Catheter-associated Urinary Tract Infection (CAUTI) Road Map

MHA’s road maps provide hospitals and health systems with evidence-based recommendations and standards for the development of topic-specific prevention and quality improvement programs, and are intended to align process improvements with outcome data. Road maps reflect published literature and guidance from relevant professional organizations and regulatory agencies, as well as identified proven practices. MHA quality and patient safety committees provide expert guidance and oversight to the various road maps.

Each road map is tiered into fundamental and advanced strategies:
- **Fundamental strategies** should be prioritized for implementation, and generally have a strong evidence base in published literature in addition to being supported by multiple professional bodies and regulatory agencies.
- **Advanced strategies** should be considered in addition to fundamental strategies when there is evidence the fundamental strategies are being implemented and adhered to consistently and there is evidence that rates are not decreasing and/or the pathogenesis (morbidity/mortality among patients) has changed.

**Operational definitions** are included to assist facility teams with road map auditing and identifying whether current work meets the intention behind each road map element.

**Resources** linked within the road map include journal articles, expert recommendations, electronic order sets and other pertinent tools which organizations need to assist in implementation of best practices.

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<td><strong>FUNDAMENTAL</strong></td>
<td>(check each box if “yes”)</td>
<td>Consider the following examples of patient education when developing teaching materials:</td>
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<td>□ The facility has a process in place to educate the patient about their urinary catheter [1].</td>
<td>• Centers for Disease Control <a href="#">FAQs about CAUTI</a></td>
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<td>- Education includes topics such as: symptoms of a urinary tract infection, catheter care, and what the patient can do to help prevent an infection.</td>
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<td>□ The facility has a process in place to educate patients being discharged with an indwelling catheter in place.</td>
<td>Consider the following examples when developing discharge education for patients:</td>
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<td>- The patient has been educated on how to care for the catheter and symptoms of infection using teach back method to ensure patient’s understanding.</td>
<td>• <a href="#">Intermountain Healthcare Foley Catheter: Home instructions</a></td>
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<td>• [The Ohio State University Home Care for Your Foley Catheter (Female)]</td>
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<td>• [The Ohio State University Home Care for Your Foley Catheter (Male)]</td>
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<td>• [The Ohio State University Home Care for Your Leg Bag]</td>
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| The facility has a policy/process for urinary catheter use.  
- Follow CDC/HICPAC indications for urinary catheter insertion and use.  
- Minimize perioperative urinary catheter use [Meddings et al. 2018].  
- Use urinary catheters only when necessary and consider the use of alternatives to urinary catheter placement (e.g., condom catheters, straight catheterization) [1,2,4]  
- Use a portable ultrasound device to assess the patient’s urine volume to reduce unnecessary catheter insertions prior to making a decision regarding catheter placement [1,3,4].  
- Facility sets clear expectations that indwelling catheter placement is not appropriate for the following reasons [1,3,4]: incontinence, specimen collection [4], diagnostic testing when the patient is able to void [4]. | Consider the following resources when developing or updating facility policies regarding urinary catheter use:  
- University of Wisconsin Policy for Insertion, Care and Removal of an Indwelling Urinary Catheter  
| The facility includes insertion criteria in the urinary catheter order process [2].  
- Utilize the electronic health record to hard wire insertion criteria into order. | Consider the following resources for incorporating insertion criteria into the urinary catheter order process:  
- Mayo CAUTI reduction presentation, 2016 CHAIN Fall Conference – EMR example  
- Mayo Clinic CAUTI reduction using bundled approach |

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| The facility utilizes a two-person “buddy” system for urinary catheter insertions where the second person completes the insertion checklist, observes for proper technique, and assists when needed [1]. | Consider the following examples when developing a standardized urinary catheter insertion checklist:  
- Pennsylvanina Patient Safety Authority Foley Insertion Checklist |
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<td>□ The facility utilizes a standardized insertion checklist [1].</td>
<td>• IPRO <a href="https://ipro.org">Foley Insertion Checklist</a></td>
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| Catheter insertion practices, continued | - Completed by a second person  
- Checklist includes:  
  ○ Patient education prior to procedures.  
  ○ Review for catheter appropriateness, catheter alternatives and catheter order prior to insertion  
  ○ Use of as small of a catheter as possible to minimize bladder neck and urethral trauma [2,4].  
  ○ Step-by-step aseptic insertion technique including hand hygiene and the use of sterile equipment.  
  ○ Securing indwelling catheters to prevent movement and urethral traction.  
  ○ Documentation of whether buddy system was used.  
□ The facility utilizes a standardized insertion kit that supports insertion process [1]. | Antimicrobial/antiseptic-impregnated catheters have been studied as a potential means to prevent bacteriuria:  
• [Cochrane Database Systematic Review – Types of Indwelling Urethral Catheters for Short-Term Catheterisation in Hospitalised Adults](https://onlinelibrary.wiley.com/doi/abs/10.1002/14651858.CD008849)  
|                  | ADVANCED (check each box if “yes”) □ Consider implementation of antimicrobial/antiseptic-impregnated catheters [4]. |                                                                                              |
| Catheter maintenance practices |                                                                                                             | Catheter care and maintenance is a critical component of CAUTI prevention. Consider the following resources when developing your catheter care and maintenance processes:  
• [University of Wisconsin Policy for Insertion, Care and Removal of an Indwelling Urinary Catheter](https://health.wisc.edu)  
• [Vanderbilt University Medical Center Guidelines for Management of Indwelling Urinary Catheters](https://www.vanderbiltmedicine.org) |
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| Catheter maintenance practices, continued | - Maintaining unobstructed urine flow keeping the catheter and tubing free of kinking [1-4].  
- Positioning the collecting bag below the level of the bladder and above the floor at all times [1-4].  
- Emptying the collecting bag regularly using a clean, collecting container for each patient; avoid splashing, and preventing contact of the drainage spigot with the non-sterile collecting container [1,2,4].  
- Securing indwelling catheters to prevent movement and urethral traction [1,2,4]  
- Disconnecting the catheter from the drainage tube only if the catheter must be irrigated.  
- Using aseptic technique if the collecting system needs replacement [1,2,4].  
☐ The facility has a standardized process in place for the provision of periurethral care.  
- Standard processes follow routine hygiene (e.g., cleansing of the meatal surface during daily bathing or showering) [1,2,4].  
☐ The facility has a process to ensure appropriate urine sampling practices.  
- Collect through the sampling port with a sterile syringe using disinfectant to clean the port prior to obtaining the sample [2-4].  
- For larger samples, use aseptic technique to remove sample from drainage bag [1,2]. | Facilities should review the following clinical guidelines when establishing standardized practice and indications for obtaining urine cultures:  
- Diagnosis, Prevention, and Treatment of Catheter-Associated Urinary Tract Infection in Adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America  
- Guidelines for evaluation of new fever in critically ill adult patients: 2008 update from the American College of Critical Care Medicine and the Infectious Diseases Society of America |
### Road map sections

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<td>• Prior to urologic surgeries where mucosal bleeding anticipated or transurethral resection of prostate - Early pregnancy (avoid urinary catheters if possible) - Discourages the following practices [3]: • Urine cultures to screen patients on admission (in the absence of CAUTI symptoms) • Standing orders for urine cultures in the absence of an appropriate indication • Urine quality (pyuria, odor, color, turbidity) to trigger urine culture • Ordering urine cultures without a clinical assessment of the patient’s condition; ensure that the signs and symptoms are compatible with CAUTI per IDSA Recommendations [3] Pan culturing (i.e., requesting multiple specimens and tests at once in an attempt to identify a possible infection) • Reflex orders for urine cultures based on urinalysis results for catheterized patients; each urinalysis result should be evaluated prior to urine culture order • Repeat urine cultures to document clearing of bacteriuria</td>
<td>Consider the following resources when developing processes to evaluate practices and indications regarding the appropriateness of urine culture orders: • CAUTI Pocket Card for CAUTI Evaluation, Hartley • Hennepin Healthcare “The CAUTI Can-Can” webinar • Hennepin Healthcare Urine Culture Algorithm • Mayo CAUTI reduction presentation, 2016 CHAIN Fall Conference • Mayo Clinic CAUTI reduction using bundled approach online • Sample Pocket Cards to Remove Urinary Catheters for Physicians and Nurses • Nebraska Medical Center Urinary Tract Infection and Asymptomatic Bacteriuria Guidance • Fakih MG, Khatib R. Improving the Culture of Culturing: Critical Asset to Antimicrobial Stewardship. Infection Control &amp; Hospital Epidemiology. 2017;38(3):377-379. Available online. • Maryland Campaign for Appropriate Antibiotic Use (CAAUSE) Asymptomatic Bacteriuria Algorithm • Infectious Diseases Society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults • Maryland Campaign for Appropriate Antibiotic Use (CAAUSE) Asymptomatic Bacteriuria Practice Treatment Guidelines • CDC Clinician Guide for Collecting Cultures • Morgan DJ, Malani P, Diekema DJ. Diagnostic Stewardship—Leveraging the Laboratory to Improve Antimicrobial Use. JAMA. 2017;318(7):607-608. <a href="https://jamanetwork.com/journals/jama/article-abstract/2647071">https://jamanetwork.com/journals/jama/article-abstract/2647071</a> • Madden G, Weinstein R, Sifri C. Diagnostic Stewardship for Healthcare-Associated Infections: Opportunities and Challenges to Safely Reduce Test Use. Infect Control Hosp Epidemiol. 2018;39(2):214-218. Available at <a href="https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/diagnostic-stewardship-for-healthcareassociated-infections-opportunities-and-challenges-to-safely-reduce-test-use/E2E185BF9CF7D0C9CAB0A8395ED5FEC9">https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/diagnostic-stewardship-for-healthcareassociated-infections-opportunities-and-challenges-to-safely-reduce-test-use/E2E185BF9CF7D0C9CAB0A8395ED5FEC9</a></td>
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<td>The facility has a process in place that addresses screening of catheter-associated asymptomatic bacteriuria. • Specifically, avoid screening patients for asymptomatic bacteriuria except for patients with selected conditions (e.g., undergoing urologic procedures, pregnancy) [2,3,6,7] and patients at high risk for urinary tract infection [5].</td>
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<tr>
<td>The facility has a process in place that addresses treatment of catheter-associated asymptomatic bacteriuria (presence of bacteria in urine culture without signs/symptoms of CAUTI). • Specifically, avoid the use of antimicrobials for asymptomatic bacteriuria except for patients with selected conditions (e.g., undergoing urologic procedures, pregnancy) [2,3,6,7].</td>
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<td>The facility has a process in place to evaluate uncommunicative, febrile patients whereby an alternative explanation of fever is assessed prior to urine evaluation [5,8].</td>
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<td>The facility has a process in place to conduct periodic audits on urine culturing practice patterns to determine trends (e.g., among provider groups, specialties, units) [1].</td>
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| **Indwelling catheter removal** | FUNDAMENTAL  
(check each box if “yes”)  
☐ The facility conducts a daily review of catheter necessity [1,2,4].  
  - Consider incorporating into already established rounds  
  - Utilizing electronic or other reminders such as an automatic stop order that requires review of catheter indications and renewal of indwelling catheter order [1-4].  
☐ Practice hand hygiene immediately prior to the removal of the catheter [2].  
☐ Evaluate the need for reinsertion post catheter removal e.g., bladder scanner to assess urinary retention.  
☐ The facility has implemented a nurse-driven protocol to empower nurses to evaluate and discontinue unnecessary urinary catheters [1-3]. | Conducting a daily review of catheter necessity is an important strategy to help prevent CAUTI, as prolonged catheterization is the strongest risk factor for infection. Consider the following resources to support this practice:  
  • Example Policy: [Automatic Discontinuance Order for Foley Catheter Use](#)  
  • IPRO [Foley Catheter Daily Tracking Sheet](#)  
Nurse-driven urinary catheter removal protocols help minimize prolonged catheterization. Several resources and sample protocols are included below:  
| **Performance improvement monitoring** | FUNDAMENTAL  
(check each box if “yes”)  
☐ The facility’s medical record is designed to capture sufficient detail to allow for review of adherence to appropriate practices for catheter use, insertion, maintenance, and removal.  
  - Includes: alternatives attempted, indications for catheter insertion [2,4], date and time of insertion/removal [2,4], daily review of continued need for catheter use [2], ongoing catheter maintenance [2], names of all health care personnel (HCP) and prescribers providing catheter care.  
☐ The facility conducts audits of insertion criteria selected with available clinical information [1-4].  
☐ The facility conducts CAUTI surveillance using standardized definitions and reviews metrics on a regular basis. [1,2,4].  
  - Utilize National Healthcare Safety Network (NHSN) definitions  
  - Metrics include: CAUTI rates, days since last CAUTI, urinary catheter utilization rates  
☐ The facility has a process in place to review and summarize learnings from every CAUTI with clinical team [1]. | The National Healthcare Safety Network (NHSN) provides standardized definitions for CAUTI through their [Urinary Tract Infection Events Protocol](#).  
Consider use of the [NHSN Standardized Utilization Ratio (SUR)](#) to further support internal improvement activities with an external comparison relative to catheter removal in addition to tracking number of device days.  
Consider the following example audit tools to support regular review of best practice implementation:  
  • [CDC Targeted Assessment for Prevention (TAP) Strategy: framework for quality improvement](#)  
  • [Helen DeVos K-card: CAUTI](#)  
  • [Abbott Northwestern Hospital Foley Maintenance and Indication Rounding Forms](#) |
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| Performance improvement monitoring, continued | □ A process is in place to provide feedback to patient care staff regarding adherence to appropriate catheter use, insertion, maintenance, and removal practices.  
- Process measures (e.g., catheter appropriateness, compliance with catheter insertion practices, compliance with catheter maintenance practices, catheter insertion by units/areas [such as the emergency department]) are evaluated on a regular basis. | Regular review of urinary catheter practices and use of the root cause analysis (RCA) process can be useful in examining the root cause of each CAUTI that occurs and identify key learning opportunities to prevent future events.  
• AHRQ Learn from Defects tool  
• CUSP CAUTI SBAR (Situation, Background, Assessment, Recommendation) Template  
• Hennepin Healthcare Unit Based CAUTI Review  
• CAUTI Inpatient Rounding Tool  
• CAUTI Pocket Card for CAUTI Evaluation, Hartley |
| Infrastructure | **FUNDAMENTAL**  
(check each box if “yes”)  
□ The facility has a multidisciplinary team to engage staff and guide CAUTI prevention efforts that includes leadership, physicians, and nursing.  
□ The facility has identified a CAUTI champion that reports to an interdisciplinary performance improvement structure supported by leadership, physicians, and nursing [1,2].  
□ The facility involves front-line staff as local champions of CAUTI prevention efforts [1,2]. | Engaging a multidisciplinary team in CAUTI prevention efforts is a critical component of infection prevention.  
| Staff education | **FUNDAMENTAL**  
(check each box if “yes”)  
□ The facility has education in place for providers, residents, and all health care personnel who insert/remove urinary catheters [1-4] incorporated into training on hire and at least annually.  
- Includes: CAUTI education, appropriate adherence to aseptic technique for insertion, appropriate use of catheters (including appropriate indications for insertion and maintenance), proper maintenance of catheters, practices and indications for obtaining urine cultures, potential adverse effects of inappropriate urine | Provider skill in insertion and removal of urinary catheters is an important component of safety and prevention of CAUTI. It is important to regularly educate and assess competency.  
• Bard Medical [Insertion and Removal Skills Training Checklist](https://www.bardmedical.com)  
• Pennsylvania Patient Safety Authority [Foley Catheterization: Female Performance Checklist](https://ppsa.pennmedicine.org)  
• Pennsylvania Patient Safety Authority [Foley Catheterization: Male Performance Checklist](https://ppsa.pennmedicine.org)  
• Vanderbilt [Urinary Catheter Insertion Skills Competency](https://www.vanderbilt.edu) |
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| Staff education, continued | cultures such as increased utilization due to testing/antimicrobials/consults, identification and removal of catheters that are no longer needed, and adherence to hand hygiene.  
- The facility provides hands-on training with competency evaluation for providers, residents, and all health care personnel allowed to insert/remove urinary catheters [1-4] incorporated into training on hire and at least annually.  
- Includes appropriate indications for catheter use and proper aseptic insertion/removal practices.  
- The facility has a process to ensure that providers, residents, and all health care personnel providing catheter care/maintenance are qualified and trained in urinary catheter care/maintenance.  
- The facility provides hands-on training with competency evaluation for providers, residents, and all health care personnel allowed to provide catheter care/maintenance incorporated into training on hire and at least annually. | • APIC/HRET *Stop catheter-associated urinary tract infections (CAUTI) in critically ill patients*  
• *Hennepin Healthcare Myths and Truths About UTIs* |

**REFERENCES**


