Reducing CAUTI Rates: Practical Solutions for Improvement

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CAUTI Webinar
Healthcare-Associated Infections: Common, Costly, & Harmful

~1 million

Americans develop a healthcare-associated infection each year

• ~50% of infections could be prevented
• Preventive practices used inconsistently
Preventing Infection

Technical

Socio-adaptive
Outline

• CAUTI: Background
• Technical Issues in Preventing CAUTI
• 6 Steps
• Conclusions
Catheter-Associated Urinary Tract Infection (CAUTI)

- One of the most common infections
- 1/4 of inpatients receive catheters
- 1/3 of catheter days unnecessary
- 1/3 of physicians unaware their patient has a catheter
- 1/3 of the time no order for a catheter
Urinary Catheter-Related Infection: Pathophysiology

Organisms enter the bladder by **3 ways:**

1) At time of catheter insertion

2) Through the catheter lumen (from a colonized drainage bag)

3) Along external surface of the catheter (migrate along the catheter-mucosal interface)

The Foley also leads to non-infectious harms.
Indwelling Urinary Catheters: A One-Point Restraint?

Sanjay Saint, MD, MPH
Benjamin A. Lipsky, MD
Susan Dorr Goold, MD, MHSA, MA

16 July 2002
Determining the Noninfectious Complications of Indwelling Urethral Catheters
A Systematic Review and Meta Analysis

John M. Hollingsworth, MD, MS; Mary A.M. Rogers, PhD; Sarah L. Krein, PhD, RN; Andrew Hickner, MSI; Latoya Kuhn, MPH; Alex Cheng, MD; Robert Chang, MD; and Sanjay Saint, MD, MPH

“Many noninfectious catheter-associated complications are at least as common as clinically significant urinary tract infections.”
Complications of Foley Catheters—Is Infection the Greatest Risk?

Anne-Marie Leuck         Deborah Wright         LeAnn Ellingson         Linda Kraemer
Michael A. Kuskowski     James R. Johnson

From the VA Medical Center (AML, DW, LE, LK, MAK, JRJ), Department of Medicine (AML, JRJ) and Department of Psychiatry (MAK), University of Minnesota, Minneapolis, Minnesota
“…Foley catheter-related genitourinary trauma was as common as symptomatic UTI. Moreover… asymptomatic bacteriuria accounted for significantly more antimicrobial treatment than did symptomatic UTI. Elimination of unnecessary Foley catheter use could prevent symptomatic UTI, unnecessary antimicrobial therapy for asymptomatic bacteriuria and Foley catheter-related trauma.”
CAUTI Prevention & Patient Safety

- Pressure sores
- VTE
- Falls
- Immobility
- CAUTI
- Urinary Catheter Harm
- Trauma
- Increased Length of Stay
- Patient discomfort
- Patient discomfort
How can we reduce catheter use and decrease CAUTI?
Disrupting the Lifecycle of the Urinary Catheter

1. Preventing Unnecessary and Improper Placement

2. Maintaining Awareness & Proper Care of Catheters

3. Prompting Catheter Removal

4. Preventing Catheter Replacement

(Meddings. Clin Infect Dis 2011)
Disrupting the Lifecycle of the Urinary Catheter

1. Preventing Unnecessary and Improper Placement

4. Preventing Catheter Replacement

2. Maintaining Awareness & Proper Care of Catheters

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(Meddings. Clin Infect Dis 2011)
The Most Common Venue for Foley Placement?

Emergency Department
Indwelling Urinary Catheters Inserted in the Emergency Department (ED)

The “ED” is a very important factor in efforts to reduce the use of indwelling urinary catheters!

“The charge nurses [on the floor] say, ‘You know, they keep putting them in down in the ER and they come up to the floor, we don’t even have a Foley order’ ...they’re just in because the patient was incontinent or confused [in the ER].”

(Krein et al. JAMA Intern Med 2013)
# 2009 Prevention of CAUTI HICPAC Guidelines
(Gould et al, Infect Control Hosp Epidemiol 2010; 31: 319-326)

## Table 2.
### A. Examples of Appropriate Indications for Indwelling Urethral Catheter Use

<table>
<thead>
<tr>
<th>Indications</th>
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<tbody>
<tr>
<td>Patient has acute urinary retention or bladder outlet obstruction</td>
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<tr>
<td>Need for accurate measurements of urinary output in critically ill patients</td>
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<tr>
<td>Perioperative use for selected surgical procedures:</td>
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<td>- Patients undergoing urologic surgery or other surgery on contiguous structures of the</td>
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<tr>
<td>genitourinary tract</td>
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<tr>
<td>- Anticipated prolonged duration of surgery (catheters inserted for this reason should be</td>
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<tr>
<td>removed in PACU)</td>
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<tr>
<td>- Patients anticipated to receive large-volume infusions or diuretics during surgery</td>
</tr>
<tr>
<td>- Need for intraoperative monitoring of urinary output</td>
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<tr>
<td>To assist in healing of open sacral or perineal wounds in incontinent patients</td>
</tr>
<tr>
<td>Patient requires prolonged immobilization (e.g., potentially unstable thoracic or lumbar</td>
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<tr>
<td>spine, multiple traumatic injuries such as pelvic fractures)</td>
</tr>
<tr>
<td>To improve comfort for end of life care if needed</td>
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</tbody>
</table>
The Ann Arbor Criteria for Appropriate Urinary Catheter Use in Hospitalized Medical Patients: Results Obtained by Using the RAND/UCLA Appropriateness Method

Jennifer Meddings, MD, MSc; Sanjay Saint, MD, MPH; Karen E. Fowler, MPH; Elissa Gaies, MD, MPH; Andrew Hickner, MSI; Sarah L. Krein, PhD, RNI; and Steven J. Bernstein, MD, MPH

In Pursuit Appropriate Urinary Catheter Indications: Details Matter

Carolyn V. Gould, MD, MSCR
Alternatives to Consider

1) Accurate daily weights
2) Urinal/commode/bedpan
3) Condom catheters
4) Intermittent catheterization with bladder scanning
Avoiding Indwelling Catheter Insertion in the ED

Interventional studies in the ED to reduce insertion:

1) Gokula et al. ER staff education and use of a urinary catheter indication sheet improves appropriate use of Foley catheters, Am J Infect Control, 2007: 75% fewer indwelling catheters inserted after the intervention

2) Fakih et al. Effect of establishing guidelines on appropriate urinary catheter placement. Acad Emerg Med. 2010: 40% fewer insertions after the intervention

1) Encouraged clear institutional indications for catheter insertion

2) Identified 1 nurse and 1 physician champion for each ED

3) Provided data each quarter

- Reduced catheter use by a third
- The results sustained for >6 mos
But if the patient really, really needs a Foley…

Ensure proper aseptic technique is used during insertion
Indwelling Urinary Catheter Insertion
(Manojlovich et al. Infect Control Hosp Epidemiol. 2015)

• Prospectively observed 81 catheter insertions in a level 1 trauma center emergency department

59% of the attempts had at least 1 major break in aseptic insertion technique

• Examples of major breaks of sterility:
  – Touching items on sterile field with bare hands
  – Catheter tip touching something before insertion
Use Aseptic Technique for Catheter Insertion

- NEJM Videos in Clinical Medicine:
  - Male Urethral Catheterization
    *T. W. Thomsen and G. S. Setnik* - 25 May, 2006
  - Female Urethral Catheterization

- Goal is to avoid contamination of the sterile catheter during the insertion process
Disrupting the Lifecycle of the Urinary Catheter

1. Preventing Unnecessary and Improper Placement
2. Maintaining Awareness & Proper Care of Catheters
3. Prompting Catheter Removal
4. Preventing Catheter Replacement

(Meddings. Clin Infect Dis 2011)
Proper Maintenance

• Keep the urinary system closed; use a pre-sealed junction

• Make sure flow is unobstructed:
  – No kinking, coiling, or looping
  – Drainage bag should be lower than the bladder
  – Regularly empty the bag

• Use of securement device recommended by many
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(Meddings. Clin Infect Dis 2011)
Timely Removal of Indwelling Catheters

• More than 30 studies have evaluated urinary catheter reminders and stop-orders
  – Significant reduction in catheter-associated urinary tract infection (53%)
  – No evidence of harm (ie, re-insertion)
  – Will also address the non-infectious harms of the Foley

What about the ICU?
Just because a patient is in the ICU does NOT mean that the patient needs a Foley…

The Key Question is this:

Are hourly assessments of urine output required?
Trigger Point: ICU To Floor

- ICUs have very high urinary catheter use

- Utilization may be reduced hospital-wide if patients transferred out of the ICU are evaluated for catheter necessity at time of transfer

(Slide courtesy of M. Fakih)
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(Meddings. Clin Infect Dis 2011)
Discontinue urinary catheter when it no longer meets appropriateness criteria

- Patient voids within 6 hours and no symptoms
  - Observe
- Patient voids within 6 hours but has symptoms of abdominal fullness or discomfort
  - Bladder scan, if volume <300 ml, observe. Repeat postvoid bladder scan if symptoms persist and contact physician
- Patient unable to void within 6 hours
  - Bladder scan, if volume >300 ml, intermittent catheterization. Repeat postvoid bladder scan if symptoms persist and contact physician

*If concerns arise during any part of the above assessment, please contact the physician*

(Prepared by Mohamad Fakih, MD, MPH - St. John Hospital & Medical Center, Detroit, MI)
“The Bladder Bundle”

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(Meddings. Clin Infect Dis 2011)
A Program to Prevent Catheter-Associated Urinary Tract Infection in Acute Care

Sanjay Saint, MD, MPH; M. Todd Greene, PhD, MPH; Sarah L. Krein, PhD, RN; Mary A.M. Rogers, PhD; David Ratz, MS; Karen E. Fowler, MPH; Barbara S. Edson, RN, MBA, MHA; Sam R. Watson, MSA, CPPS; Barbara Meyer-Lucas, MD, MHSA; Marie Masuga, RN, MSN; Kelly Faulkner, MSPA; Carolyn V. Gould, MD, MSCR; James Battles, PhD; and Mohamad G. Fakih, MD, MPH
Preventing CAUTI in Acute Care

• Federally-funded national program

• Total of 603 hospitals (926 units) in 32 states, DC, & Puerto Rico

• ~60% non-ICU; ~40% ICU

• Non-ICUs: CAUTI reduced by 32% (& decrease in catheter use)

• ICUs: no change in CAUTI or catheter use
The key intervention was having the bedside nurse assess daily for catheter necessity.
Preventing Infection

- Technical
- Socio-adaptive
Outline

• CAUTI: Background
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Start with a Plan

Step 1: Form a multidisciplinary CAUTI prevention team
### Key Roles and Responsibilities to Prevent CAUTI

<table>
<thead>
<tr>
<th>Role or Responsibility</th>
<th>Example of Personnel to Consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project coordinator</td>
<td>IP, quality manager, nurse manager, nurse educator</td>
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<tr>
<td>Nurse champion (engage nursing personnel)</td>
<td>Bedside nurse, nurse educator, unit manager, charge nurse</td>
</tr>
<tr>
<td>Physician champion (engage medical personnel)</td>
<td>ID physician, hospitalist, hospital epidemiologist, urologist, ED doc</td>
</tr>
<tr>
<td>Data collection, monitoring, reporting</td>
<td>Infection preventionist, quality manager, utilization manager</td>
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</tbody>
</table>

(Modified from www.catheterout.org)
The 6 Steps to Success

✓ Form a multidisciplinary CAUTI prevention team

2) Develop/modify a CAUTI policy for your institution

3) Pick an appropriate unit to start or go hospital-wide

4) Track performance and then escalate as necessary

5) Once successful, spread to other places

6) Consider sustainability at the outset; hard-wiring is worth the effort
The 6 Steps to Success

1. Form a multidisciplinary CAUTI prevention team
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5. Once successful, spread to other places
6. Consider sustainability at the outset; hard-wiring is worth the effort
Introducing the No Preventable Harms campaign: Creating the safest health care system in the world, starting with catheter-associated urinary tract infection prevention

Sanjay Saint, MD, MPH\textsuperscript{a,b,c,*}, Karen E. Fowler, MPH\textsuperscript{a,b}, Kelley Sermak, MSHSA, RN\textsuperscript{d}, Elissa Gaies, MD, MPH\textsuperscript{a}, Molly Harrod, PhD\textsuperscript{a,b}, Penny Holland, MSN, RN\textsuperscript{c}, Suzanne F. Bradley MD\textsuperscript{a,c}, J. Brian Hancock, MD\textsuperscript{f}, Sarah L. Krien, PhD, RN\textsuperscript{a,b,c}

In 7 VA hospitals CAUTI rate decreased by 66% in non-ICUs: 2.4 to 0.8
Tier 1 Protocol: Standard Practices

- Assess daily the necessity of the indwelling catheter
- Encourage use of alternatives to indwelling catheter
- Use standard indwelling urinary catheter kit with pre-sealed junction
- Ensure proper aseptic insertion technique
- Follow maintenance and removal guideline for care and removal of the catheter
- Measure CAUTI rates monthly

When monitoring CAUTI rates, be aware of the denominator.

Proceed to Tier 2 if rates higher than goal.

Tier 2 Protocol: Enhanced Practices

- Assess and document competency of healthcare workers performing insertion
- Consider Root Cause Analysis or Focused Review of CAUTI or catheter use to identify improvement opportunities
- Measure monthly for 6 months; re-evaluate. If rate has dropped below indicated levels proceed back to Tier 1

Sources:
- HICPAC CDC Guidelines on CAUTI Prevention
- www.catheterout.org

(Saint et al. AJIC 2015)
What if a hospital needs further help in preventing CAUTI?
Self-Assessment Tool for Hospitals

CAUTI Guide to Patient Safety ("CAUTI GPS")

• A 1-page (10-item) trouble-shooting guide

• Help identify the key reasons why hospitals may not be successful in preventing CAUTI

• Once the barriers are identified, can then propose and implement solutions
CAUTI Guide to Patient Safety (GPS)

(Saint et al. AJIC 2014; Fletcher et al. AJIC 2016)

• On-line tool, recently validated

• Each question linked to troubleshooting tips

www.catheterout.org

http://catheterout.org/questions.html
CAUTI GUIDE TO PATIENT SAFETY (GPS)

Question 1:
Do you currently have a well-functioning team (or work group) focusing on CAUTI prevention?
- Yes  - No

Question 2:
Do you have a project manager with dedicated time to coordinate your CAUTI prevention activities?
- Yes  - No

Question 3:
Do you have an effective nurse champion for your CAUTI prevention activities?
- Yes  - No

Question 4:
Do bedside nurses assess, at least daily, whether their catheterized patients still need a urinary catheter?
- Yes  - No

Question 5:
Do bedside nurses take initiative to ensure the indwelling urinary catheter is removed when the catheter is no longer needed (e.g., by contacting the physician or removing the catheter per protocol)?
- Yes  - No

Question 6:
Do you have an effective physician champion for your CAUTI prevention activities?
- Yes  - No

Question 7:
Is senior leadership supportive of CAUTI prevention activities?
- Yes  - No

Question 8:
Do you currently collect CAUTI-related data (e.g., urinary catheter prevalence, urinary catheter appropriateness, and infection rates) in the unit(s) in which you are intervening?
- Yes  - No

Question 9:
Do you routinely feedback CAUTI-related data to frontline staff (e.g., urinary catheter prevalence, urinary catheter appropriateness, and infection rates)?
- Yes  - No

Question 10:
Have you experienced any of the following barriers?
A. Substantial nursing resistance
   - Yes  - No
B. Substantial physician resistance
   - Yes  - No
C. Patient and family requests for an indwelling urinary catheter
   - Yes  - No
D. Indwelling urinary catheters commonly being inserted in the emergency department without an appropriate indication
   - Yes  - No

Submit  Clear form
Question 6: Do you have an effective physician champion for your CAUTI prevention activities?

You indicated that you either do not have a physician champion or that the one you have is not effective. A successful CAUTI prevention initiative usually requires collaboration and coordination between nurses and physicians. A physician champion is needed to bring the program to the other physicians, to help engage them, and to be a part of problem-solving when there is resistance or another challenge from this group of healthcare providers. For more specifics, please follow this link.
Successful hospitals usually figure out how to engage physicians.
Engaging health care workers to prevent catheter-associated urinary tract infection and avert patient harm

Mohamad G. Fakih, MD, MPH a,b,*, Sarah L. Krien, PhD, RNc,d, Barbara Edson, RN, MBA, MHA e, Sam R. Watson, MSA, MT f, James B. Battles, PhD g, Sanjay Saint, MD, MPH c
Physicians…

- Play a significant role in shaping care in the hospital
- Tend to be fairly autonomous; may not be employed by the hospital
- Primarily interested in treating illness – typically not trained to focus on improving safety and preventing harm
- Likely unaware of safety efforts in the hospital; most have limited time to volunteer for supporting the safety agenda
- Change may not be readily embraced
How to Engage Physicians?
(James Reinertsen, IHI innovation Series White Paper, 2007)

1. Develop a common purpose (patient safety, efficiency)
2. View physicians as partners (not barriers)
3. Identify physician champions early
4. Standardize evidence-based processes
5. Provide support from leadership for the efforts of the physician champion
### CAUTI Physician Champion: Reasons for Them to Support the Champion (or Become One...)

<table>
<thead>
<tr>
<th>Infectious Disease Specialists</th>
<th>Urologists</th>
<th>Geriatricians</th>
</tr>
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<tbody>
<tr>
<td>• Reduce CAUTI</td>
<td>• Reduce trauma (mechanical complications):</td>
<td>• Many elderly are frail</td>
</tr>
<tr>
<td>• Reduce antibiotic use</td>
<td>1. Meatal and urethral injury</td>
<td>• Urinary catheters are placed more commonly in elderly inappropriately</td>
</tr>
<tr>
<td>• Reduce potential of increased resistance and <em>Clostridium difficile</em> disease</td>
<td>2. Hematuria</td>
<td>• Urinary catheters increase immobility and deconditioning</td>
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<tr>
<td><strong>Hospitalists</strong></td>
<td><strong>Geriatricians</strong></td>
<td></td>
</tr>
<tr>
<td>• Infectious and mechanical complications</td>
<td>• Many elderly are frail</td>
<td></td>
</tr>
<tr>
<td>• Potential catheter complications prolonging length of stay</td>
<td>• Urinary catheters are placed more commonly in elderly inappropriately</td>
<td></td>
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<tr>
<td>• Often salaried physicians with incentives based on hospital-based quality and efficiency</td>
<td>• Urinary catheters increase immobility and deconditioning</td>
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(Fakih et al. AJIC 2014)
<table>
<thead>
<tr>
<th>Rehabilitation Specialists</th>
<th>Surgeons</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The urinary catheter reduces mobility in patients: “one-point restraint”</td>
<td>• Surgical Care Improvement Project: Remove catheters by postop day 1 or 2</td>
</tr>
<tr>
<td>• Rapid recovery (improvement in ambulation) may be hampered by the catheter</td>
<td>• Inappropriate urinary catheter use may negatively affect the surgeon’s profile</td>
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<thead>
<tr>
<th>Intensivists</th>
<th>Emergency Medicine physicians</th>
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<tr>
<td>• Intensivists can support the evaluation of catheter need before transfer out of the ICU</td>
<td>• Up to half of the patients are admitted through the emergency department (ED)</td>
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(Fakih et al. AJIC 2014)
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Conclusions

• The Foley catheter is hazardous to your patient’s health causing both infectious & non-infectious harm

• Several practices decrease CAUTI but it will not be easy; avoiding the catheter should be prioritized

• Both technical and socio-adaptive issues should be considered at the outset

• But most importantly…
Preventing CAUTI is a Team Sport!
Thank you!
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