



LOSE THE TUBE.

A toolkit for appropriate use of urinary catheters in hospitals

Don't place or leave in place a urinary catheter without reassessment.

Canadian Society of Hospital Medicine,
Choosing Wisely Canada recommendation #1.

Don't place, or leave in place, urinary catheters without an acceptable indication (such as critical illness, obstruction, palliative care).

Canadian Society of Internal Medicine,
Choosing Wisely Canada recommendation #2.

Early Removal of Unnecessary Urinary Catheters on Inpatient Wards



Introduction

This toolkit was created to support the implementation of interventions designed to reduce unnecessary urinary catheters in your hospital. It can be used by physician groups, clinical services or organizations to help achieve significant reductions in overuse of urinary catheters. This particular module is designed to address the problem of urinary catheters being left in place longer than necessary. The interventions described here are intended to support **early removal** of unnecessary urinary catheters on **inpatient wards**.



Make sure this tool kit is right for you

This tool kit is well suited for your institution, if you have confirmed that overuse of urinary catheters is largely related to urinary catheters being left in place longer than necessary. Prior studies suggest that up to 40% of the time, physicians are unaware that their patient still has a urinary catheter.¹ In a busy clinical environment, urinary catheters are often a lower priority for clinical teams and may be left in place for several days after they are no longer being used to guide patient management.



Key ingredients of this intervention

If this description accurately reflects your current patient environment, this module may help your institution reduce urinary catheter overuse by introducing the following changes:

- Consensus criteria for leaving a urinary catheter in place on the ward
- Pro-active removal of those urinary catheters no longer meeting one of these acceptable indications
- Standardized post-catheter care following urinary catheter removal

Achieving Physician Consensus Regarding Appropriate Indications For Urinary Catheterization

Achieving consensus among physicians regarding the appropriate indications for urinary catheterization is a crucial step in development of all interventions to reduce urinary catheter use. As a starting point to creating discussion regarding appropriate indications for urinary catheterization in your patient population, guideline-based criteria should be consulted. Since 2009, the Healthcare Infection Control Practices Advisory Committee (HICPAC) to the Centre for Disease Control and Prevention (CDC), has recommended a list of appropriate and inappropriate indications for indwelling urinary catheter placement².

HICPAC criteria for appropriate clinical indications for urinary catheter placement

- Acute urinary retention or obstruction
- Accurate measurement of urinary output in critically ill patients
- Perioperative use in selected surgeries
- Assistance with healing of stage III or IV perineal and sacral wounds in incontinent patients
- Comfort or palliative care
- Required immobilization for trauma or surgery

Other examples of consensus-based criteria for appropriate urinary catheterization have been developed at Sunnybrook Health Sciences Centre, in Toronto, for specific patient populations and can be modified to suit your own local context.

Appropriate indications for urinary catheterization for general medicine patients

- Pre-admission permanent indwelling catheter
- Bladder outlet obstruction (urology is consulting)
- Continuous bladder irrigation (CBI) for gross hematuria
- Stage 3 sacral ulcers and incontinence in females
- Comfort care in end of life as per patient wishes
- Serum sodium < 120 AND physician order for strict ins/outs

Appropriate indications for urinary catheterization for general surgical patients

- Pre-admission permanent indwelling catheter
- Patient admitted under urology or being consulted by urology
- Continuous bladder irrigation for gross hematuria
- Stage 3 or 4 sacral ulcer in incontinent female patient
- Comfort care in end of life as per patient wishes
- Spinal cord injury
- Underwent one of the following surgeries: Radical pelvic surgery for cancer including that involving the bladder (e.g. anterior exenteration), uterus (radical hysterectomy), cervix (trachelectomy) or vulvectomy.

To adequately engage physicians in discussion, the improvement team needs to ensure that physicians recognize that their input is necessary to ensure the safety of urinary catheter removals. The ultimate goal is to achieve consensus between all physicians of your patient area before proceeding to the next step.

Engaging nurses in urinary catheter initiative

Nurse input is extremely valuable to ensure that an appropriate post-catheter care protocol is in place³. To engage nurse managers and front-line nurses, this intervention should be promoted as empowering them to play a more active role in catheter-associated UTI prevention, rather than creating additional work for them. It will be important to highlight the extra time that nurses currently spend asking physicians to re-assess urinary catheters and awaiting an order. A future state where urinary catheter discontinuation is standardized will lead to improved efficiency and time-savings for nurses. Nurses who use a urinary catheter removal protocol report improved job ease⁴.

Selecting an “early removal” urinary catheter intervention

Once physician consensus has been reached regarding the criteria for appropriate urinary catheter use, and nurses have been engaged in the process, you are now ready to deploy a specific intervention to promote urinary catheter removal for patients lacking these pre-specified criteria.

1) Auto-stop orders⁵:

This strategy limits duration of UC at the time of UC order placement by specifying an expiration date at which time the default is removal of the urinary catheter, unless re-ordered by the physician⁵.

Steps to implementation:

- A)** Choose the most appropriate auto-stop date through consensus among physicians (eg. 24 or 48-hours are typical durations).
- B)** Build the stop order into the written admission orderset. If your hospital has computerized physician order entry (CPOE) system, it is worth checking whether this can be programed into the electronic orderset.
- C)** Make it explicit in the stop order, the reasons for appropriate urinary catheter use that should be excluded. This step is important to ensure that nurses and physicians recognize the appropriate reasons for urinary catheterization to avoid inappropriate removal.

- D) Each time an order for UC expires, the UC can be removed automatically or the physician can be prompted to re-assess its use. At some institutions, the automatic stop-order would prompt nurses to obtain an order for discontinuation of the UC. With appropriate training, nurses can be empowered to remove the UC automatically through the use of a medical directive as described below³.

2) Physician reminder⁶:

Physician reminders can take many forms including implementing a “time out” for daily discussion about UC appropriateness each day during rounds or alerts in the electronic medical record⁶.

Steps to implementation:

- A) Identify a way of prospectively keeping track of each patient with a urinary catheter on the ward. This may occur by meeting with nurses each day during a team huddle or by implementing an IT solution to generate an alert for each patient with an indwelling urinary catheter to prompt a daily re-assessment by physicians.
- B) Provide adequate education among physician groups about the consensus-based criteria for appropriate urinary catheterization. This step is important to ensure that physicians are re-assessing and discontinuing inappropriate urinary catheters based on these criteria, and not simply based on their previous practice patterns.
- C) Implement the reminder system and get feedback from physicians about whether it is helpful. Ensure to also implement a way of turning off the physician reminder (either written or electronically) for patients who have an appropriate indication that is chronic.
- D) Based on feedback received, adjust the reminder system to ensure that it is working optimally.

3) Medical directive for urinary catheter removal^{3,8}:

Medical directives can be created to empower nurses to remove urinary catheters for patients who lack one of the consensus-based appropriate indications for ongoing use. Strong nurse leadership and organizational support is necessary to ensure success of this intervention.

Steps to implementation:

- A) After consensus has been reached regarding appropriate indications for urinary catheter use, perform usability testing with some of the nurses from the ward looking to implement the directive. This means giving them fictional cases to ensure that nurses can readily recognize these indications and act on the information in specific situations. Input from nurse leaders and educations (see section on nurse engagement above) is crucial to ensure that the list of criteria are operationalized for use by front-line nurses.

- B) Provide training for all front-line nurses (generally 30 minutes is adequate) on how to use the medical directive and provide clinical cases to practice using it. What the medical directive gives nurses the authority to do, and when they are required to call the physician should be made explicit.
- C) Once piloted successfully and working well, a policy regarding the medical directive may be helpful to ensure adherence and quality assurance of this model of care. Training on how to follow the medical directive should be included in orientation of all new staff.

Paying attention to post-catheter care

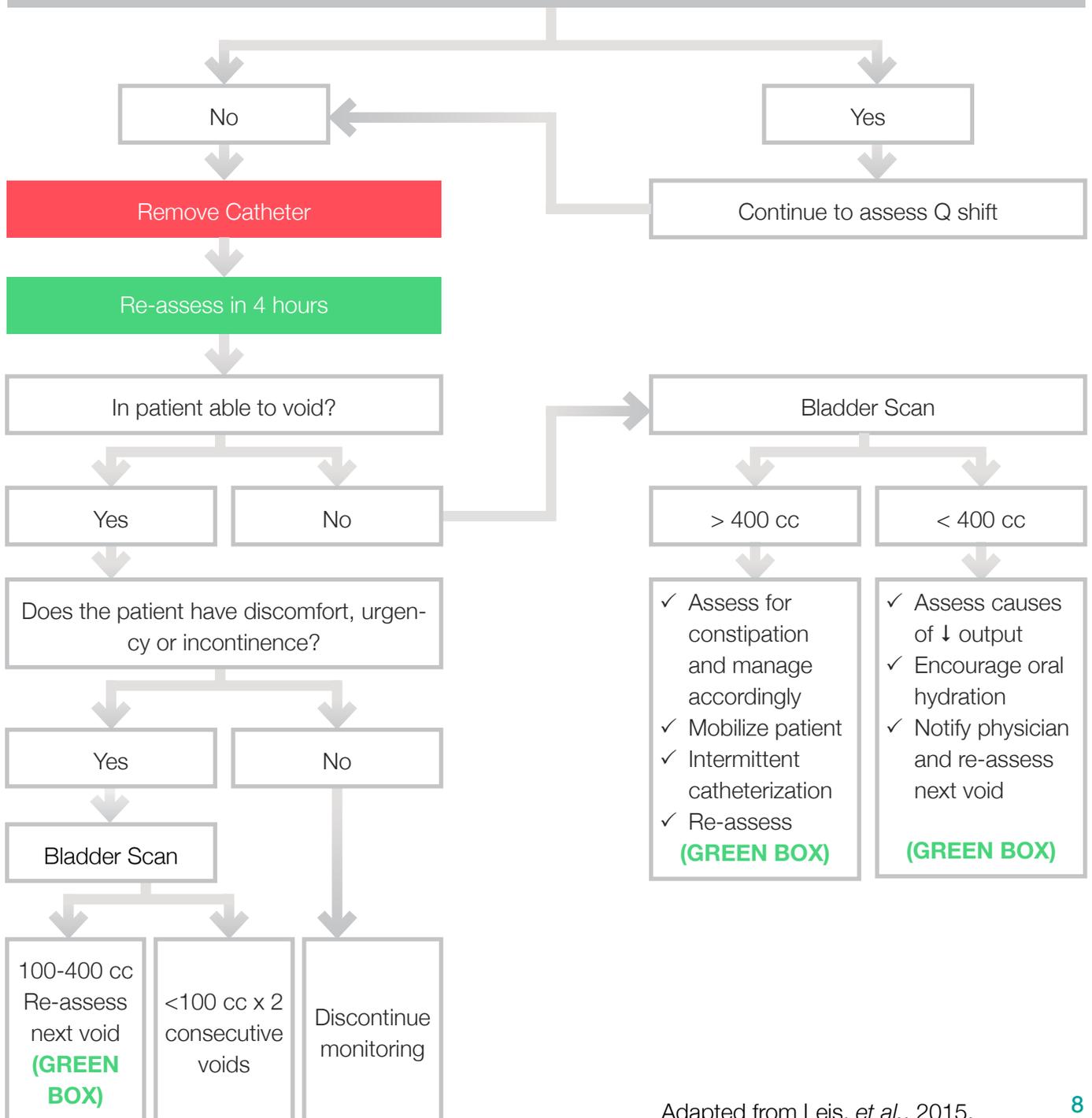
Early removal of urinary catheters is only the first step to reducing unnecessary urinary catheter days. Once a catheter is removed, some patients will be unable to void on their own. Post-catheter care is an essential part of any intervention aimed at promoting early urinary catheter removal to promote bladder re-training, minimize re-insertion of indwelling urinary catheter, and prevent acute urinary retention that can lead to detrusor injury^{3,8}. Active management to avoid bladder overdistension, including early intermittent catheterization as needed, may protect the bladder from permanent myogenic damage⁹. The following is an example of a post-catheter care algorithm that has been used among general medical ward patients:

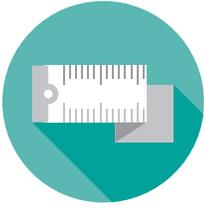
Medical Directive For Early Removal of Urinary Catheters in Medical Ward Patients

Exclusion Criteria

Pre-admission permanent indwelling catheter
 Bladder outlet obstruction (urology is consulting)
 Continuous bladder irrigation for gross hematuria
 Stage 3 or 4 sacral ulcer in incontinent female patient
 Combat care in end of life as per patient wishes
 Serum sodium < 120 AND physician order for strict ins/outs

Does the patient meet any of the ABOVE criteria for leaving the Urinary Catheter in?





Measuring your performance

Choose a family of measures

The following are the most common measures used to evaluate intervention to reduce urinary catheter duration.

- 1) Outcome measures: These are the main improvements that you are trying to achieve.
Catheter days per patient days
Other clinical outcome(s) of interest:
 - CAUTIs per 1000 patient days
 - CAUTIs per 1000 catheter days
 - Average urinary catheter duration
- 2) Process measures: These measures are developed to ensure that each aspect of the intervention is being carried out and delivered as intended.
Eg. Proportion of providers who used the intervention
- 3) Balancing measures: Any intervention may create new unintended consequences that need to be measured.
Eg. Occurrence of any inappropriate removals of urinary catheters; or
Number of urinary catheter re-insertions compared to baseline

Determine a collection method

There are many ways to measure urinary catheter days in your institution. The first step is to decide on the measurement tool:

- 1) **Bedside audits:**
 - a) Count the number of urinary catheters on each unit (A)
 - b) Divide this number by the patient census on that day (B)
 - c) Urinary catheter days per inpatient days as a rate = $(A/B) \times 100\%$
 - d) These audits can be performed weekly or monthly by the improvement team or logged daily by front-line staff⁶ and plotted on a graph to visual effect over time and response to interventions
- 2) **Electronic nursing documentation:**
 - a) Some institutions utilize Task-Oriented Nurse Acuity Systems (TONAS) such as GRASP®, which allows nurses to record their daily activities. These systems can be used to capture urinary catheter use in an automated way¹⁰. A brief internal validation should be conducted to confirm that this automated source of data is accurate.
- 3) **Electronic medical record:**
 - a) For institutions that have CPOE, urinary catheter insertion and discontinuation orders can be monitored and used to infer urinary catheter duration¹¹. Meet with your hospital's CPOE provider and IT department to see whether an automated solution to measuring urinary catheters days is feasible at your institution.



Sustaining early successes

Once the intervention to reduce urinary catheter use has been implemented and refined resulting in significant reduction in urinary catheter days per patient days, there are several important ways to help sustain this performance:

- 1) Indication for appropriate urinary catheter use in the selected patient population should become institutional policy. This information should be provided to all new nurses and physicians joining the institution. Posters of these indications can be created to display them on inpatient units.
- 2) If a medical directive is implemented that involves nurses, annual in-services to maintain competency of front-line nurses may be necessary. Periodic measurement and feedback to nurses and physicians is important in confirming sustainability. Local nurse leaders and Infection Prevention and Control play important roles in ensuring ongoing education and training through spot audits and feedback.



Additional resources

Urinary catheter resources:

- 1) Catheterout.org
- 2) AHRQ Toolkit for Reducing CAUTI in Hospitals: <http://www.ahrq.gov/professionals/quality-patient-safety/hais/tools/cauti-hospitals/index.html>

QI resources:

- 1) HQO: <http://qualitycompass.hqontario.ca/portal/getting-started#.VqJNBsd6wUg>
- 2) IHI: <http://www.ihl.org/resources/Pages/HowtoImprove/default.aspx>



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- 2) <http://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIGuideline2009final.pdf>
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- 11) Wald HL, Richard AA, Bandle B, Min SJ. Accuracy of electronic surveillance of catheter-associated urinary tract infection at an academic medical center. *Infect Control Hosp Epidemiol* 2014; 35: 685-91.

Restrictive Insertion Of Urinary Catheters In Operating Rooms



Introduction

This toolkit was created to support the implementation of interventions designed to reduce unnecessary urinary catheters in your hospital. It can be used by physician groups, clinical services or organizations to help achieve significant reductions in overuse of urinary catheters. This particular module is designed to address the problem of inappropriate use of urinary catheters in the operating room. The interventions described here are intended to support **restrictive insertion** of unnecessary urinary catheters during **surgery**.



Make sure this tool kit is right for you

This tool kit is well suited for your institution, if you have confirmed that overuse of urinary catheters is largely related to patients having an indwelling urinary catheter insertion for surgical procedures that may be unnecessary. In most hospitals, urinary catheters are placed by anesthesiologists in the operating room (OR) and post-anesthesia care unit before patients are transferred to the ward. If you are finding that urinary catheter placement occurs on a routine basis even for short uncomplicated surgeries, this toolkit may help you develop an intervention to restrict the situations in which urinary catheters are used in the OR.



Key ingredients of this intervention

If this description accurately reflects your current patient environment, this module may help your institution reduce urinary catheter overuse by introducing the following changes:

- Consensus criteria for inserting a urinary catheter in the operating room
- A shift from routine use of urinary catheters in the OR to using them only for specific procedures that warrant them for intra-operative management.

Achieving consensus regarding appropriate indications for urinary catheterization

Sometimes urinary catheters are inserted in the operating room by convention without a strong rationale or supporting evidence. For example, a common misperception is that all patients with spinal or epidural anesthesia will need a urinary catheter even though many surgeries can be successfully performed without one¹. It will be important for your organization to engage all practicing surgeons in discussion around the surgical procedures that require an indwelling urinary catheter. Members from anesthesia should also be consulted to come up with this list of indications.

As a starting point to these discussions for your organization, it may be helpful to consider the list of indications that were successfully implemented in a prior improvement study among patients who were undergoing orthopedic surgery¹:

Indications for urinary catheter insertion prior to orthopedic surgery

- Intervention with a foreseen duration of surgery > 5-hours
- Total hip replacement only in one of the following situations: 1) patient >75 years, 2) ASA class ≥ 3 , 3) obesity or 4) urinary incontinence.
- Total knee replacement only if one of the following situations: 1) patient > 80 years, 2) obesity or 3) urinary incontinence.

Another example of a consensus-based criteria for appropriate urinary catheterization has been implemented at Sunnybrook Health Sciences Centre, Toronto, Ontario, where they have restricted insertion of urinary catheters to the following procedures:

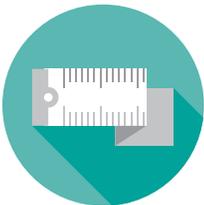
Indications for placement of indwelling urinary catheter in the operating room at Sunnybrook Health Sciences

- Any intervention with a foreseen duration of surgery > 5-hours
- Any urology surgery
- Unstable spine or acute spinal cord injury
- Radical pelvic surgery for cancer including that involving the bladder (e.g. anterior exenteration), uterus (radical hysterectomy), cervix (trachelectomy) or vulvectomy

To adequately engage all the surgeons in discussion in your organization, the improvement team needs to ensure that surgeons recognize that their input is necessary to ensure that the patients who cannot have surgery without a urinary catheter are included in these criteria. The ultimate goal is to achieve consensus between all surgeons of your hospital before proceeding to the next step.

Implementing restrictive insertion of urinary catheters in the operating room¹

- 1) After input has been received and consensus reached, circulate a draft for official endorsement by all anesthesiologists and surgeons.
- 2) Create posters illustrating the guidelines near the ORs and post-anesthesia care units to serve as a reminder.
- 3) Perform an early audit (eg. After 1-month) to determine if the guidelines are being followed and to get feedback from staff. The easiest way to perform this audit is to review the anesthesia record about whether a urinary catheter was placed.
- 4) Based on the feedback received, the indications for urinary catheter insertion can be refined further.



Measuring your performance

Choose a family of measures

The following are the most common measures used to evaluate intervention to reduce urinary catheter insertion.

- 1) Outcome measures: These are the main improvement that you are trying to achieve. In this case, “Catheter days per patient days” on the ward would likely be the main outcome you are trying to reduce by having less patients transferred to the ward with an indwelling urinary catheter.
- 2) Process measures: These measures are developed to ensure that each aspect of the intervention is being carried out and delivered as intended. In this case, the process measure would likely be the proportion of patients who have a urinary catheter placed in the OR without one of the consensus-based indications. Your improvement initiative should result in a reduction of this unnecessary urinary catheter use in the OR and if this has not occurred, the implementation strategy should be re-assessed.
- 3) Balancing measures: Any intervention may create new unintended consequences that need to be measured. Because this intervention is aimed at restricting urinary catheter placement in the OR to specific surgeries, the balancing measure in this case is to ensure that no patients who had an indication for urinary catheterization was left un-catheterized. You may also wish to review cases where urinary catheters had to be inserted in the middle of a case to determine if there was an important clinical reason that might need to be explored further.

Determine a collection method

There are many ways to measure urinary catheter days in your institution. The first step is to decide on the measurement tool:

- 1) Bedside audits:
 - a) Count the number of urinary catheters on each unit (A)
 - b) Divide this number by the patient census on that day (B)
 - c) Urinary catheter days per inpatient days as a rate = $(A/B) \times 100\%$
 - d) These audits can be performed weekly or monthly by the improvement team or logged daily by front-line staff² and plotted on a graph to visual effect over time and response to interventions
- 2) Electronic nursing documentation:
 - a) Some institutions utilize Task-Oriented Nurse Acuity Systems (TONAS) such as GRASP®, which allows nurses to record their daily activities. These systems can be used to capture urinary catheter use in an automated way³. A brief internal validation should be conducted to confirm that this automated source of data is accurate.
- 3) Electronic medical record:
 - a) For institutions that have CPOE, urinary catheter insertion and discontinuation orders can be monitored and used to infer urinary catheter duration⁴. Meet with your hospital's CPOE provider and IT department to see whether an automated solution to measuring urinary catheters days is feasible at your institution.



Sustaining early successes

Once the intervention to reduce urinary catheter insertion in the operating room has been implemented and refined resulting in significant reduction in urinary catheter days per patient days on surgical wards, there are several important ways to help sustain this performance:

- 1) The indications for urinary catheter insertion in the OR should be formalized as part of your institutional policy. This information should be provided to all new nurses and physicians joining the institution. Updated posters of these indications can be created to display them around the OR.
- 2) Periodic measurement and feedback to surgical staff is important in confirming sustainability. Operating Room Nurses and Infection Prevention and Control practitioners play important roles in ensuring ongoing education and training through spot audits and feedback.



Additional resources

Urinary catheter resources:

- 1) Catheterout.org
- 2) AHRQ Toolkit for Reducing CAUTI in Hospitals: <http://www.ahrq.gov/professionals/quality-patient-safety/hais/tools/cauti-hospitals/index.html>

QI resources:

- 1) HQO: <http://qualitycompass.hqontario.ca/portal/getting-started#.VqJNBsd6wUg>
- 2) IHI: <http://www.ihl.org/resources/Pages/HowtoImprove/default.aspx>



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- 4) Wald HL, Richard AA, Bandle B, Min SJ. Accuracy of electronic surveillance of catheter-associated urinary tract infection at an academic medical center. *Infect Control Hosp Epidemiol* 2014; 35: 685-91.

Restrictive Insertion of Urinary Catheters in Emergency Departments



Introduction

This toolkit was created to support the implementation of interventions designed to reduce unnecessary urinary catheters in your hospital. It can be used by physician groups, clinical services or organizations to help achieve significant reductions in overuse of urinary catheters.

This particular module is designed to address the problem of inappropriate use of urinary catheters in the emergency department. You have selected the module to support **restrictive insertion** of urinary catheters in the **emergency department**.



Make sure this tool kit is right for you

This tool kit is well suited for your institution, if you have confirmed that overuse of urinary catheters is largely related to inappropriate insertion of urinary catheters among patients being admitted through the emergency department. Prior research suggests that the majority of urinary catheters inserted in the emergency department (ED) are avoidable¹.



Key ingredients of this intervention

If this description accurately reflects your current patient environment, this module may help your institution reduce urinary catheter overuse by introducing the following changes:

- Consensus criteria for inserting a urinary catheter in the ED
- Physician and nurse education regarding appropriate indications for urinary catheterization
- Overcoming barriers to avoiding indwelling urinary catheter insertion in the ED

Achieving physician consensus regarding appropriate indications for urinary catheterization

Achieving consensus among physicians regarding the appropriate indications for urinary catheterization is a crucial step in development of all interventions to reduce urinary catheter

use. A prior qualitative study created focus groups in an Emergency Department in New York, to identify conditions that require urgent IUC placement, those where alternative approaches to voiding should be considered, and those in which IUC should never be placed because the risk clearly outweighs the benefit². This categorization can be an excellent starting point to create discussion within your organization with the goal of developing standardization of indwelling urinary catheter use in the Emergency Department.

Protocol For Emergency Department Placement And Management Of Indwelling Urinary Catheters (IUCs) In Older Adults

Critical Diagnoses Requiring Urgent IUC Placement

- Critical illness requiring hourly I&O monitoring
- Acutely ventilated patients
- Acute Pulmonary Edema/CHF exacerbation requiring NIPPV
- Burns greater than 20% Total Body Surface Area
- Major trauma (per ATLS protocol)
- Orthopedic injuries requiring immobilization (pelvis, spine)
- Hip Fracture
- Spinal cord injury
- Acute Urinary Retention

Order and
place IUC

Critical Actions When Placing IUC:

- Sterile technique with new kit with each attempt
- Consider pain control with viscous lidocaine
- Tether to avoid traumatic or accidental removal
- Patient education re: safe ambulation

IUC Potentially Indicated, But Consider Alternatives

- Lower extremity injury requiring immobilization
- Maceration of perineal/sacral skin in setting of incontinence
- Palliative/comfort care

Consider
alternative

Alternate Modes Of Urine Collection:

- Straight catheter
- Texas/condom catheter
- Bedside commode (with measurement hat)
- Urinal/Bedpan
- Diaper
- Assistance to restroom

Try Alternate Urine Collection Before IUC

- Accurate I&O monitoring greater than one hour intervals
- CHF exacerbation (not requiring NIPPV)
- Pre-op without other indication

Attempt
alternative

Conditions In Which IUC Risks Outweigh Benefits

- | | | |
|----------------|--------------------------------|--------------------------|
| • Delirium | • Measuring post-void residual | • Morbid obesity |
| • Dementia | • Obtaining urine sample | • Patient/family request |
| • Incontinence | • Urinary Tract infection | • Patient refusal |
| • Bed-bound | • Alcohol Intoxication | • Convenience for care |

Do not place
IUC

Educating physicians on appropriate indications for urinary catheters

To adequately engage physicians in discussion, the improvement team needs to ensure that physicians recognize that their input is necessary to ensure that patients have a urinary catheter placed when necessary. In the development of urinary catheter appropriateness criteria, all ED physicians should be engaged and physician champions identified to promote uptake of the new indications. This strategy alone has been shown to reduce physician orders in the ED for urinary catheters by 40%³.

Educating nurses in urinary catheter initiative

To engage nurse managers and front-line nurses, this intervention should be promoted as empowering them to play a more active role in catheter-associated UTI prevention, rather than creating additional work for them. Centres in which nurses are educated on appropriate urinary catheter indications and aseptic insertion techniques experience lower catheter-associated UTIs and overall urinary catheter rates⁴⁻⁶.

Overcoming barriers in the Emergency Department

Even when physicians and nurses in the emergency department recognize the potential harms of indwelling urinary catheters, the practice of inserting an IUC is often resistant to change. A previous qualitative study identified eleven potential barriers to standardizing urinary catheter practice in the Emergency Department (Table). Addressing as many of these factors as possible will be a critical step to ensuring successful uptake of your intervention.

Potential barriers to restricting urinary catheter placement in the ED²

- | | |
|--|---|
| 1) Physician variability in practice | 6) Nursing variability in placement technique |
| 2) Physical location of patient in emergency department preventing placement (ie, hallway bed) | 7) Need for multiple attempts at placement causing increased infection risk |
| 3) Variations among inpatient services with regards to IUC placement | 8) Information technology support for orders and pop-up messages |
| 4) Concern that physical location of a patient in hospital should not dictate whether patient receives an IUC | 9) Variability in documentation practices |
| 5) Practicality of alternate modes of urine collection <ul style="list-style-type: none">• Lack of space for privacy needed for toileting with commode• Lack of supplies, including commodes and measurement hats• Lack of patient care support available for walking patients to restroom | 10) Variability in sign-out practices |
| | 11) Time management for ongoing reassessments |

Adapted from Mulcare, *et al.*, 2015.

Selecting a urinary catheter intervention

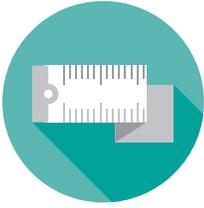
Once physician consensus has been reached regarding the criteria for appropriate urinary catheter use, and nurses have been engaged in the process, you are now ready to deploy a specific intervention to promote appropriate urinary catheter insertion.

Decision support/reminders⁵:

This strategy reinforces appropriate UC insertion at the time of UC order and serves as an educational tool.

Steps to implementation:

- 1) Create a visual reminder that displays the consensus indications for UC insertion. This may be paper-based or electronic.
- 2) Build decision support into the reminder: make it explicit in the reminder, the reasons for inappropriate urinary catheter use and provide alternatives for urine collection or insertion of urinary catheter. These include use of bladder scanners or intermittent catheterization to manage urinary retention, condom catheters in men for fluid monitoring, or bedside commodes for patients with limited mobility.
- 3) Perform an early audit (eg. After 1-month) to determine if the guidelines are being followed by the ED staff and to get feedback around how things are working. The easiest way to perform this audit is to review consecutive admitted patients to determine whether a urinary catheter was placed in the ED.
- 4) Based on the feedback received, the indications for urinary catheter insertion can be refined further.



Measuring your performance

Choose a family of measures

The following are the most common measures used to evaluate intervention to reduce urinary catheter duration.

- 1) Outcome measures: These are the main improvement that you are trying to achieve. In this case, “Catheter days per patient days” on the ward would likely be the main outcome you are trying to reduce by having less patients transferred to the ward from the ED, with an indwelling urinary catheter.
- 2) Process measures: These measures are developed to ensure that each aspect of the intervention is being carried out and delivered as intended. In this case, the process measure would likely be the proportion of patients who have a urinary catheter placed in the ED without one of the consensus-based indications. Your improvement initiative should result in a reduction of this unnecessary urinary catheter use in the ED and if this is not happening, the implementation strategy should be re-assessed.
- 3) Balancing measures: Any intervention may create new unintended consequences that need to be measured. Because this intervention is aimed at restricting urinary catheter placement in the ED to specific patients, the balancing measure in this case is to ensure that no patient with an indication for urinary catheterization was left uncatheterized. You may also wish to review cases where urinary catheters had to be inserted within 24 hours of admission to determine if there was an important clinical reason that might need to be explored further.

Determine a collection method

There are many ways to measure urinary catheter days in your institution. The first step is to decide on the measurement tool:

- 1) Bedside audits:
 - a) Count the number of urinary catheters placed in the ED over a unit of time (eg., 1 month) (A)
 - b) Divide this number by the number of patients admitted from the ED during the same period (B)
 - c) Urinary catheter placement per 100 admissions as a rate = $(A/B) \times 100\%$
 - d) These audits can be performed weekly or monthly by the improvement team or logged daily by front-line staff⁹ and plotted on a graph to visual effect over time and response to interventions
- 2) Electronic nursing documentation:
 - a) Some institutions utilize Task-Oriented Nurse Acuity Systems (TONAS) such as GRASP®, which allows nurses to record their daily activities. These systems can be used to capture urinary catheter use in an automated way⁹. A brief internal validation should be conducted to confirm that this automated source of data is accurate.

3) Electronic medical record:

- a) For institutions that have CPOE, urinary catheter insertion and discontinuation orders can be monitored and used to infer urinary catheter duration¹⁰. Meet with your hospital's CPOE provider and IT department to see whether an automated solution to measuring urinary catheters days is feasible at your institution.



Sustaining early successes

Once the intervention to reduce urinary catheter use has been implemented and refined resulting in significant reduction in urinary catheter placement, there are several important ways to help sustain this performance:

- 1) Indication for appropriate urinary catheter use in the emergency department should become institutional policy. This information should be provided to all new nurses and physicians joining the institution. Posters of these indications can be created to display them in the emergency department.
- 2) Periodic measurement and feedback to nurses and physicians is important in confirming sustainability. Local nurse leaders and Infection Prevention and Control play important roles in ensuring ongoing education and training through spot audits and feedback.



Additional resources

Urinary catheter resources:

- 1) Catheterout.org
- 2) AHRQ Toolkit for Reducing CAUTI in Hospitals: <http://www.ahrq.gov/professionals/quality-patient-safety/hais/tools/cauti-hospitals/index.html>

QI resources:

- 1) HQO: <http://qualitycompass.hqontario.ca/portal/getting-started#.VqJNBsd6wUg>
- 2) IHI: <http://www.ihi.org/resources/Pages/HowtoImprove/default.aspx>



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