

Best Practices for Eliminating Catheter-Associated Urinary Tract Infections – Beyond the CDC Guidelines
Presented by Robert Garcia, BS, MT(ASCP), CIC
Teleclass sponsored by Sage Products Inc. (www.sageproducts.com)

Best Practices for Eliminating Catheter-Associated UTI:
BEYOND THE CDC GUIDELINES

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 Infection Control Preventionist, New York

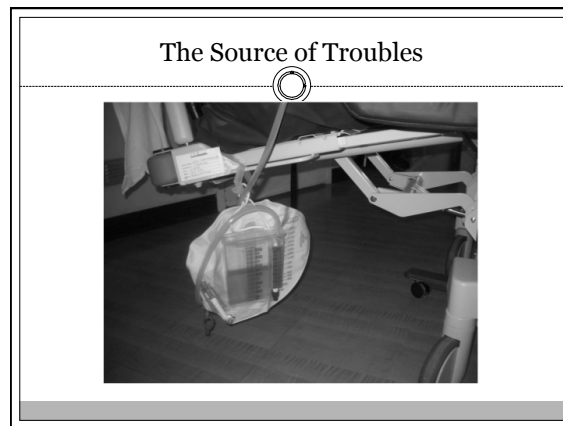
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Today's Objectives

- Describe the prevalence and extent of CAUTI events in the United States
- Review Regulatory and quality initiatives associated with the prevention of CAUTI
- Review preventive recommendations as outlines from national quality organizations
- Describe a novel intervention which may affect the occurrence of CAUTIs



Epidemiology

- 4 million Americans per year undergo urinary catheterization¹
- >500,000 remain indwelling for some time¹
- About 25% of patients in hospitals² and 4.5 % of LTC patients³ will be managed by an indwelling catheter
- CAUTI occurs at a rate of 3% to 10% per day⁴
- Incidence approaches 100% within 30 days.⁵
- Approx. 25% of hospital inpatients will have a urinary catheter at some time

1. Doyle B. Decreasing nosocomial urinary tract infection in a large academic community hospital. Lippincotts Case Manag 2001;6:127-136.
 2. Saini S. The potential clinical and economic benefits of silver alloy urinary catheters in preventing urinary tract infection. Arch Intern Med 2000;160:2670-75.
 3. Junkin J. Prevalence of incontinence and associated skin injury in the acute care inpatient. J Wound Ostomy Continence Nurs 2007;34:260-69.
 4. Trantner BW. Prevention of catheter-associated urinary tract infection. Curr Opin Infect Dis 2005;18:37-41.
 5. Warren JW. A prospective microbiologic study of bacteruria in patients with chronic indwelling urinary catheters. J Infect Dis 1982;146:719-23.

Cost of CAUTI

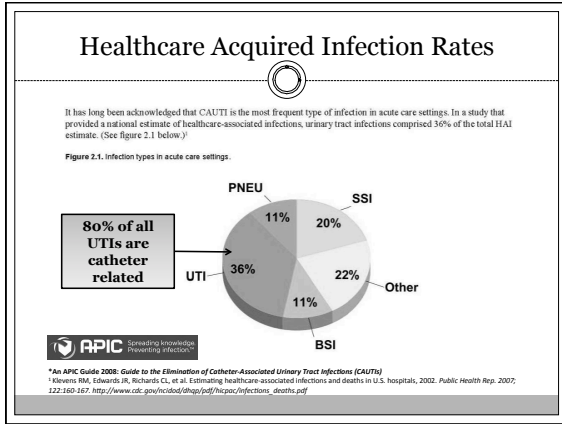
- The CDC has estimated that up to 139,000 hospital onset, symptomatic CAUTIs occurred in 2007,¹ resulting in as much as \$131 million in excess direct medical costs ²
- Each episode of UTI costs btwn. \$600-\$3803 ³⁻⁴
- UT-related bacteremia, \$2800 ⁵

1. Wise M. Burden of major hospital-onset device-associated infection types among adults and children in the United States, 2007. 21st Annual Scientific Meeting of the Society of Healthcare Epidemiology of America, April 2, 2011; Dallas, TX. Abstract 3705.
 2. Scott R. Economic burden of major device-associated, acute-care hospital-onset infections among adults and children in the United States, 2007. 21st Annual Scientific Meeting of the Society of Healthcare Epidemiology of America, April 2, 2011; Dallas, TX. Abstract 4552.
 3. Saint S. Clinical and economic consequences of nosocomial catheter-related bacteriuria. Am J Infect Cont 2000;28:68-75.
 4. McCannell E. New catheters decrease nosocomial infections. Nurs Manag 2000;31:32-35.
 5. Tambayah PA. The direct costs of nosocomial catheter-related urinary tract infection in the era of managed care. Infect Cont Hosp Epidemiol 2002;23:27-31.

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CAUTI Rates, NHSN, Jan-Dec 2010

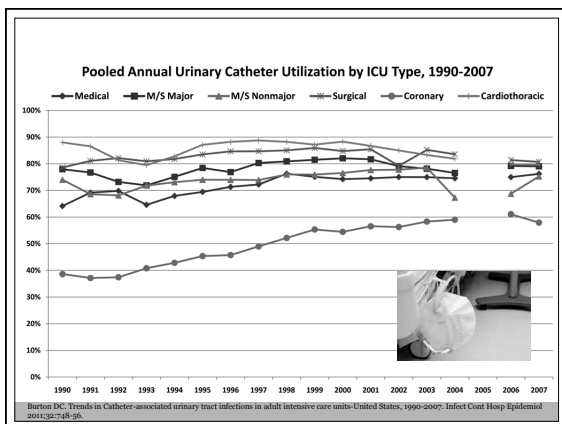
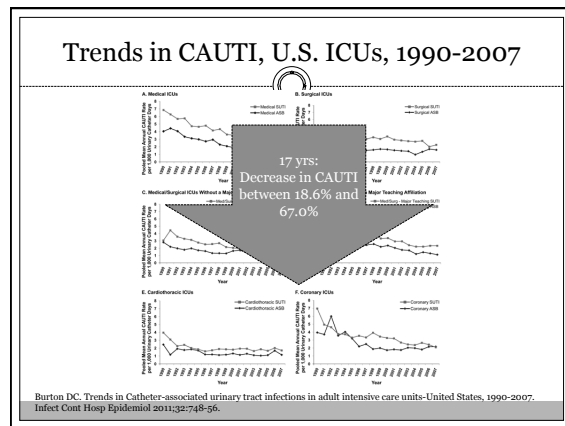
Type of location	No. of locations	No. of CAUTI	Catheter days	Pooled Mean
CRITICAL CARE				
Medical-Major teaching	67	470	192,002	2.4
Medical-All others	110	436	232,454	1.9
Medical cardiac	139	414	213,335	1.9
Medical/surgical – major teaching	98	587	263,186	2.2
Neurosurgical	45	446	110,797	4.0
Pediatric medical/surgical	78	27	57,420	2.2
Surgical – major teaching	59	471	157,384	3.0
Surgical – cardiothoracic	124	373	239,246	1.6
INPATIENT WARDS				
Medical	341	539	333,155	1.6
Medical/surgical	877	1,254	854,649	1.5
Neurosurgical	22	76	34,773	3.2
Surgical	170	362	233,119	1.6

Dukeck MA. National Healthcare Safety Network (NHSN) Report, data summary for 2010, device-associated module. AJIC 2011;39:798-816.

Urinary Catheter Utilization Ratios, NHSN, Jan-Dec 2010

Type of location	No. of locations	Catheter days	Patient days	Pooled Mean
CRITICAL CARE				
Medical-Major teaching	67	192,002	264,834	0.73
Medical-All others	110	232,454	355,856	0.65
Medical cardiac	139	213,335	431,323	0.50
Medical/surgical – major teaching	98	263,186	364,301	0.73
Neurosurgical	45	110,797	150,613	0.74
Pediatric medical/surgical	78	57,420	223,652	0.26
Surgical – major teaching	59	157,384	205,973	0.76
Surgical – cardiothoracic	124	239,246	345,376	0.69
INPATIENT WARDS				
Medical	341	333,155	1,817,691	0.18
Medical/surgical	877	854,649	4,467,055	0.19
Neurosurgical	22	34,773	108,862	0.32
Surgical	170	233,119	955,074	0.24

Dukeck MA. National Healthcare Safety Network (NHSN) Report, data summary for 2010, device-associated module. AJIC 2011;39:798-816.




- ### Regulatory: Joint Commission
- New 2012 National Patient Safety Goal:
 - NPSG.07.06.01: Implement evidence-based practices to prevent indwelling catheter-associated urinary tract infections (CAUTI)
 - Planning stage: 2012 for adult patients in hospitals
 - Full Implementation: start 1/1/13
 - EP 2: Insertion -
 - Limiting use and duration to situations necessary for patient care
 - Using aseptic technique for site preparation, equipment and supplies
 - EP 3: Management
 - Securing catheters for unobstructed urine flow and drainage
 - Maintaining the sterility of the urine collection system
 - Replacing the urine collection system when required
 - Collecting urine samples
 - EP 4: Measure and Monitor –
 - Selecting measures using evidence –based guidelines or best practices
 - Monitoring compliance with evidence based guidelines or best practices
 - Evaluating the effectiveness of prevention efforts
- R³ Report: Requirement, Rationale, Reference. Catheter-associated urinary tract infections, The Joint Commission, Sep 28, 2011.

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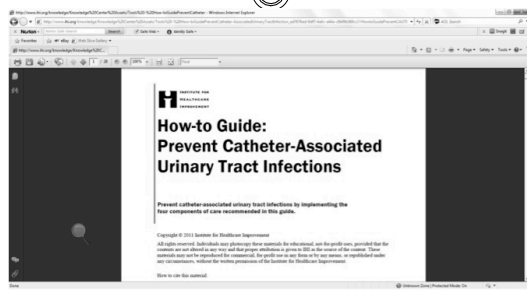
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Initiative: Health and Human Services



Available at: <http://www.hhs.gov/ash/initiatives/hai/actionplan/>, Accessed 1/22/12

Initiative: Institute for Healthcare Improvement – The Improvement Map Campaign



Available at: [http://www.ihiconline.org/Knowledge/Knowledge%20Center%20%20Links/Tools%20%20%20How-to-Guide-Prevent-Catheter-](http://www.ihiconline.org/Knowledge/Knowledge%20Center%20%20Links/Tools%20%20%20How-to-Guide-Prevent-Catheter-Associated-Urinary-Tract-Infections.pdf)

Financial: CMS - *Show Me the Money!*

- In 2007, the Centers for Medicare and Medicaid Services (CMS) announced that under a revised Acute Care Hospital Inpatient Prospective Payment System (IPPS), beginning October 1, 2008, it would no longer reimburse hospitals for costs attributable to CAUTIs.
- Starting in 2014, CMS will publically report rates of CAUTI for hospitals participating in the Hospital Inpatient Quality Reporting Program.

Saint S. Catheter-associated urinary tract infection and the Medicare Rule changes. Ann Intern Med 2009;150:877-84.

Value-Based Purchasing

- “Value-based Purchasing” is a quality improvement strategy explicitly linking payment with health care outcomes by paying more for better health care and less for inferior care.
- The new regulations enacted by CMS holds institutions financially accountable for failing to prevent complications.

Saint S. Catheter-associated urinary tract infection and the Medicare Rule changes. Ann Intern Med 2009;150:877-84.

Definition by Duration of Catheterization

- Short-term catheterization**
 - Remains indwelling \leq 2 weeks
 - Commonly used in acute or critical care settings
- Indications**
 - Continuous post-surgical bladder drainage
 - Management of acute urinary retention
 - Monitoring urinary output and/or core body temperature in critically ill patient
 - Bladder irrigation & decompression after surgery of urinary tract
 - Transient diversion in patients with non-healing perineal or sacral decubitus

Definition by Duration of Catheterization

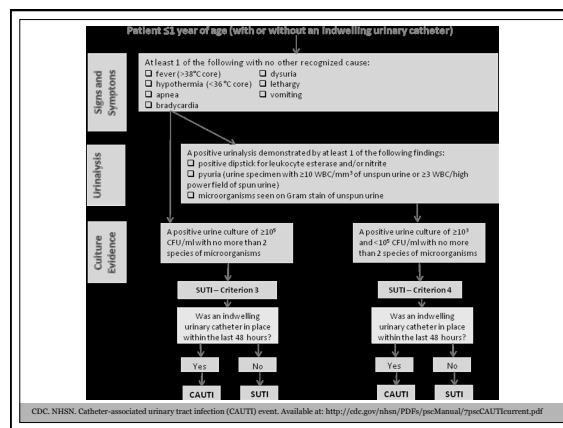
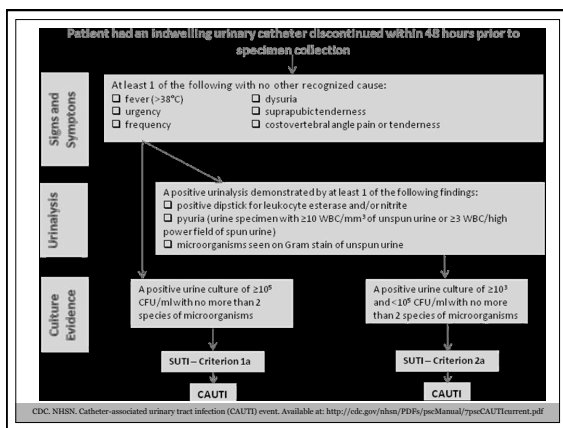
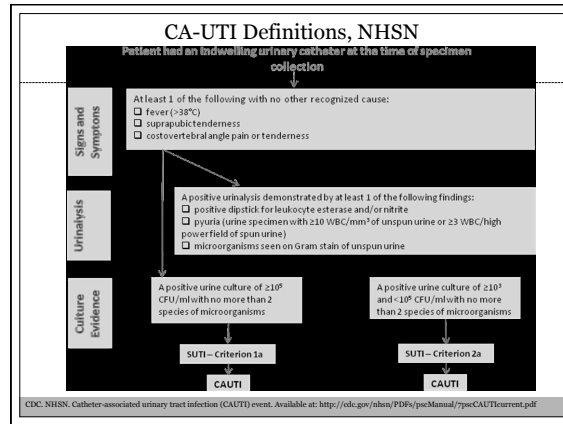
- Long-term catheterization**
 - Remains indwelling \geq 4 weeks
 - Commonly used in LTC, chronic care centers, spinal cord injury care centers
- Indications**
 - Urethral obstruction or urinary retention that cannot be managed by other means (ablation of obstruction, intermittent catheterization)
 - Urinary incontinence and urinary retention that cannot be managed by other means
 - Promote healing of Stage III-IV Pus owing to UI
 - Bladder management in palliative care setting

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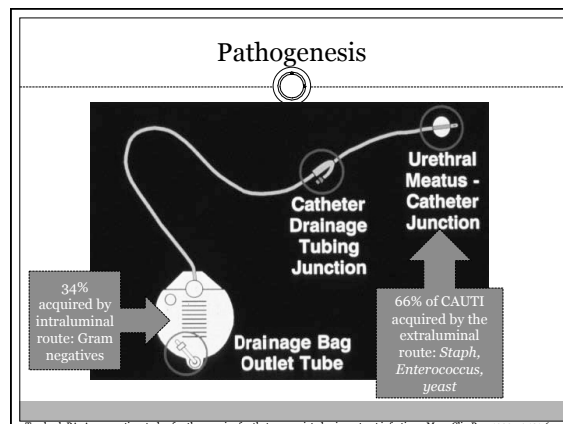
Asymptomatic Bacteriuria

- Urine is normally sterile
- *Bacteriuria* is defined by bacteria in the urine and is frequently present *without* associated UTI
- Colonization of urine occurs quickly after insertion and is nearly 100% affected after 30 days
- Consider bacteriuria as inevitable
- *Asymptomatic bacteriuria* (no associated symptoms of a UTI) should not be treated in any care setting



Progression of Bacteriuria to UTI

- 10%-25% of patients with bacteriuria will develop signs and symptoms of UTI
- Nearly all patients developing CA-UTI have had biofilm formation of the material surface
- 1%-4% will develop bacteremia



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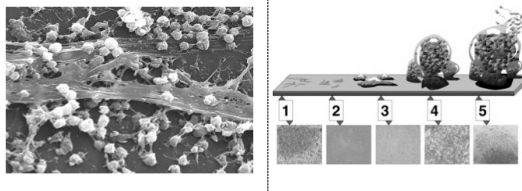
Pathogenesis

- Extraluminal acquisition of organisms is usually associated with endogenous organisms, i.e., bacteria that colonize the patient's own perineum
- Intraluminal acquisition is most often associated with exogenous organisms and result from cross-contamination from the hands of healthcare workers
- Approx. 15% of episodes of healthcare-associated bacteruria occur in clusters from intrahospital transmission

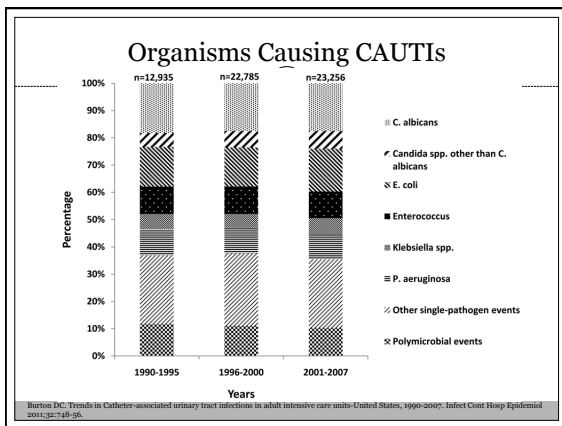
Maki DG. Engineering out the risk of infection with urinary catheters. Emerg Infect Dis 2001;7:1-6.

Catheter Biofilms

- Biofilms are composed of clusters of microorganisms in a polysaccharide matrix
- They form on intraluminal and extraluminal surfaces
- Organisms in biofilms may ascend the catheter in 1-3 days
- Biofilms form a protective environment for organisms with poor penetration by antimicrobials



Saint S. Biofilms and catheter-associated urinary tract infections. Infectious Dis Clin North America 2003;17:411-32.



Antibiotic Resistant Organisms & CAUTIs


TABLE 2. No. (%) of Causative Agents with 3-Class or 4-Class Resistance within Each Infection Type, as Reported to the National Healthcare Safety Network, 2006-2007

Organism	Ventilator-associated pneumonia	Central line-associated bloodstream infection	Catheter-associated urinary tract infection	Surgical site infection
With 3-class resistance^a				
<i>Pseudomonas aeruginosa</i> (n = 676)	242 (36)	111 (16)	292 (43)	31 (5)
<i>Acinetobacter baumannii</i> (n = 1,201)	590 (49)	372 (31)	188 (16)	51 (4)
<i>Klebsiella pneumoniae</i> (n = 675)	89 (13)	237 (35)	309 (46)	44 (6)
With 4-class resistance^b				
<i>P. aeruginosa</i> (n = 84)	34 (40)	8 (10)	38 (45)	4 (5)
<i>A. baumannii</i> (n = 489)	244 (50)	173 (35)	59 (12)	13 (3)
<i>K. pneumoniae</i> (n = 223)	31 (14)	90 (40)	83 (37)	19 (9)


^a Antimicrobial classes tested were penicillins, cephalosporins, aminoglycosides, fluoroquinolones, and carbapenems for *P. aeruginosa* and *K. pneumoniae*. Penicillins, cephalosporins, aminoglycosides, fluoroquinolones, carbapenems, and sulbactam were tested for *A. baumannii*.
^b Antimicrobials tested for all organisms included β -lactams (penicillins and cephalosporins), aminoglycosides, fluoroquinolones, and carbapenems.

Kallen AJ. Multidrug resistance among gram-negative pathogens that caused healthcare-associated infections reported to the NISSN, 2006-2008. ICHE 2010;21:528-31.

The Danger Next Door



Key Questions Prior to Understanding Prevention of CAUTI



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When is Urinary Catheterization Necessary?

- Patient has acute urinary retention or bladder outlet obstruction
- Need for accurate measurements of urinary output in critically ill patients
- Perioperative use for selected surgical procedures:
 - Patients undergoing urologic surgery or other surgery on contiguous structures of the genitourinary tract
 - Anticipated prolonged duration of surgery (catheters inserted for this reason should be removed in PACU)
 - Patients anticipated to receive large-volume infusions or diuretics during surgery
 - Need for intraoperative monitoring of urinary output
- To assist in healing of open sacral or perineal wounds in incontinent patients
- Patient requires prolonged immobilization (e.g., potentially unstable thoracic or lumbar spine, multiple traumatic injuries such as pelvic fractures)
- To improve comfort for end of life care if needed

When is Urinary Catheterization Inappropriate?

- As a substitute for nursing care of the patient or resident with incontinence
- As a means of obtaining urine for culture or other diagnostic tests when the patient can voluntarily void
- For prolonged postoperative duration without appropriate indications (e.g., structural repair of urethra or contiguous structures, prolonged effect of epidural anesthesia, etc.)

Study on Inappropriate Use (1)

- Review of charts of all patients >65 years of age who were admitted through the Emergency Department during a one month period
- Of the 1,633 patients admitted to the hospital from the ED, urinary catheters were inserted in 379 (23%)
- Only 46% of these catheters were identified as appropriately placed

Hazlett, SE. The association between indwelling urinary catheter use in the elderly and urinary tract infection in acute care. BMC Geriatrics. 2014; <http://www.biomedcentral.com/1471-2318/14/15>

Study on Inappropriate Use (2)

- Prospective study of electronic medical records of 436 patients admitted to an adult medical-surgical unit
- Criteria for appropriate use: urinary retention, urine output monitoring, medication instillation, urinary tract obstruction, neurogenic bladder dysfunction, immediate post-operative management, decubitus ulcer or other wound needing urinary diversion, or comfort care for terminally ill
- *Result: 144 patients, 557 catheter days, 31.4% of catheter days were inappropriate*


Hazlett, SE. The association between indwelling urinary catheter use in the elderly and urinary tract infection in acute care. BMC Geriatrics. 2014; <http://www.biomedcentral.com/1471-2318/14/15>

What Are Risk Factors for CAUTI?

- **Non-Modifiable (!) ¹**
 - Female sex
 - Age >50
 - Severe underlying disease
 - Nonsurgical disease
 - Diabetes mellitus
 - Serum creatinine >2 mg/dl
- **Modifiable (?) ²**
 - Duration of catheterization
 - Not maintaining a closed system

1. Chenoweth CE. Urinary tract infections. Infect Dis Clin N Am 2011;25:103-115.
 2. Lo E, et al. Strategies to prevent catheter-associated urinary tract infections in acute care hospitals. Infect Control Hosp Epidemiol 2008;29:541-550.

Prevention Recommendations



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Published Guidelines on Prevention of CAUTI

- **CDC:** Gould CV, et al. Guideline for prevention of catheter-associated urinary tract infections 2009. Healthcare Infection Control Practices Advisory Committee, CDC, Atlanta, GA, 2009.
- **SHEA:** Lo E, et al. Strategies to prevent catheter-associated urinary tract infections in acute care hospitals. *Infect Control Hosp Epidemiol* 2008;29:S41-S50.
- **IDSA:** Hooton TM, et al. Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: 2009 International clinical practice guidelines from the Infectious Diseases Society of America. *CID* 1010;50:625-663.
- **APIC:** Greene L, et al. Guide to the elimination of catheter-associated urinary tract infections (CAUTIs). Association of Professionals in Infection Control. Washington, DC, 2008.

Published Guidelines on Prevention of CAUTI

- **European Assoc. of Urology:** Tenke P, et al. European and Asian guidelines on management and prevention of catheter-associated urinary tract infections. *International J Antimicrobial Agents* 2008;31S:S68-S78.
- **DOH of England:** Pratt RJ, et al. EPIC 2: national evidence-based guidelines for preventing healthcare-associated infections in NHS hospitals in England. *J Hosp Infect* 2007;65 (Supp. 1):S1-64.
- **WOCN:** Nursing interventions to reduce the risk of catheter-associated urinary tract infections. Parts 1-3, 2009, *J Wound Ostomy Continence Nurs*;36, 23-34, 137-54, 156-9.

CDC-HICPAC Guideline Categories

Category	Recommendation
IA	A strong recommendation supported by high to moderate quality evidence suggesting net clinical benefits or harms
IB	A strong recommendation supported by low quality evidence suggesting net clinical benefits or harms or an accepted practice (e.g., aseptic technique) supported by low to very low quality evidence
IC	A strong recommendation required by state or federal regulation.
II	A weak recommendation supported by any quality evidence suggesting a trade off between clinical benefits and harms
No recommendation/Unresolved issue	Unresolved issue for which there is low to very low quality evidence with uncertain trade offs between benefits and harms

Appropriate Urinary Catheter Use

- “Insert catheters only for appropriate indications and leave in place as long as needed” (Category IB)
 - Minimize urinary catheter use and duration of use in all patients, particularly those at risk for CAUTI or mortality from catheterization such as women, the elderly, and patients with impaired immunity” (Category IB)

Appropriate Urinary Catheter Use

- “Consider using alternatives to indwelling urethral catheterization in selected patients when appropriate.”
 - “Consider using external catheters as an alternative to indwelling urethral catheters in cooperative male patients without urinary retention or bladder outlet obstruction.” (Category II)
 - “Intermittent catheterization is preferable to indwelling urethral or suprapubic catheters in patients with bladder emptying dysfunction.” (Category II)

Proper Techniques for Insertion

- “Perform hand hygiene immediately before and after insertion or any manipulation of the catheter device or site” (Category IB)
- “Ensure that properly trained persons (e.g., hospital personnel, family members, or patients themselves) who know the correct technique of aseptic catheter insertion and maintenance are given this responsibility” (Category IB)
- “In the acute care hospital setting, insert urinary catheters using aseptic technique and sterile equipment” (Category IB)
 - “Use sterile gloves, drape, sponges, an appropriate antiseptic or sterile solution for periurethral cleaning, and a single-use packet of lubricant jelly for insertion” (Category IB)
 - “Routine use of antiseptic lubricants is not necessary” (Category II)
 - “Further research is needed on the use of antiseptic solutions vs. sterile water or saline for periurethral cleaning prior to catheter insertion” (No recomm.)


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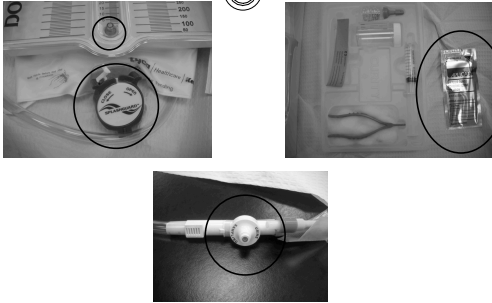
Education

“Instruction should never be the endpoint,
Competency in practice is what matters”

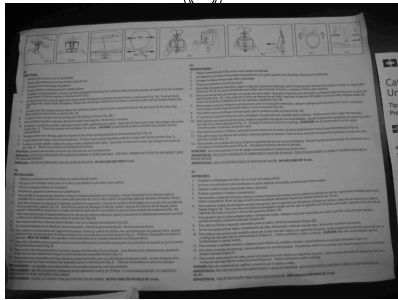
Clinicians Should Assist in Selecting Product



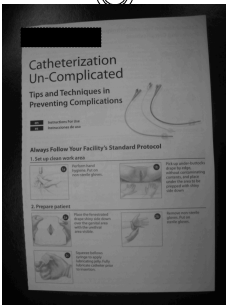
What to Look For in Catheter Products



Package Inserts (Instructions on Aseptic Techniques)



Package Inserts (Instructions on Aseptic Techniques)



Sample Manufacturer Procedure Statements

- “Tips to reduce catheter-associated urinary tract infection”
 - “Cleanse hands before and after any manipulation of the catheter or site.
 - **Do Not** touch anything which is non-sterile once you put on sterile gloves.
 - Make sure the tip of the catheter is well lubricated for easy insertion and to help prevent damage to the urethra.
 - **Do not** reinsert catheter if first insertion was unsuccessful.
 - If the catheter is inserted into the female patient’s vagina by mistake, leave it there as a marker until a new catheter is properly placed in the urethra.
 - Whenever possible, maintain a closed sterile drainage system after insertion.
 - Make sure the catheter drains. Verify that tubing is not kinked or twisted.”

Catheterization Un-complicated. Tips and techniques in preventing complications. Package insert. Kendall Precision 400, urine Meter Catheterization Tray, Covidien, Mansfield, MA

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Proper Techniques for Maintenance

- “Following aseptic insertion of the urinary bladder, maintain a closed drainage system” (Category IB)
 - “If breaks in aseptic technique, disconnection, or leakage occur, replace the catheter and collecting system using aseptic technique and sterile equipment” (Category IB)
 - “Consider using urinary catheter systems with preconnected, sealed catheter-tubing junctions” (Category II)

Proper Techniques for Maintenance

- “Maintain unobstructed urine flow” (Category IB)
 - “Keep the catheter and collecting tube free from kinking” (Category IB)
 - “Keep the collecting bag below the level of the bladder at all times” (Category IB)
 - “Empty the collecting bag regularly using a separate, clean collecting container for each patient; avoid splashing, and prevent contact of the drainage spigot with the nonsterile collecting container” (Category IB)

Major Risk Factor: Level of Placement



Tambyah PA. A prospective study of pathogenesis of catheter-associated urinary tract infections. *Mayo Clin Proc* 1999;74:131-6.

Proper Techniques for Maintenance

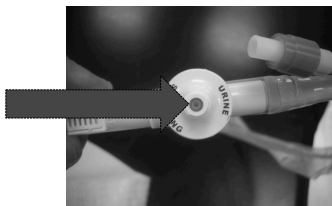
- “Changing indwelling catheters or drainage bags at routine, fixed intervals is not recommended” (Category II)
- “Do not clean the periurethral area with antiseptics to prevent CAUTI while the catheter is in place. Routine hygiene (e.g., cleaning of the meatal surface during daily bathing or showering) is appropriate” (Category IB)

Results of 2 Meta-Analysis of Antimicrobial Urinary Catheters

- Review of 12 trials; 13,392 patients
- No trials addressed symptomatic UTIs
- Studies limited by number, size, quality of studies
- These catheters may delay or prevent UTIs in select populations *with short-term catheterization*
 - Johnson JR. Systematic review: antimicrobial urinary catheters to prevent catheter-associated urinary tract infection in hospitalized patients. *Ann Intern Med* 2006;144:116-27.
- Review of 23 trials; 5,236 patients in 22 parallel group trials and 27,878 patients in one large cluster-randomized cross-over trial
- Silver oxide catheters were of no benefit
- Silver alloy catheters were found to significantly reduce asymptomatic bacteriuria in short-term catheterized patients (<7d)
- Data was insufficient to determine effect on patients catheterized for longer periods
 - Schumm K. Types of urethral catheters for management of short-term voiding problems in hospitalized adults: a short version cochrane review. *Neuro Urodynamics* 2008;27:738-46.

How should we collect urine specimens?

- “If a small volume of fresh urine is needed for examination (i.e. urinalysis or culture), aspirate the urine from the needless sampling port with a sterile syringe/cannula adaptor after cleansing the port with a disinfectant.” (Category IB)



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Implementation Strategies



Key Toolkit Questions

- **Engage:** How will this make the world a better place?
- **Educate:** How will we accomplish this?
- **Execute:** What do I need to do?
- **Evaluate:** How will we know we made a difference?
- **Endure:** How do I know it will last?
- **Expand:** Who else needs to know this?

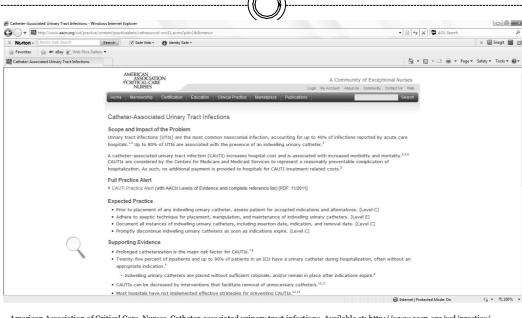
Courtesy N. Abbela, CHS

The “ABCDE Bladder Bundle”

- **A**dherence to general infection control principles (e.g., hand hygiene, surveillance and feedback, aseptic insertion, proper maintenance, education) is important
- **B**ladder ultrasound may avoid indwelling catheterization
- **C**ondom catheters or alternatives to indwelling catheter such as intermittent catheterization should be considered
- **D**o not use the indwelling catheter unless absolutely necessary
- **E**arly removal of the catheter using a reminder or nurse-initiated removal protocol appears to be warranted

Saint S. Translating health care-associated urinary tract infection prevention research into practice via the bladder bundle. Jt Comm J Qual Patient Saf 2009;35:449-55

AACN CAUTI Practice Alert



American Association of Critical Care Nurses. Catheter-associated urinary tract infections. Available at: <http://www.aacn.org/ind/practice-alert/cuti>

Consensus Across all Guidelines

1. Catheterize only when necessary and only for as long as necessary
2. Insert catheters using aseptic techniques and sterile equipment
3. Maintain closed, sterile drainage system

Conway LJ. Guidelines to prevent catheter-associated urinary tract infection: 1980-2010. Heart and Lung, 2011; in press.

Implementation Strategies

- Daily reviews of patients with indwelling catheters
- Standardized reminders
- Automatic stop orders
- Nurse-directed protocols to discontinue catheters

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Examples of CAUTI Reduction Strategies (1)

- **Study Unit:** Med-Surg-Trauma ICU
- **Objective:** reduce CAUTI by decreasing use of urinary catheters
- **Intervention period:** 12 mos
- **Team:** Multidisciplinary including staff nurses
- **Methods:** Use of criteria-based urinary catheter guidelines, a decision-making algorithm, and a daily checklist
- **Results:**
 - Usage – decreased from a mean cath device days of 4.72 vs. 2.98
 - Decrease of 408 catheter days
 - CAUTI rates – decreased 33%

Reilly LR. Reducing Foley catheter device days in an intensive care unit. AACN Adv Crit Care 2008;17:272-83.

Examples of CAUTI Reduction Strategies (2)

- **Study Unit:** MICU
- **Objective:** reduce CAUTI by decreasing use of urinary catheters
- **Intervention period:** 11 mo vs. 6 mo
- **Methods:** daily evaluation using criteria for appropriate use
- **Results:**
 - Usage – decreased from 311.7 d/mo to 238.6 d/mo
 - CAUTI rates – decreased from 4.7/1000 CD to zero
 - 32% of device days were considered inappropriate

Elpern EH. Reducing use of indwelling urinary catheters and associated urinary tract infections. AJCC 2009;18:535-41.

Examples of CAUTI Reduction Strategies (3)

- **Study Unit:** 228-bed hospital
- **Objective:** reduce CAUTI by decreasing use of urinary catheters
- **Intervention period:** 6 mo
- **Team:** infection control, education, nursing, performance, improvement, risk management, and pharmacy
- **Methods:** weekly catheter patrols to identify patients with catheters and appropriateness of use
- **Results:**
 - CAUTI rates – decreased from 4 CAUTI/mo to zero

McLaughlin A. Catheter patrols: a unique way to reduce the use of convenience urinary catheters. Ger Nurs 1996;17:240-43.

Examples of CAUTI Reduction Strategies (4)

- **Study Unit:** 4 hospital wards (2 control, 2 intervention)
- **Objective:** decrease use of urinary catheters
- **Methods:** A simple written reminder provided to the patient's clinical team that the patient has a urinary catheter
- **Results:**
 - 5,678 patients evaluated
 - Control group – avg. proportion of time pts. catheterized increased by 15.1%
 - Intervention group - avg. proportion of time pts. catheterized decreased by 7.6%

McLaughlin A. Catheter patrols: a unique way to reduce the use of convenience urinary catheters. Ger Nurs 1996;17:240-43.

Examples of CAUTI Reduction Strategies (5)

- **Study Unit:** Adult ICUs, Large hospital, Taiwan
- **Objective:** reduce CAUTIs and decrease use of urinary catheters
- **Study period:** Nov 2000-Dec 2002
- **Methods:** Nurse-generated daily reminders provided to the physicians to remove unnecessary urinary catheters 5 days after insertion
- **Results:**
 - 6,297 patients evaluated
 - Avg. duration of catheterization decreased from 7.0d to 4.6d
 - CAUTI rate – decreased from 11.5/1000 CD to 8.3/1000 CD
 - Monthly cost of antibiotics was reduced by 69%

Huang W-C. Catheter-associated urinary tract infections in intensive care units can be reduced by prompting physicians to remove unnecessary catheters. ICHE 2004;25:974-78.

Examples of CAUTI Reduction Strategies (6)

- **Study Unit:** 4 general medical units
- **Objective:** reduce CAUTIs and decrease use of urinary catheters
- **Intervention period:** 2 periods, one year each
- **Methods:** CPOE system updating physician of urinary catheter insertion and prompting options for minimizing duration; nurse-directed protocol for removal; use of bladder scanners
- **Results:**
 - 81% of caths inserted in ED; only 22% had physician orders
 - Catheter days – decrease from 892 to 521 to 184
 - CAUTI rate (per 1000 CD) – decreased from 36 to 19 to 11
 - CAUTI reduced by 81%

Topal J. Prevention of nosocomial catheter-associated urinary tract infections through computerized feedback to physicians and a nurse-directed protocol. Am J Med Qual 2005;20:121-26.

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Examples of CAUTI Reduction Strategies (7)

- **Study Unit:** 2 units, medical-cardiology (VA med ctr)
- **Objective:** decrease use of urinary catheters
- **Intervention period:** 8 weeks each unit; cross-over study
- **Methods:** computer-based order for insertion, computer-generated reminders to remove catheters
- **Results:**
 - 29% of patients on control ward had orders vs. 92% in study group
 - Catheter days – Control - 8 vs. Study group - 3
 - No enough study power to detect CAUTI difference

Cornia PB. Computer-based order entry decreases duration of indwelling urinary catheterization in hospitalized patients. Am J Med 2003;114:404-7.

Examples of CAUTI Reduction Strategies (8)

- **Study Unit:** 3 hospitals, Ontario, Canada
- **Objective:** reduce CAUTIs and decrease use of urinary catheters
- **Design:** patients with urinary catheters randomized to stop orders for removal of catheters if specified criteria were not present or to usual care
- **Results:**
 - 692 patients in the study
 - Inappropriate catheter days: Control – 3.89 vs. Study group – 2.20
 - Total catheter days: Control – 5.04 vs. Study group – 3.70
 - CAUTI rate: Control – 19%, Study – 20%

Loeb M. Stop orders to reduce inappropriate urinary catheterization in hospitalized patients: a randomized controlled trial. J Gen Intern Med 2008;23:816-20.

Examples of CAUTI Reduction Strategies (9)

- **Study Unit:** 28-bed medical-surgical ICU
- **Objective:** reduce CAUTIs
- **Intervention Period:** one year
- **Methods:** physician-led multidisciplinary rounds, use of prevention bundles, culture changes with focus on team decision making process
- **UTI bundle:** regular assessment of continued need, sterile insertion technique, daily perineal care, drainage bag lower than patient’s bladder, secure all catheters, use silver-coated catheters in selected cases
- **Results:**
 - Urinary catheter days: Baseline – 7,691 vs. Study – 5,780
 - CAUTI rate (per 1000 CD) Baseline – 3.8, Study – 2.4

Jain M. Decline in ICU adverse events, nosocomial infections and cost through a quality improvement initiative focusing on teamwork and culture change. Qual Saf Health Care 2006;15:235-39.

Conclusion

“The bulk of the evidence is consistent with the view that multimodal strategies could prevent between 25% and 75% of catheter-associated urinary tract infections”

Saint S. Catheter-associated urinary tract infection and the Medicare Rule changes. Ann Intern Med 2009;150:877-84.

National Survey on Prevention of UTIs

- Ransom sample of hospitals with ICUs and >50 beds to determine the extent of prevention practices
- 119 VA hospitals, 2671 Non-VA hospitals
- **Results:**
 - ~56% of hospitals did not have system for monitoring which patients had urinary catheters
 - ~74% did not monitor catheter duration
 - ~70% did not have established system for monitoring UTI rates
 - Only ~10% used either catheter reminders or stop orders.
- **Conclusion:** no single strategy was widely used for the prevention of nosocomial UTI

Saint S. Preventing hospital-acquired urinary tract infection in the United States: A National Survey. CID 2008;46:243-50.

Process Measures: Compliance with documentation of indication for catheter placement

- “Conduct random audits of selected units and calculate compliance rate.
 - Numerator: number of patients with urinary catheters on the unit with proper documentation of indication.
 - Denominator: number of patients on the unit with a urinary catheter in place.
 - Multiply by 100 so that the measure is expressed as a percentage.”

Lo E, et al. Strategies to prevent catheter-associated urinary tract infections in acute care hospitals. Infect Control Hosp Epidemiol 2008;29:541-50.

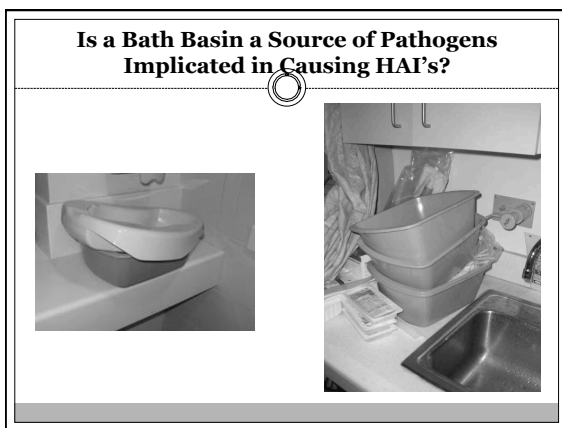
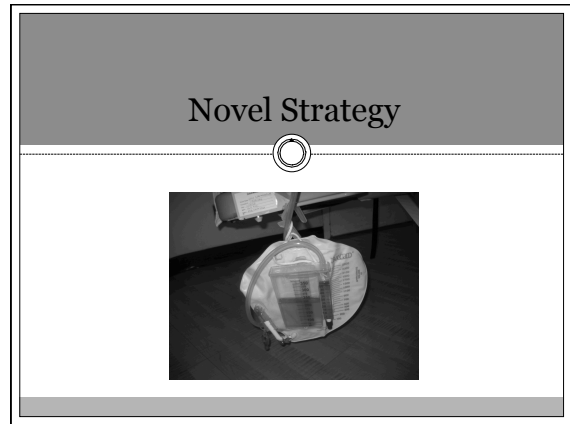
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Assessing the Need for a Catheter

Urinary Catheter Prevalence Form					
UNIT:		Date:			
Room/bed	Patient #	Cath Present?	Need	Indication	Comment

Cath Present: 0=No; 1=Yes; Need: 0=No need; 1=Need
 Indication: 1=urinary tract obstruction; 2=neurogenic bladder; 3=urologic study/surgery; 4=stage 3 or 4 sacral decubitus;
 5=hoopice/comfort care/palliative; 6=neurology; 7=ICU; 8=pt requests; 9=confused; 10=incontinent; 11=other.



Study on Bath Basin Removal and Effect on CAUTI

Stone S. Removal of bath basins to reduce catheter-associated urinary tract infections.

Background

- Study conducted at a non-profit, 370-bed facility in Suffern, NY, providing emergency, medical, surgical, obstetrical-gynecological and acute care services
 - CA-UTI rates were at 6.55 per 1000 Foley-catheter days for the hospital in 2008
- Implemented bundle October 2008
 - 2009, CA-UTI rates were at 3.03 per 1000 catheter days
- Decision made to remove bath basins in 2 med-surg units
- Replaced with pre-packaged wash cloths

•GOAL:

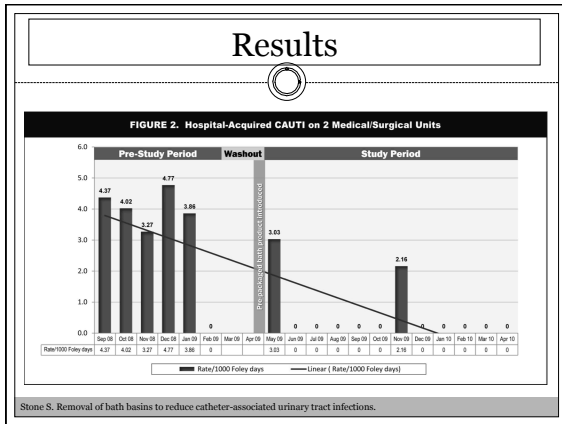
ZERO

Results

Stone S. Removal of bath basins to reduce catheter-associated urinary tract infections.

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- ### Summary of Strategies
- ✓ Insert catheters only when necessary
 - ✓ Consider alternate type catheters
 - ✓ Assess urinary catheter prevalence
 - ✓ Establish evidence-based policy reflecting currently used products
 - ✓ Educate all relevant staff on proper insertion/maintenance
 - ✓ Conduct competency to ensure staff are implementing policy components
 - ✓ Analyze data on rates and utilization based on established definitions; provide feedback to staff on all units
 - ✓ Implement reminders/nurse protocols for catheter removal
 - ✓ Consider limiting exposure to potentially contaminated environmental sources such as wash basins

- ### Recommended Reading
- Parker D, Callan L, Harwood J, et al. Nursing interventions to reduce the risk of catheter-associated urinary tract infection. Part 1: Catheter Selection. *J Wound Ostomy Continence Nurs* 2009;36:23-34.
 - Parker D, Callan L, Harwood J, et al. Nursing interventions to reduce the risk of catheter-associated urinary tract infection. Part 2: Staff education, Monitoring, and Care Techniques. *J Wound Ostomy Continence Nurs* 2009;36:137-54.

Thank you!

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Coming Soon

17 May **Bug Basics – Essential Microbiology for Everyone**
 Speaker: Jim Gauthier, Providence Continuing Care, Kingston

24 May **Healthcare Workplaces – Moving from Discord to Patient-Centered**
 Speaker: Dr. Irwin Rubin, Temenos Inc, Honolulu

31 May **Infection Prevention for Outpatient Settings: Minimum Expectations for Safe Care**
 Speaker: Dr. Melissa Schaefer, Centers for Disease Control and Prevention, Atlanta
 Sponsored by Virox Technologies Inc (www.virox.com)

05 June *(Free teleclass – Broadcast live from APIC conference)* **MDR Gram-Negative Infections: Across the Continuum of Care**
 Speaker: Prof. Keith Kaye, Wayne State University
 Sponsored by the Association of Professionals in Infection Prevention & Control

06 June *(Free WHO Teleclass – Europe)* **Economic Impact of Healthcare-Associated Infections in Low and Middle Income countries**
 Speaker: Dr. Melissa Schaefer, Centers for Disease Control and Prevention, Atlanta
 Sponsored by WHO First Global Patient Safety Challenge – Clean Care is Safer Care

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