A Multi-disciplinary Approach to Preventing Catheter-associated Urinary Tract Infections (CAUTI)

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Case Presentation

- 78 yo male with Alzheimer’s dementia and incontinence
- CC: falls
- ED Course: labs, cultures, Foley
- Hospital course: Hydration, PT evaluation recommends SNF
- HD 3 develops fever and delta MS,
  + UA and culture
Question 1
Who will be held accountable for the CAUTI?

- The RN in the ED who inserted the catheter
- The attending Hospitalist
- The hospital
- The infection control practitioner

CAUTI: No longer under the radar

HAI’s are a priority for:

- Congress
- State Governments
- CMS
- HHS Agencies (CDC/AHRQ/NIH)
- Leapfrog
- Patients
- IHI
- Professional societies
- Hospitals

…and you!
Federal Regulations Concerning CAUTI

Current:
- Hospital-acquired conditions (HACs) policy
- SCIP-9: catheter removal postop day 1 or 2
- State reporting (>1/2 of states)
- HHS HAI Action Plan

Future?
- Hospital Compare
- Value-based purchasing
- Enhanced HACs policy

CAUTI standard of care is evolving

<table>
<thead>
<tr>
<th>1980</th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDC</td>
<td>JBI</td>
<td>NHS</td>
<td>SHEA</td>
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<td>APIC</td>
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<td>NHSN</td>
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<td>CDC</td>
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<td></td>
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<td>IDSA</td>
</tr>
</tbody>
</table>

Evidence-Based Guidelines

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

What is the role of the Foley catheter in the pathogenesis of CAUTI?

1. A surface for biofilm formation
2. Associated with 50% of hospital-acquired UTIs
3. Only long-term catheters are worrisome for infection

CAUTI epidemiology

- Most common HAI (40%)
- 500,000+ cases annually (CDC)
- $676/case, $424-$452 million/year
- 5% complicated by bacteremia


Defining Healthcare-associated CAUTI

- UTI
  - Culture positive* AND EITHER
  - Symptoms*
  - Positive blood culture
  - Indwelling catheter in place (or within 48 hrs)
  (Must be in the location at least 48 hrs when infection develops)
The indwelling urinary (Foley) catheter

**Pathogenesis of CAUTI**

- **Extraluminal**
  - Bacteria on surface
  - Vapour by suprazym action

- **Intraluminal**
  - Bacteria in closed drainage
  - Contamination of collection bag


The tragedy of urinary catheter use in hospitals

- Widespread
  - 40% of Medicare beneficiaries (MPSMS)
- Inappropriate
  - 50% of ED use and up to 50% of catheter days
- Forgotten
  - 25% of teaching attendings know who has a catheter (Saint)
- Invisible
  - 23% of hospitals monitor catheter use (Saint, CID, 2008)
Understanding Catheter Use

- **Insertion**
  - Avoidance
- **Care**
  - Evidence based technique
  - Product selection
- **Removal**
  - Minimize duration

**Question 3**
A catheter is indicated for:
1. Fall risk
2. Risk of skin breakdown
3. To obtain a urine culture
4. Bladder outlet obstruction

**1. Avoidance**
- Use only when indicated
- Consider alternatives to catheterization
- Use bladder scanners to manage patients with suspected urinary retention (e.g. postoperative)

(Fredrickson 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></td>
<td>Accurate I/O in the critically ill</td>
</tr>
<tr>
<td>Peri-procedure</td>
<td>For selected surgical procedure</td>
</tr>
<tr>
<td>Therapy</td>
<td>Assist in healing of open sacral or perineal wounds for incontinent patients</td>
</tr>
<tr>
<td></td>
<td>Patient comfort at the end of life or on request</td>
</tr>
</tbody>
</table>

Which selected surgical procedures?

<table>
<thead>
<tr>
<th>Drainage</th>
<th>Anticipated prolonged duration of surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring</td>
<td>Need for intraoperative monitoring of urinary output</td>
</tr>
<tr>
<td>Peri-procedure</td>
<td>Urologic or other surgery on contiguous structures of the GU tract</td>
</tr>
<tr>
<td>Therapy</td>
<td>Prolonged effect of epidural anesthesia</td>
</tr>
<tr>
<td></td>
<td>Operative patients with urinary incontinence</td>
</tr>
</tbody>
</table>

Indwelling catheters should not be used:

- For routine care for the patient with incontinence
- As a means to obtain urine culture or other diagnostic tests in a patient who can void
- For prolonged postoperative duration without appropriate indications
- Routinely for patients receiving epidural anesthesia/analgesia
Question 4

What strategies can be used to prevent CAUTI?
1. Condom catheters
2. Aseptic technique
3. Vigorous meatal cleansing
4. Stop orders and reminders

Alternatives to indwelling catheters
- Condom catheter (Saint. Arch Intern Med. 1999)
- Intermittent catheterization (Johansson, J Clin Nurs. 2002)
- Suprapubic catheters
- Incontinence pads
- Commode/urinal
- Medications
- Voiding program
- Environmental changes

2. Evidence-based…
technique for catheter insertion
- Practice hand hygiene
- Insure properly trained personnel perform insertions
- Use aseptic technique and sterile equipment
  - gloves, a drape, sponges, sterile or antiseptic solution for cleaning meatus
  - single-use packet of sterile lubricant jelly
- Use as small a catheter as possible
… management of indwelling catheters

- Sterile, continuously closed system
- Do not disconnect except for irrigation
- Replace with aseptic technique
- Unobstructed flow; below bladder
- Empty regularly
- Routine perineal hygiene
- Sampling aseptically
- Secure catheter

…and selection of catheter materials

- Demonstrated to reduce asymptomatic bacteriuria
- No consensus has emerged
- Consider use of antimicrobial catheters if rates of CAUTI remain high despite other interventions

Srinivasan. IHIE. 2006.

3. Removal

- Stop orders
- Education and performance feedback
- Guidelines and algorithms for use
**Additional recommendations**

- Provisions of guidelines
- Education and training
- Documentation standards
- Surveillance

**CAUTI: Underuse of evidence-based prevention strategies**

Among non-VA hospitals:
- 29% use portable bladder ultrasound
- 9% use catheter reminder or stop order
- 30% use antimicrobial catheters
- 12% use condom catheters in men
- 9% use suprapubic catheters


**Example: Multicomponent intervention**

- Pre-post study of orthopedic surgery patients
- Intervention:
  1. Catheter Use Guidelines
  2. Educational sessions
  3. Posters in all locations
  4. Feedback at 6 months

Results

- 82% guideline adherence
- 60% reduction in UTI incidence density (ratio 0.41 95% CI 0.2-0.79)

<table>
<thead>
<tr>
<th>Time Period</th>
<th>UTIs/1000 catheter-days</th>
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<tbody>
<tr>
<td>Pre-intervention</td>
<td>10.4</td>
</tr>
<tr>
<td>Post-intervention</td>
<td>3.9</td>
</tr>
<tr>
<td>2 y post-intervention</td>
<td>3.7</td>
</tr>
</tbody>
</table>

- Reduction in antibiotic use
  - 48% reduction in doses for UTIs
  - 11% reduction in doses for any indication

Create a multidisciplinary team

- Physicians: ID, Hospitalist, ED, surgery
- Nursing: educators, med-surg, ED, OR
- Infection control
- IT and/or QI

Question 5

How can I carry out a multicomponent intervention at my institution?
1. Recruit a multidisciplinary team
2. Follow the evidence
3. Break it into manageable pieces
4. Pay attention to products
5. Measure outcomes
6. All of the above
Follow the evidence

- Review the literature
- Update your policy and procedures

Break it down

- Tackle one approach at a time
  - Decision to insert (largely ED and OR)
  - Evidence-based insertion (hospital-wide) and maintenance (inpatient units)
  - Removal (inpatient units)

Consider the products

- Foley materials and size; kits
- Securement device
- Urinals
- Commodes
- Bladder scanners
Measure what you are doing!

- Work with Infection Control and/or Clinical Informatics
- Potential outcomes:
  - CAUTIs/1000 catheter days
  - Catheter days/hospital days
  - (postoperative) catheter days/patient
  - Proportion of catheterized/admitted patients from ED or OR

Project Targeting insertion and care

- Hospital-wide strategies
  - Policy update with online module
  - Standardized catheter products
  - ED and OR insertion competency training
  - Targeted education to Transport and Radiology staff

Project - continued

- Intensive intervention
  - Unit-based journal club
  - Bladder scanner purchase
  - Increased bed-side commode availability
  - Factoid reminder posters
  - TRIP cards
  - Patient/family educational materials
Did you know…

- Using a Foley to prevent a patient from falling when trying to go to the bathroom is not proven.
- Instead, try these alternatives:
  - Condom catheter
  - Incontinence Pads
  - Bedside commode
  - Urinal

TRIP Sheet: Foley Catheter Removal
Translating Research Into Practice

**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 Foley.
- Indications for Foley use past the 2-day cutoff:
  - Unresolved urinary retention
  - Urinary tract obstruction
  - Urge incontinence
  - Renal insufficiency
  - Urinary tract infection
  - To promote healing on an area of skin breakdown
  - For the management of neurogenic bladder

**Change in practice?**
- The patient and family members should be 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:

CAUTIs on General Surgery (9th fl)
Mean Changes in Catheter Days

Number of Units at UCH with any CAUTI

Project – Avoidance

Targeted OR and ED
- Focus groups
- Develop decision aids
- Deliver intervention
**Decision Aid**

Is there a need for an intruding urinary catheter?

<table>
<thead>
<tr>
<th>Option</th>
<th>Consideration</th>
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<tbody>
<tr>
<td>Informed consent before placement</td>
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<tr>
<td>Avoid if possible</td>
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<tr>
<td>Use only for short-term purposes</td>
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<tr>
<td>Provide for patient comfort</td>
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**ED Implementation – May 2010**

- Brief presentations to RNs and MDs
- Distribution of laminated cards to RNs
- Factoid posters
- Healthstream module to RNs
- Product changes: incontinence pads, bariatric commodes, Texas catheters
- Recommendations to ED design group
- Goal: incorporation of appropriateness criteria into electronic charting

**ED – Insertion Avoidance Results**

Proportion of admitted patients with Foley catheters:

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</thead>
<tbody>
<tr>
<td>ED (Ibex)</td>
<td>9.4%</td>
<td>8.8%</td>
<td>8.8%</td>
<td>8.7%</td>
<td>9.9%</td>
<td>8.7%</td>
<td>6.8%</td>
<td>5.9%</td>
</tr>
</tbody>
</table>
Questions?

- Thank you for your attention!