] and Non-Catheter-Associated Urinary Tract Infection \[UTI\]\) Events \(2022\)](#)
 - [Cost of Health Care-Associated Infections in the United States \(2022\)](#)
 - [Descriptive Epidemiology and Outcomes of Hospitalizations with Complicated UTI in the US, 2018](#)
 - [Policies for Replacing Long-term Indwelling Catheters in Adults \(2016\)](#)
 - [SUNA Clinical Practice Procedure: Insertion of an Indwelling Catheter in the Adult Female \(2021\)](#)
 - [SUNA Clinical Practice Procedure: Insertion of an Indwelling Catheter in the Adult Male \(2021\)](#)
 - [SUNA Clinical Practice Procedure: Urinary Catheterization of the Adult Female \(2021\)](#)
 - [SUNA Clinical Practice Procedure: Urinary Catheterization of the Adult Male \(2021\)](#)
 - [SUNA Teaching Tool: Methods and Types of Urinary Catheters Used for Indwelling or Intermittent Catheterization \(2021\)](#)

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