Catheter Associated Urinary Tract Infections (CAUTI): Monitoring and Prevention.

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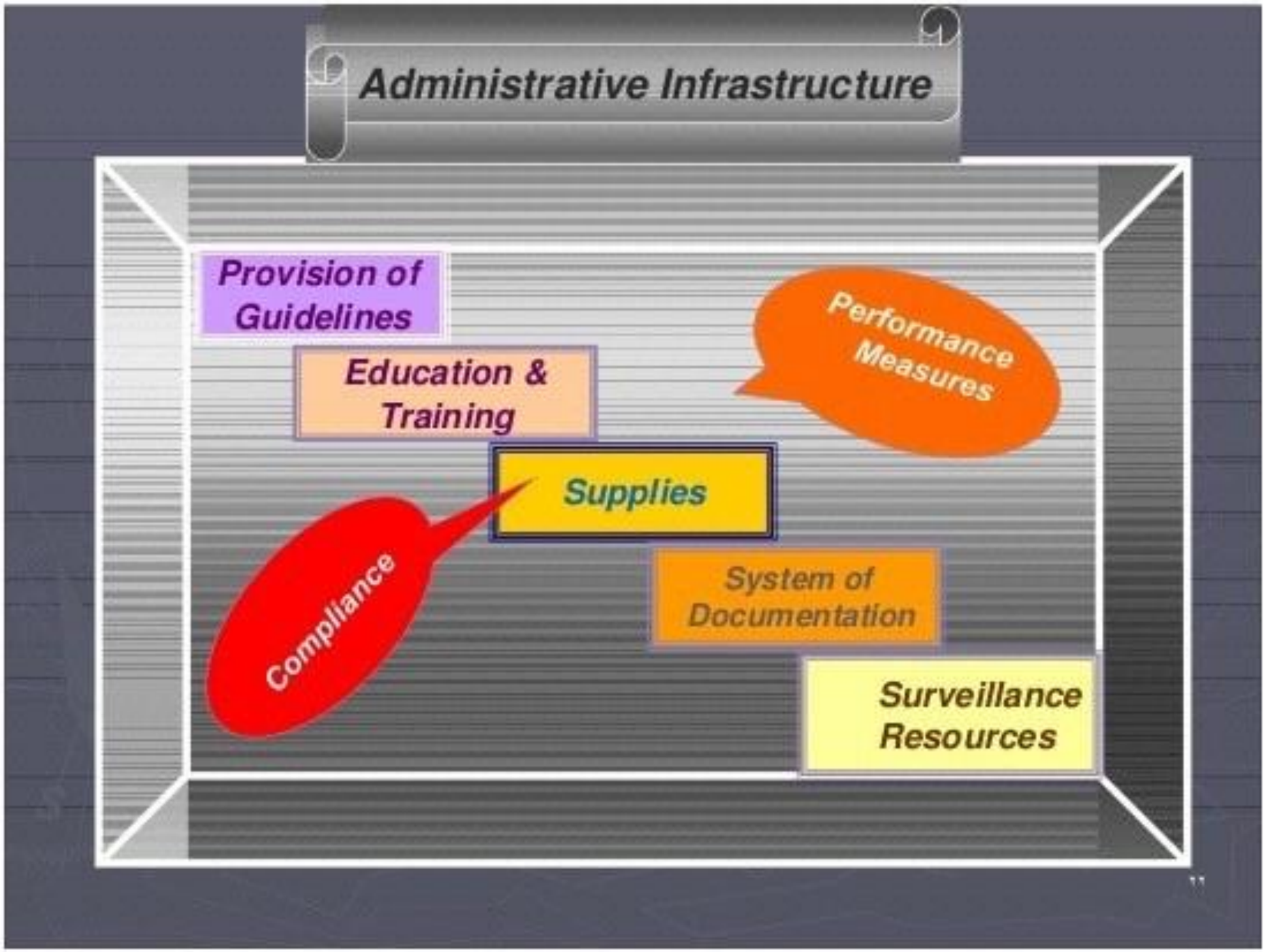
Section Two


Administrative Infrastructure
Provision of Guidelines
Education & Training
Supplies
Performance Measures
Compliance
System of Documentation
Surveillance Resources

Prevention Strategies

- **Core Strategies**
  - High levels of scientific evidence
  - Demonstrated feasibility
- **Supplemental Strategies**
  - Some scientific evidence
  - Variable levels of feasibility

*The Collaborative should at a minimum include core prevention strategies. Supplemental prevention strategies also may be used. Most core and supplemental strategies are based on HICPAC guidelines. Strategies that are not included in HICPAC guidelines will be noted by an asterisk (*) after the strategy. HICPAC guidelines may be found at www.cdc.gov/hicpac

Core Prevention Strategies (all Category IB)

- Insert catheters only for appropriate indications
- Leave catheters in place only as long as needed
- Ensure that only properly trained persons insert and maintain catheters
- Insert catheters using aseptic technique and sterile equipment (acute care setting)
- Following aseptic insertion, maintain a closed drainage system
- Maintain unobstructed urine flow
- Hand hygiene and Standard (or appropriate isolation) Precautions

http://www.cdc.gov/hicpac/cauti/001_cauti.html

Core Prevention Strategies
Insertion

- Insert catheters only for appropriate indications
  - Minimize use in all patients, particularly those at higher risk of CAUTI and mortality (women, elderly, impaired immunity)
  - Avoid use for management of incontinence
  - Use catheters in operative patients only as necessary

http://www.cdc.gov/hicpac/cauti/001_cauti.html

Core Prevention Strategies
Insertion

- Insert catheters only for appropriate indications

Table 2. A. Examples of Appropriate Indications for Indwelling Urethral Catheter Use [1-4]
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

http://www.cdc.gov/hicpac/cauti/001_cauti.html

Urinary Catheter Insertion Kit

- Sterile gloves
- Sterile drapes
- Site cleaning supplies
- Sterile lubricant
- Sterile catheter attached to drainage bag (seal)
- Hand Hygiene & Aseptic Technique

Core Prevention Strategies
Maintenance

- Following aseptic insertion, maintain a closed drainage system
  - If breaks in aseptic technique, disconnection, or leakage occur, replace catheter and collecting system using aseptic technique and sterile equipment
  - Consider systems with preconnected, sealed catheter-tubing junctions (II)
  - Obtain urine samples aseptically

http://www.cdc.gov/hicpac/cauti/001_cauti.html

Core Prevention Strategies
Maintenance

- Leave catheters in place only as long as needed
  - Remove catheters ASAP postoperatively, **preferably within 24 hours**, unless there are appropriate indications for continued use

http://www.cdc.gov/hicpac/cauti/001_cauti.html

Core Prevention Strategies
Maintenance

- Maintain unobstructed urine flow
  - Keep catheter and collecting tube free from kinking
  - Keep collecting bag below level of bladder at all times (do not rest bag on floor)
  - Empty collecting bag regularly using a separate, clean container for each patient.
  - Ensure drainage spigot does not contact non-sterile container.

http://www.cdc.gov/hicpac/cauti/001_cauti.html


Wheelchair not included.

CAUTI Maintenance Bundle

- **Maintain urinary catheters based on recommended guidelines:**
  - **Collection bag is not on the floor**
  - **Collection bag is secured to the leg**
  - **Every patient with a catheter has a labeled urine collection container at the bedside**
- **Review urinary catheter necessity daily and remove promptly**

Core Prevention Strategies:
Specific recommendations (IB)

- Implement quality improvement programs to enhance appropriate use of indwelling catheters and reduce risk of CAUTI

  Examples:
  —Alerts or reminders
  —Stop orders
  —Protocols for nurse-directed removal of unnecessary catheters
  —Guidelines/algorithms for appropriate perioperative catheter management

http://www.cdc.gov/hicpac/cauti/001_cauti.html

Supplemental Prevention Strategies: Examples

- Consideration of alternatives to indwelling urinary catheterization (II)
- Use of portable ultrasound devices for assessing urine volume to reduce unnecessary catheterizations (II)
- Use of antimicrobial/antiseptic-impregnated catheters (IB, after first implementing core recommendations for use, insertion, and maintenance)

http://www.cdc.gov/hicpac/cauti/001_cauti.html

Supplemental Prevention Strategies: Alternatives to Indwelling Catheterization

- Intermittent catheterization – consider for:
  - Patients requiring chronic urinary drainage for neurogenic bladder
    - Spinal cord injury
    - Children with myelomeningocele
  - Postoperative patients with urinary retention
  - May be used in combination with bladder ultrasound scanners
- External (i.e., condom) catheters – consider for:
  - Cooperative male patients without obstruction or urinary retention

http://www.cdc.gov/hicpac/cauti/001_cauti.html

Supplemental Prevention Strategies: Silver-Coated Catheters

- Decreased risk of bacteriuria compared to standard latex catheters in a meta-analysis of RCTs
- Effect greater for patients catheterized < 1 week

http://www.cdc.gov/hicpac/cauti/001_cauti.html

Summary of Prevention Measures*

Core Measures

1. **Insert catheters only for appropriate indications**
2. **Leave catheters in place only as long as needed**
3. **Only properly trained persons insert and maintain catheters**
4. **Insert catheters using aseptic technique and sterile equipment**
5. **Maintain a closed drainage system**
6. **Maintain unobstructed urine flow**
7. **Hand hygiene and standard (or appropriate isolation) precautions**

Supplemental Measures

- Alternatives to indwelling urinary catheterization
- Portable ultrasound devices to reduce unnecessary catheterizations
- Antimicrobial/antiseptic-impregnated catheters

*All recommendations in HICPAC guidelines at:

http://www.cdc.gov/hicpac/cauti/001_cauti.html

UTI Prevention

- **Risk of CAUTI is 5% per day catheter is in situ**
- **Increases to 25% after 1 week in situ**
- **Increases to 100% after 1 month in situ**

Strategies NOT recommended for CAUTI prevention

- Complex urinary drainage systems (e.g., antiseptic-releasing cartridges in drain port)
- Changing catheters or drainage bags at routine, fixed intervals (clinical indications include infection, obstruction, or compromise of closed system)
- Routine antimicrobial prophylaxis
- Cleaning of periurethral area with antiseptics while catheter is in place (use routine hygiene)
- Irrigation of bladder with antimicrobials
- Instillation of antiseptic or antimicrobial solutions into drainage bags
- Routine screening for asymptomatic bacteriuria (ASB)

http://www.cdc.gov/hicpac/cauti/001_cauti.html

Measurement: Examples of Process Measures

- Compliance with hand hygiene
- Compliance with educational program
- Compliance with documentation of catheter insertion and removal
- Compliance with documentation of indications for catheter placement

http://www.cdc.gov/hicpac/cauti/001_cauti.html

Evaluation Considerations

- **Assess baseline policies and procedures**
- **Areas to consider**
  - **–Surveillance**
  - **– Prevention strategies**
  - **– Measurement**
- **Coordinator should track new policies/practices implemented during collaboration**

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Policy Code: **PCI-IPC-??**	Issue Date: 25-04-2016	Issue Number:1/00
Title: **Prevention Bundle Elements- CAUTI**		
Applies to: Doctors, Registered Nurses & Midwives.		Pages: **(5)**

1.0 PURPOSE:

1.1 To identify approved indications for urinary catheterization and describe proper insertion, catheter care and prompt removal of a urinary catheter to reduce patients' risk for a **C**atheter **A**ssociated **U**rinary **T**ract **I**nfection (CAUTI).

2.0 DEFINITION:

2.1 The process of Insertion of a sterile catheter in to the urinary bladder may be completed by physicians (for males), & / or a licensed female nurse (for female patient) after a physician's order has been obtained.

3.0 RESPONSIBILITIES:

3.1 Physicians

3.2 Registered Nurses

3.3 Registered Midwives

4.0 EQUIPMENT:

4.1 Soap & water.

4.2 Alcohol Gel.

4.3 Sterile gloves (Appropriate size).

4.4 Dressing set / Catheter tray with drainage bag.

4.5 Appropriate antiseptic (Chlorhexidine solution 4%. Or Betadine solution 10%).

4.6 Single packet of lubricant jelly

5.0 ACTIVITIES:

5.1 **Insertion**

5.1.1 Use aseptic technique for insertion

5.1.2 Avoid unnecessary catheterization (Do not use indwelling catheter unless you have to!).

5.1.3 Use ***condom or intermittent catheterization*** in appropriate patients.

5.1.4 Select ***appropriate catheter*** (i.e. Size / type), (Smallest bore catheter size possible to prevent urethral trauma & subsequent bacterial colonization (Preferably smaller than an 18 FR)

5.2 **Maintenance:-**

5.2.1 Provide daily urinary catheter care

5.2.2 Maintain a closed drainage system.

5.2.3 Maintain hygiene (Provide ***perineal care*** on a daily basis & after bowel movement (at least once per shift).

5.2.4 Keep bag below level of bladder all the time.

5.2.5 Empty ***drainage bag*** regularly using a separate, clean container for each patient.

5.2.6 Use a sterile drainage spigot, ensure it does not contact nonsterile container.

5.2.7 Maintain Unobstructed flow

5.2.8 ***Avoid*** application of antibiotic creams & ointments.

5.2.9 ***Avoid*** routine bladder irrigation.

5.2.10 Perform ***daily review*** of the need for the urinary catheter (Early removal of the catheter using reminders or stop-orders appears warranted).

5.2.11 Remove catheter when no longer needed

5.2.12 Secure all catheters.

Point Prevalence Study

Catheter utilization ratio =

# of patients with urinary catheters

# of patients at a point in time

X 100

The CAUTI Rate:-

$$\left[\frac{\text{Number of CAUTIs}}{\text{Number of catheter days}}\right] \times 1000$$

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Urinary Tract infection (UTI)

*required for saving **required for completion

Facility ID:	Event #:
*Patient ID:	Social Security #:
Secondary ID:	Medicare #:
Patient Name, Last:	First: Middle:
*Gender: F M Other	*Date of Birth:
Ethnicity (Specify):	Race (Specify):
*Event Type: UTI	*Date of Event:
Post-procedure UTI: Yes No	Date of Procedure:
NHSN Procedure Code:	ICD-10-PCS or CPT Procedure Code:

*MDRO Infection Surveillance:

☐ Yes, this infection's pathogen & location are in-plan for Infection Surveillance in the MDRO/CDI Module

☐ No, this infection's pathogen & location are **not** in-plan for Infection Surveillance in the MDRO/CDI Module

*Date Admitted to Facility:	*Location:

Risk Factors

*Urinary Catheter status:

☐ In place – Urinary catheter in place > 2 days on the date of event

☐ Removed – Urinary catheter in place > 2 days but removed the day before the date of event

☐ Neither – Not catheter associated – Neither in place nor removed

Location of Device Insertion: _____ Date of Device Insertion: ____/____/_____

If NICU, birth weight (gms): _____

Event Details

*Specific Event: ☐ Symptomatic UTI (SUTI) ☐ Asymptomatic Bacteremic UTI (ABUTI) ☐ Urinary System Infection (USI)

*Specify Criteria Used: (check all that apply)

Signs & Symptoms

Any Patient

☐ Fever
☐ Frequency
☐ Pain or tenderness
☐ Acute pain, swelling, or tenderness of testes, epididymis, or prostate
☐ Suprapubic tenderness
☐ Costovertebral angle pain or tenderness
☐ Purulent drainage from affected site
☐ Urgency
☐ Dysuria
☐ Abscess
☐ Other evidence of infection found on invasive procedure, gross anatomic exam, or histopathologic exam‡

‡ per specific site criteria

≤ 1 year old

☐ Fever
☐ Hypothermia
☐ Apnea
☐ Bradycardia
☐ Lethargy
☐ Vomiting

Laboratory & Diagnostic Testing

☐ 1 positive culture with no more than 2 species of organisms, at least one of which is a bacterium of ≥ 10^5 CFU/ml
☐ Positive culture
☐ Positive blood culture
☐ Imaging test evidence of infection

*Secondary Bloodstream Infection: Yes No

**Died: Yes No	UTI Contributed to Death: Yes No
Discharge Date:	*Pathogens Identified: Yes No *If Yes, specify on pages 2-4.

Case 1

- 50 year old, end stage pancreatic cancer, liver & bone mets admitted with advance directive for comfort care only; foley catheter, peripheral IV & nasal cannula inserted
- Day 4: patient is febrile to 38.0°C & has suprapubic tenderness; IV ampicillin started after urine obtained for culture
- Day 5: difficulty breathing; CXR =infiltrate L lung base
- Day 6: urine culture results =10_5 CFU/ml E coli
- Day 7: WBC/mm3 =3400; patchy infiltrates in both lung bases; continued episodes of dyspnea; rales noted in LLL
- Day 11: Patient expired

Does this patient have a UTI? If, so what type?

- 1.Yes. SUTI Criterion 1a.
- 2.Yes, SUTI Criterion 2a.
- 3.Yes, ABUTI.
- 4.No UTI.

Criterion	Urinary Tract Infection (UTI)
	Symptomatic UTI (SUTI) Must meet at least ***one*** of the following criteria:
SUTI 1a **Catheter-associated Urinary Tract Infection (CAUTI)**	Patient must meet 1, 2, and 3 below: 1. Patient had an indwelling urinary catheter that had been in place for > 2 days on the date of event (day of device placement = Day 1) AND was either: • Present for any portion of the calendar day on the date of event†, OR • Removed the day before the date of event‡ 2. Patient has at least ***one*** of the following signs or symptoms: • fever (>38.0°C) • suprapubic tenderness* • costovertebral angle pain or tenderness* • urinary urgency ^ • urinary frequency ^ • dysuria ^ 3. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium of $\geq 10^5$ CFU/ml (See Comment Section on page 7-8). All elements of the UTI criterion must occur during the Infection Window Period (See Definition Chapter 2 Identifying HAIs in NHSN).

Case 2

- 84 year old patient is hospitalized with GI bleed
- Day 3: Patient has indwelling catheter in place and no signs or symptoms of infection
- Day 9: Patient becomes unresponsive, is intubated and CBC shows WBC of 15,000. Temp 38.0°C. Patient is pan-cultured. Blood culture and urine both grow Streptococcus pyogenes – urine >105 CFU/ml.

Is this a UTI? If so, what type?

- No. Because the blood seeded the urine and therefore there is no UTI.
- 2.Yes, ABUTI.
- 3.Yes, SUTI Criterion 1a with secondary BSI.

Case 3 - Rationale

ABUTI:

- **–No signs or symptoms (fever not > 38°C)**
- **–Positive blood culture with at least 1 uropathogen matching to the urine culture**

References/resources

- Gould CV, Umscheid CA, Agarwal RK, Kuntz G, Pegues DA, and HICPAC. Guideline for Prevention of Catheter-associated Urinary Tract Infections 2009.http://www.cdc.gov/hicpac/cauti/001_cauti.html

  - IHI Program to Prevent CAUTI http://www.ihi.org/
  - APIC CAUTI Elimination Guide http://www.apic.org/
  - IDSA Guidelines (Clin Infect Dis 2010;50:625-63)
  - SHEA/IDSA Compendium (ICHE 2008;29:S41-S50)
  - National Quality Forum (NQF) Safe Practices for Better Healthcare – Update April 2010
  - CDC/Medscape collaboration http://www.cdc.gov/hicpac/

Thank You !!!

Questions?