What’s Inside your CAUTI Prevention Toolkit?

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Objectives

1. Review the role of the indwelling urinary catheter in CAUTI pathogenesis.
2. Provide a structured approach to CAUTI prevention based on the CDC guidelines.
3. Identify gaps in the use of CAUTI prevention strategies.
4. Present a comprehensive approach and specific tools for CAUTI prevention.
5. Highlight the role of performance measurement in CAUTI prevention.
Case Presentation

- 78 yo male with Alzheimer’s dementia and incontinence
- CC: fall vs. pre-syncope
- ED Course: labs, cultures, Foley
- Hospital course: syncope w/u negative, hydration, PT recommends SNF
- HD 3 develops fever and delta MS

How Preventable is CAUTI?

- 17-69% of CAUTI are preventable with recommended infection control measures (Gould, 2010)

Translation:
- 380,000 infections
- 9,000 deaths
- Many antibiotic doses

CAUTI Standard of Care Has Evolved

1980 1990 2000 2010

CDC JBI NHS SHEA APIC NHSN* CDC IDSA

CDC= US Centers for Disease Control
JBI=Joanna Briggs Institute
NHS=UK National Health Service
SHEA=Society of Healthcare Epidemiologists of America
APIC=Association of Professionals in Infection Control
NHSN=CDC’s National Healthcare Safety Network (revised surveillance definition)
IDSA=Infectious Diseases Society of America
Evidence-Based Guidelines

- SHEA-IDSA Compendium of Strategies to Prevent HAIs in Acute Care Hospitals, 10/08
  - [www.shea-online.org/about/compendium.cfm](http://www.shea-online.org/about/compendium.cfm)
- APIC Guide to the Elimination of CAUTIs, 12/08
  - [www.apic.org/CAUTIguide](http://www.apic.org/CAUTIguide)
- IDSA Diagnosis, Prevention, &Treatment of CAUTI in Adults: 2009 International Clinical Practice Guideline, 2/10
  - [http://www.idsociety.org/content.aspx?id=4430#uti](http://www.idsociety.org/content.aspx?id=4430#uti)
- CDC Guideline for Prevention of CAUTI, 10/10
  - [http://www.cdc.gov/hicpac/cauti/001_cauti.html](http://www.cdc.gov/hicpac/cauti/001_cauti.html)

Have you looked in your toolkit lately?

In light of these rapid changes in the field, the review of practices, policies, procedures, and product use is imperative for all healthcare facilities.

The Indwelling Urinary Catheter (IUC)

Associated with 84% of nosocomial UTIs

**DURATION** = biggest modifiable UTI risk factor

(Wald, Med Care 2005)
Pathogenesis of CAUTI


The Biofilm (“Slime Layer”)

Characterizing IUC Use In Hospitals

- Widespread
- Inappropriate
- Forgotten
- Invisible
- Unstandardized
Organizing The Approach To CAUTI Prevention:

Insertion → Care → Removal

- Avoidance and alternatives
- Evidence-based care practices & product selection
- Minimize duration
- Training, documentation, and surveillance

Strategy 1: Avoidance and Alternatives

- Few true medical indications for catheters
- Many alternatives to catheters
- Bladder scanner use to assist with suspected retention

(Fromrinickson, Orth Nurs. 2000.)

When are catheters indicated?

<table>
<thead>
<tr>
<th>Drainage</th>
<th>Relieve acute urinary tract obstruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring</td>
<td>Alteration in the blood pressure or volume status (unstable patient) requiring urine volume measurement</td>
</tr>
<tr>
<td>Peri-procedure</td>
<td>For selected surgical procedures, Patients requiring prolonged immobilization</td>
</tr>
<tr>
<td>Therapy</td>
<td>Assist in healing of open sacral or perineal wounds for incontinent patients, Patient comfort at the end of life or on request</td>
</tr>
</tbody>
</table>
When are catheters indicated perioperatively?

| Drainage                      | • Anticipated prolonged duration of surgery (>2-3 hrs)*
|                              | • Anticipated large volume infusions or diuretics during surgery (> 1500-2000 mL) |
| Monitoring                   | • Need for intra/postoperative monitoring of urinary output |
| Peri-procedure               | • Urologic or other surgery on contiguous structures of the GU tract
|                              | • Deflation of bladder for laparoscopic procedure* |
| Therapy                      | • Prolonged effect of epidural anesthesia
|                              | • Operative patients with urinary incontinence |

*May be removed at the end of the case

So you’ve avoided the catheter…

...have you provided alternatives for managing urine output?

- Condom catheter  
  (Saint, Arch Intern Med. 1999)
- Intermittent straight catheter  
  (with bladder scanner)  
  (Johansson, J Clin Nurs. 2002; Saint, JAGS 2006; Saint, B Commis (Qual Patient Saf. 2009))
- Incontinence pads  
  (Jenkins & Sokolof, Nursing 2009; Padula, JWOCN 2008)
- Commode/urinal  
  (Gray, AACN Advanced Critical Care 2010)
- Voiding program  
  (Gray, AACN Advanced Critical Care 2010)
Strategy 2: Evidence-based care practices and products

- Insertion and care practices can be standardized and monitored
- Approach must be multidisciplinary
- Antimicrobial products do not substitute for a comprehensive CAUTI prevention program.

What catheter to insert?

- Insufficient evidence to recommend any standard material above others
  - Latex
  - Silicone-coated latex
  - Hydrogel-coated latex
  - Silicone
- Antimicrobial catheters (silver and antibiotic impregnated)
  - Reduce asymptomatic bacteriuria
  - Inconclusive effect on symptomatic CAUTIs

Evidence-based Insertion Practices

- Practice hand hygiene
- Ensure properly trained personnel
- Use aseptic technique and sterile equipment
- Choose as small a catheter as possible
Evidence-based Maintenance Practices
- Secure catheter
- Routine perineal hygiene
- Sterile, continuously closed system
- Maintain unobstructed flow
- Empty urinary drainage bag

Strategy 3: Minimize Duration
- Many catheter-days not due to medical necessity
- Catheter-days often a function of patient and provider factors
- Employ systems solutions to minimize duration

Evidence-based IUC Removal Strategies
- Stop orders (Meddings, CID, 2010)
- Education and performance feedback (Goetz, Am J Infect Control, 1999)
Strategy 4: Supportive Strategies

- Catheters are poorly, inconsistently documented
- Training is overlooked
- Nursing policies and procedures drive much catheter care
- Surveillance is increasingly required and central to QI

There is room for improvement

National sample of US non-VA hospitals IC practitioners

<table>
<thead>
<tr>
<th>Strategy</th>
<th>2005</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of condom caths</td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>Use of bladder ultrasound</td>
<td>29%</td>
<td>39%</td>
</tr>
<tr>
<td>Reminder or stop-order</td>
<td>5%</td>
<td>20%</td>
</tr>
<tr>
<td>Antimicrobial catheters</td>
<td>30%</td>
<td>45%</td>
</tr>
</tbody>
</table>

Saint et al (JGIM online 12/6/11)

The STOP CAUTI Study

medschool.ucdenver.edu/stopcauti

www.nicheprogram.org
STOP CAUTI study goals

- To develop and disseminate a method for electronic surveillance of urinary catheter duration and CAUTIs
- To determine the effect of the feedback of these data on processes of care (catheter duration) and outcomes (CAUTIs)
- To build QI research capacity in aging

STOP CAUTI Current Practice Survey
(Fink et al. AJIC online Feb 2012)

- Describe CAUTI prevention activities in NICHE hospitals
- Baseline Data Collection for the STOP CAUTI Workgroup Study
- Online survey to all 250 NICHE coordinators in early 2010

Characteristics of Hospitals Responding to Survey

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Response (N=75)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed Size (mean # beds, range)</td>
<td>395 (23-1135)</td>
</tr>
<tr>
<td>Urban Setting (%)</td>
<td>84%</td>
</tr>
<tr>
<td>Teaching Hospital (%)</td>
<td>69%</td>
</tr>
<tr>
<td>Magnet Status (%)</td>
<td>31%</td>
</tr>
<tr>
<td>STOP CAUTI Participant (%)</td>
<td>27%</td>
</tr>
<tr>
<td>HAI Mandatory Reporting State (%)</td>
<td>61%</td>
</tr>
</tbody>
</table>
How often are these alternatives or adjuncts to indwelling catheters used at your hospital?

- Always
- Frequently
- Sometimes
- Never

(N=75) Fink et al (AJIC in press) Sample of NICHE hospitals

How often does access to the following equipment limit its use at your hospital?

- Always
- Frequently
- Sometimes
- Never

*Access to female urinals limited usage* (N=75) Fink et al (AJIC in press)

Who is responsible for insertion of indwelling urinary catheters?

- RN
- LPN
- RN student
- PCA
- Attending
- Resident
- NP/CNS
- Med Student

(N=75)
In which populations does your hospital use the following indwelling catheter types?

- **Hospital Wide**
- **Selected Units**
- **Selected Patients**
- **None**

![Bar chart showing distribution of catheter types](chart)

<table>
<thead>
<tr>
<th>Catheter Type</th>
<th>N=75</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Wide</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Selected Units</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>Selected Patients</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>None</td>
<td>25%</td>
<td>25%</td>
</tr>
</tbody>
</table>

Does your hospital have a system to remind providers to remove indwelling catheters?

- Nurse driven protocol to discontinue (40%)
- Paper reminders (36%)
- Electronic reminders (37%)
- Nurse led catheter rounds (35%)
- Other
  - Stickers on MD orders and medical records
  - ICUs have prompt on daily goal sheet
  - Electronic Stop Orders

![Circle chart showing system types](chart)

<table>
<thead>
<tr>
<th>System Type</th>
<th>N=75</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse driven protocol</td>
<td>44%</td>
<td>44%</td>
</tr>
<tr>
<td>Paper reminders</td>
<td>36%</td>
<td>36%</td>
</tr>
<tr>
<td>Electronic reminders</td>
<td>37%</td>
<td>37%</td>
</tr>
<tr>
<td>Nurse led catheter rounds</td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>Other</td>
<td>15%</td>
<td>15%</td>
</tr>
</tbody>
</table>

How is urinary output and catheter care management documented on your primary unit?

<table>
<thead>
<tr>
<th>Document Type</th>
<th>N=75</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic</td>
<td>43%</td>
<td>43%</td>
</tr>
<tr>
<td>Standardized Paper</td>
<td>24%</td>
<td>24%</td>
</tr>
<tr>
<td>Narrative Paper</td>
<td>24%</td>
<td>24%</td>
</tr>
</tbody>
</table>
Which of the following aspects of urinary output and catheter care management are routinely documented on your primary unit?

- Type and size
- Date of insertion
- Insertion location
- Insertion description
- Infection surveillance
- Catheter care
- Infection rate
- Infection rate trend

N=75

Initial Training and Annual Validation

Annual validation on aseptic technique occurs at ~47% of hospitals

Do your infection preventionists perform routine surveillance for CAUTIs?

- Where is surveillance conducted?
  - House-wide (64%)
  - ICU only (13%)
  - Did not answer or did not know (13%)
  - NA (9%)
- Catheter days are collected
  - All units (51%)
  - Selected units (35%)
  - Not done (14%)

N=75
Does your hospital have a policy/procedure on indwelling urinary catheter placement, management, and/or prevention of CAUTI?

Among a subset of policies reviewed:
- 40% were > 2 years old
- 25% used Lippincott or Delmar’s texts
- Evidence-based
  - Ranged - 1994-2009

Policy and Procedure Components
- Appropriate catheter indication (50%)
- CAUTI S&S assessment parameters (20%)
- Bladder scanner parameters (20%)
- Insertion technique parameters were discussed but varied by hospital
- Sterile closed system reinforced (70%)
- Urine specimen procedure outlined (65%)
- Lack of discussion
  - Emptying urinary bag (50%)
  - Meatal care frequency and agent used (50%)

Summary of CPS Results
- NICHE hospitals are implementing many evidence-based CAUTI strategies
  - Evidence-based insertion and maintenance
  - CAUTI education
  - CAUTI QI projects
- NICHE hospitals can improve upon
  - Use of stop orders and reminders
  - Use of alternatives to IUCs
  - Documentation and surveillance
How to Close the Gaps in CAUTI Prevention Activities

- Select your approach
- Select your tools

University of Colorado Hospital Comprehensive Approach (modified)

1. Assemble a multidisciplinary team
2. Follow the evidence
3. Break it down into smaller projects
4. Complete a formal product review
5. Enhance skills and knowledge
6. Make it easy to do the right thing
7. Measure outcomes

(Oman et al AJIC online November 2011)

Following the Evidence

- Comprehensive revision of policy and procedures
- Based on literature review
- Structured rollout hospital-wide
Formal product review

- Catheter alternatives
  - Commodes
  - Bedpans
- Catheter
  - Material selection
  - Securement devices
  - Complete kits

Enhance skills and knowledge

- Nurses and CNAs
  - Catheter insertion and care covered for all new hires and annual skills labs
  - Unit-based journal clubs
  - Factoid reminder posters
  - TRIP cards
- Target ancillary staff
- Patient and family

TRIP Sheet: Foley Catheter Removal
Translating Research Into Practice
UCH CA-UTI Team

What does the evidence say?
- If the Foley catheter has been in place for at least 2 days start providing daily reminders for the physician to evaluate continued need for the device.
- Indications for Foley use past the 2 day cutoff:
  - Unresolved urinary retention
  - Unresolvable urinary incontinence
  - Critical patient care
  - Renal insufficiency
  - Comfort care for the terminally ill
  - To promote healing on an area of skin breakdown
  - For the management of neurogenic bladder

Change in practice?
- The patient and family members should also be reminded of the benefits of removing the catheter.
- Use patient education flier
- Order a bedside commode for patients who have difficulty ambulating to the bathroom.

Selected References:
Lo et al. (2008). Strategies to prevent catheter-associated urinary tract infections in acute care hospitals. *Infection Control and Hospital Epidemiology*, 29(S1), S41-S50.
Make it easy to do the right thing

- Insertion or removal decision aid
- Standardized EMR documentation
- Stop orders
- Nurse-driven protocols
- Catheter rounds
- Electronic reminders

Decision Aids

From: University of Colorado Hospital
Oman et. al. AJIC online November, 2011

Documentation of Urinary Catheters:
Ideal Data Element Set (STOP CAUTI)

1. Catheter insertion date and time
2. Indication for insertion (urinary retention, etc.)
3. Insertion Location (ED, OR, unit, etc.)
4. Type of catheterization (new, present on admission, reinsertion, etc.)
5. Catheter removal date and time

Optional/alternative data elements:
1. Daily assessment (present, patent, draining, removed, etc.)
2. Daily assessment of ongoing need or daily notation of indication
3. Other catheter (in/out or straight, Texas or condom)
4. Bladder scanner use and result
Sample Stop Order


Nurse-Driven Protocol

Indications for IUCs
- Fluidity
- Palliative
- Incontinence w/ Stage III/IV pressure ulcer
- Urinary retention unresolved
- Actively titrating diuretics and/or fluids
- Chronic indwelling
- Specific orders for operative procedures

If patient does not meet criteria, 24 hours after admission/insertion:
- Write a nursing order to remove IUC in early AM when totaling night shift output
- Document removal and time

Encourage PO fluid intake
Encourage ambulation to toilet
Monitor for first void and output
If unable to void after 6-8 hours, perform bladder scan; notify MD

Consider your measurement strategy

Not everything that counts can be measured. Not everything that can be measured counts.
Target process measurement to goals

- Describing catheter utilization
  - Catheter-days/unit
  - Catheter-days/patient
  - Catheter duration <= threshold
    - SCIP-9: Postoperative urinary catheter removal on post-operative day 1 or 2
  - ED or OR catheter insertion rates
  - Days of appropriate utilization/total days

ED Insertion Rates

Consider additional measures of catheter use and care

- Appropriate insertion practice “bundle”
  - Indication documented
  - Hand Hygiene performed
  - Sterile equipment and aseptic technique
  - Trained personnel performing insertion
  - Catheter secured after insertion

- Appropriate daily care “bundle”
  - Trigger tool daily or daily indication
  - Maintain closed system
  - Empty bag and access samples aseptically
  - Hand hygiene and standard precautions for manipulation
  - Routine perineal hygiene (no antiseptics)
  - Bag below level of bladder
  - Tubing unknked
Can you justify the expense of a bladder scanner?

- Bladder scanner use log
- Ex: 50 uses/2 months
  - Post IUC check most common reason
  - Avoided reinsertion in all but 2 instances

What’s inside your CAUTI prevention toolkit?

“If you only have a hammer, you tend to see every problem as a nail.”

Abraham Maslow

STOP CAUTI Funding

- Demonstration and Dissemination Grant (R18), Agency for Healthcare Research and Quality (AHRQ), U.S. Department of Health and Human Services (http://www.ahrq.gov)

- Paul B. Beeson Career Development Award in Aging (K23), National Institute on Aging, U.S. National Institutes of Health (http://www.nia.nih.gov)
The STOP CAUTI Project Team

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- Andy Kramer, MD, Co-Investigator

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