Catheter-Associated Urinary Tract Infection Prevention

Last updated 2018

Basics of Infection Prevention
Healthcare-Associated Infections Program
Center for Health Care Quality
California Department of Public Health
Objectives

• Define the scope of healthcare-associated urinary tract infections (UTI)
• Review evidence-based clinical practices shown to prevent catheter-associated urinary tract infections (CAUTI)
• Discuss strategies to reduce CAUTI within healthcare settings
• Discuss adherence monitoring and feedback
CAUTI Prevention – What works?

Best sources for evidence-based CAUTI prevention practice recommendations

• **CDC/HICPAC** CAUTI Prevention Guideline, 2009
• **SHEA/IDSA** Strategies to Prevent Catheter-Associated Urinary Tract Infections in Acute Care Hospitals, 2014
UTI in Hospitals

- 80% UTI are catheter-associated (CAUTI)
- Leading cause of secondary bloodstream infection (BSI)
- 10% mortality rate (13,000 attributable deaths annually)
- Increases length of stay by 2-4 days
- Results in antimicrobial overuse and antimicrobial resistance
Urinary Catheter Use

• Use of indwelling urinary catheters high
  • Medical surgical unit: 10-30% patients
  • ICU: 60-90% patients
  • Nursing home: 7-10% residents
• 40-50% patients with a urinary catheter in hospital non-ICU ward do not have a valid indication for placement
• Physicians frequently unaware of use

NHSN Patient Safety Manual, Chapter 7, UTI
CDC: Catheter Associated UTI, https://www.cdc.gov/hai/ca_uti/uti.html
Indwelling Catheter Duration

• Risk of CAUTI increases each day the urinary catheter remains

• Risk of bacteriuria with catheterization
  • Daily: 3% - 10%
  • By day 30: 100%

NHSN Patient Safety Manual, Chapter 7, UTI
CDC: Catheter Associated UTI, https://www.cdc.gov/hai/ca_uti/uti.html
CAUTI Etiology

• Source:
  • Patient’s colonic or perineal flora
  • Bacteria on hands of personnel

• Microbes enter bladder via one of two routes:
  • Extraluminal: the external surface
  • Intraluminal: inside the catheter

Common CAUTI Pathogens

• *Escherichia coli* 24%
• *Pseudomonas aeruginosa* 10%
• *Klebsiella pneumoniae/oxytoca* 10%
• *Enterococcus faecalis* 7%

NHSN Antimicrobial Resistance Report: Distribution of all Pathogens Reported by HAI Type, Appendix to Table 4, 2011-2014

CAUTI Prevention

- **69%** CAUTI can be prevented with currently recommended infection prevention practices
  - 380,000 infections prevented annually (~40,000
  - 9,000 lives saved

- National 2020 CAUTI 5-year prevention goal: **25% decrease** from 2015 baseline
  - CDPH HAI Advisory Committee recommended adoption of national goal for California hospitals
HAI Prevention Practice Terms

Core / Basic Care Practices

- **Standard of practice**
- Based on higher levels of scientific evidence
- Demonstrated feasibility
- **Effectiveness depends on consistency**

Special Approaches

- Used **in addition to Core/Basic** care practices when HAI rates remain high or during outbreaks
- Based on some scientific evidence
- May not be feasible in all settings
Core/Basic CAUTI Prevention Strategies

• Insert catheters only for appropriate indications
• Leave in place only as long as needed
• Ensure only properly trained persons insert and maintain
• Perform hand hygiene
• Use aseptic technique and sterile equipment for insertion
• Maintain closed drainage system and unobstructed urine flow
• Implement improvement program to achieve appropriate use of catheters
Appropriate Indications for Indwelling Ureteral Catheters

- Acute urinary retention or obstruction
- Need for accurate measurement of urinary output (ICU)
- Post operative use for selected (not all) surgical procedures
- Assist healing of perineal and sacral wounds in incontinent patients
- Prolonged immobilization due to unstable spine or pelvic fracture
- Hospice (end of life), comfort care, palliative care
Leave Indwelling Catheter in Place Only as Long as Needed

• Implement a process to assess daily the need for the indwelling urinary catheter
  • Physician reminders
  • Electronic medical record prompts
• Consider alternatives to indwelling urinary catheter
  • External catheters
  • Intermittent catheterization
Ensure Only Properly Trained Persons Insert and Maintain Indwelling Urinary Catheters

- Train HCP, family members, or the patient (if appropriate)
  - Correct technique of aseptic catheter insertion
  - Maintenance of the catheter
- Train HCP upon hire and at lease annually
- Make return demonstration part of the training to ensure competency
Perform Hand Hygiene

Perform hand hygiene:

- Immediately before and after catheter insertion
- Immediately before and after any catheter manipulation
  - Repositioning the catheter tubing or bag
  - Obtaining a specimen
Use Aseptic Technique and Sterile Equipment for Insertion of Indwelling Urinary Catheter

- Perform hand hygiene before and after procedure
- Ensure the following are used during insertion
  - Sterile gloves, drape, and sponges
  - Appropriate antiseptic or sterile solution for periurethral cleaning
  - A single use packet of lubricant jelly for insertion
Maintain Closed Drainage System and Unobstructed Urine Flow

A closed system prevents contamination and possible pathogens from entering the bladder

- Replace the catheter and collection system if breaks in aseptic technique during insertion, or disconnection, or leakage occurs
- Use urinary catheter systems with pre-connected, sealed catheter-tubing junctions
- Keep the catheter tubing below the bladder and free from kinking
CAUTI Prevention Bundle Examples

Insertion Bundle
• Verify need prior to insertion
• Insert urinary catheter using aseptic technique.
• Maintain urinary catheter based on recommended guidelines

Maintenance Bundle
• Daily assessment of catheter need documented
• Tamper evident seal is intact
• Catheter secured to patient
• Hand hygiene performed before patient contact
• Daily meatal hygiene with soap and water
• Drainage bag emptied using a clean container
• Unobstructed flow maintained

Not Recommended

**No evidence** to support UTI prevention

- Complex urinary drainage systems
- Routinely changing catheters or drainage bags
- Routine antimicrobial prophylaxis
- Cleaning the periurethral area with antiseptics
- Antimicrobial irrigation of the bladder
- Antiseptic / antimicrobial solution instillation into drainage bags
- Routine screening for asymptomatic bacteriuria
CAUTI Prevention Special Approaches

• Consider alternatives to indwelling urinary catheters
• Use portable ultrasound devices to assess urinary retention, reduce unnecessary catheterizations
• Consider antimicrobial/antiseptic impregnated catheters

Special Approaches will not be effective unless core/basic care practices are used routinely
UTI Prevention Process Measures

Measure catheter use:

• Days with Foley catheter ÷ Patient days (x 100) = __%

Measure health care provider adherence:

• Hand hygiene
• Documentation of catheter insertion and removal
• Daily assessment of indwelling urinary catheter
• Documentation of indications for use
UTI Prevention Outcome Measure

Measure infections:

- Perform UTI surveillance using standardized definitions and protocols
- Bacteria in urine alone is not an infection
  - Must evaluate for other UTI symptoms or have supporting laboratory data

NHSN Patient Safety Module: Chapter 7 Device-Associated Module, CAUTI
## Adherence Monitoring Tool - UTI Prevention

### CAUTI Prevention Opportunity

<table>
<thead>
<tr>
<th>CAUTI Prevention Opportunity</th>
<th>Patient/Resident 1</th>
<th>Patient/Resident 2</th>
<th>Adherence by Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal between catheter and collecting tubing is intact.</td>
<td>Yes No</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>Catheter tubing unobstructed - not twisted, kinked, or looped.</td>
<td>Yes No</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>Documentation of indwelling catheter necessity – and it is appropriate.</td>
<td>Yes No</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>The urine collection bag is below the level of the bladder.</td>
<td>Yes No</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>The catheter is secured to the patient/resident.</td>
<td>Yes No</td>
<td>Yes No</td>
<td></td>
</tr>
</tbody>
</table>

#Yes____ #Observed____ #Yes/ # Observed = % Adherence ______%

CDPH Adherence Monitoring tools: cdph.ca.gov/hai
Hospital Role in CAUTI Prevention

- Ensure policies and practice reflect current evidence based recommendations
  - CDC guidelines
- Ensure staff competency upon hire and at least annually
  - New hire orientation
  - Annual skills fair
  - Return demonstration to ensure competency
- Establish an adherence monitoring program for core care practices
  - Use tools to measure adherence
- Perform UTI surveillance
- Provide feedback to frontline staff and leaders
  - Present adherence results with CAUTI incidence to each unit
CDPH CAUTI Observations, 131 Facilities, 2016

- Seal intact: 39%
- Tubing unobstructed: 60%
- Necessity documented: 95%
- Urine collection bag below bladder: 98%
- Cath secured to resident: 62%
Preventing CAUTI: The MOST Important Things

Prevent Catheter Associated UTI - Avoid Antibiotics

- Insert catheters only for appropriate indications
- Leave in place only as long as needed
- Ensure only properly trained persons insert and maintain
- Perform hand hygiene
- Use aseptic technique and sterile equipment for insertion
- Maintain closed drainage system and unobstructed urine flow
- Implement improvement program to achieve appropriate use of catheters
Additional CAUTI Prevention References and Resources


• IHI Program to Prevent CAUTI http://www.ihi.org/topics/CAUTI/Pages/default.aspx

Questions?

For more information, please contact any HAI Liaison IP Team member

Or email

HAIProgram@cdph.ca.gov