

# Utilization of Indwelling Foley Catheterization in a Multi- hospital System

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# Overview

- 22 Hospitals in the UHS System were assessed by Bard Clinical Specialists
- 2,334 inpatients across the system
- 611 or 26.2% of patients had a Foley catheter inserted
- Foley utilization ranged from 17.9% to 40.6%

# Foley Utilization Survey

- Examine reasons for Foley catheter insertion
  - 13 or 59% of all UHS hospitals had established criteria for Foley insertion.
  - 383 patients were reviewed
    - 68% of these patients had reasons accepted for insertion justified by the nurses

# Practices and/or policies in place Comprehensive Survey

- of the 13 hospitals assessed:
  - Automatic Stop Orders 38%
  - Computer Reminder Systems 31%
  - Daily Assessment 61%
  - Nurse directed protocol 38%
  - Policy for bladder scan 46%
  - Policies or protocols for alternative devices 23%
  - Foley catheter maintenance bundle 46%

# Comprehensive Survey Questions

- Do you have written policies and/or procedures for indwelling urinary catheters?

– If yes, do they include:

- Criteria/indications for catheter insertion/use?
  - Physician order or nurse-directed protocol?
- Criteria/indications for catheter discontinuation?
  - Physician order or nurse-directed protocol?

Techniques/criteria for aseptic catheter insertion?

Techniques/criteria for appropriate catheter maintenance?

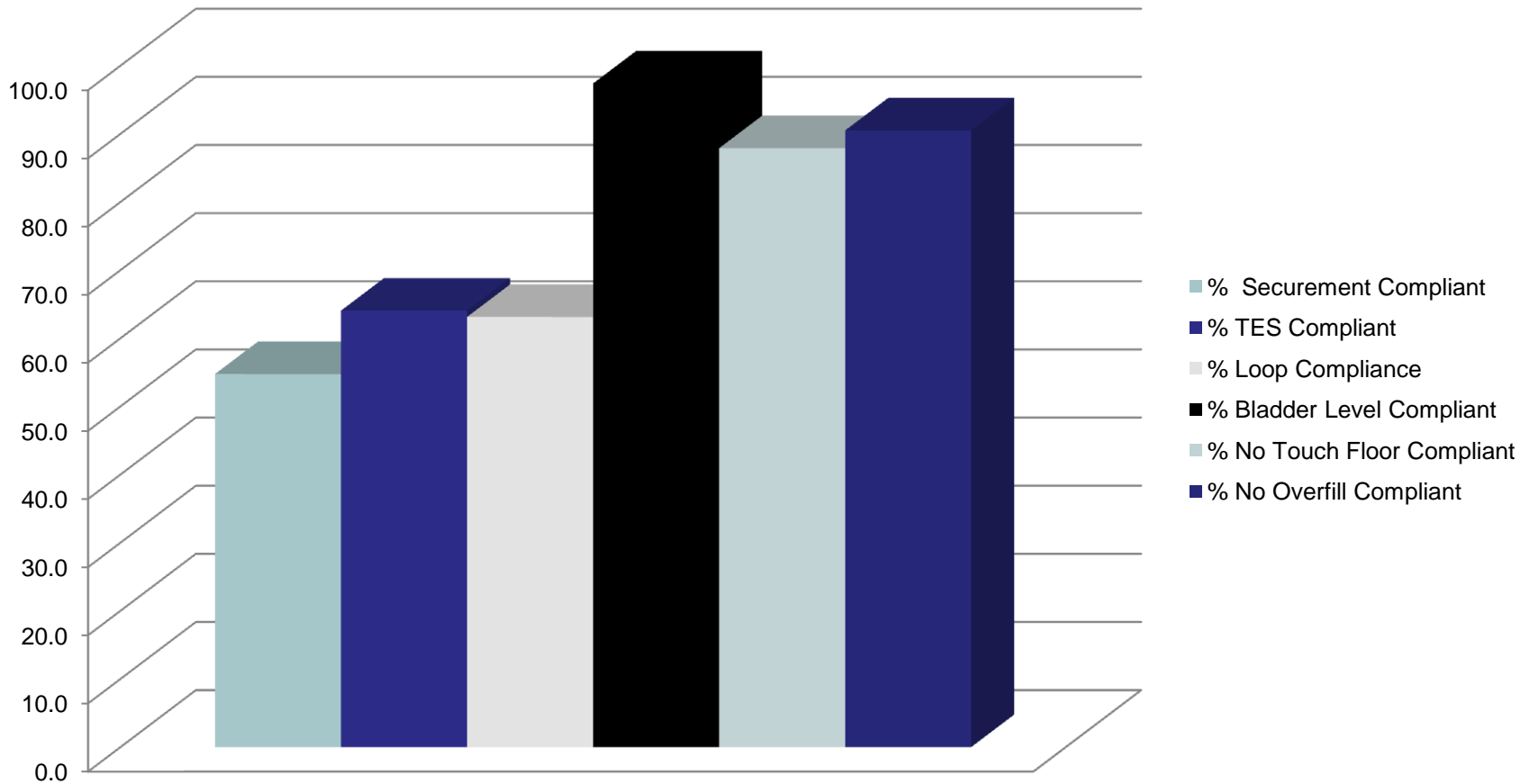
Defined criteria for healthcare providers qualified to insert/maintain catheters?

Do they incorporate information from the latest HICPAC Guidelines (2009)?

Do they address patients admitted to the hospital with an indwelling catheter?

Do you have any algorithms/criteria to assist in determining the appropriate device for patients requiring a urinary catheter (e.g., size, bag vs. meter, etc.)?

# Foley Observation Survey



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# Product Utilization

- 5.7% were temp sensing Foleys
- 45% had standard Foley bag systems
- 49% had urine meter systems
- 6% were not identified as to a standard or urine meter bag



# Training and Education Questions

- Do you have an educational program on use of urinary catheters?
  - If yes, is training provided:
    - At initial employment?
    - Annually?
    - During periodic skills fairs?
- Do you have a method for assessing knowledge level of use/maintenance of urinary catheters?
  - If yes, does assessment include:
    - Direct observation?
    - Written testing?
- Do you have an educational program on catheter-associated urinary tract infections (CAUTIs)
  - If yes, is training provided:
    - At initial employment?
    - Annually?
    - During periodic skills fairs?
- During periodic skills fairs?

# Urinary Catheter Utilization Team Questions

- Do you have a quality improvement (QI) program in place for CAUTIs? If yes:
  - Has a CAUTI Task Force been developed?
  - Are direct-care providers involved/engaged in CAUTI QI program activities?
- Has a CAUTI prevention bundle been developed?
  - If yes, do you currently monitor UTI bundle compliance?
- Have you implemented programs to reduce dwell time of indwelling urinary catheters? If yes, do they include:
  - Automatic stop orders or Nurse-driven removal?
  - Daily assessment/documentation of need?
- Do you have a specific location in the medical record where the presence of a Foley catheter is documented?
- Do you routinely monitor hand hygiene compliance in association with insertion and/or management of urinary catheter systems?
- Have you been able to document a reduction in CAUTIs specifically related to QI programs?

# CAUTI Surveillance System?

- Is CAUTI surveillance currently conducted?
  - If yes, what type surveillance
  - Is the surveillance conducted house wide or targeted based on assessment of population?
  - Are standardized definitions used to define infection? (please specify)
  - Are McGeer definitions used in long-term care setting?
  - Is surveillance conducted continuously? If not, how frequently?
- Do you monitor the impact of cases that do not meet surveillance definition?
- Does the surveillance include multi-drug resistant organism information?
- Do you calculate CAUTI rates? If yes, what denominator is used?
- Do you report CAUTI surveillance findings to at least one hospital committee?
- Do you report CAUTI surveillance findings to direct-care providers? (e.g., surveillance unit staff)
- Do you conduct catheter practice rounds or surveys?
- Do you have a system to address/determine "present on admission" CAUTIs?
- Do you monitor compliance with Surgical Care Improvement Project (SCIP) Foley catheter initiatives?

# Product Utilization

- Do you have a protocol for selecting the appropriate Foley catheter for individual patients? (i.e., size, configuration, drainage system, etc.)
- Do you use pre-connected Foley trays to maintain a closed system?
- Do you have alternative devices to Foley catheters readily available (e.g., external catheters, intermittent catheters)?
- Do you have alternative methods to urinary catheters to assess bladder urine volume (e.g., bedside ultrasound)?
- Have you implemented the use of an anti-infective/anti-microbial Foley catheter?
- Do you have a catheter-stabilization device readily available?  
If yes, is it directly incorporated into the Foley tray system?

# References Bard Used for Project

- HICPAC, Guidelines for Prevention of Catheter-Associated Urinary Tract Infections 2009
- APIC Elimination Guide, Guide to the Elimination of Catheter-Associated Urinary Tract Infections (CAUTIs) 2008

# Results of the BARD Assessment Survey

We Created a Prevention of Catheter-Associated Urinary Tract Infections Training and Education

# CAUTI-Prevention Objectives

- To review the serious problem of catheter-associated urinary tract infections (CAUTI) throughout healthcare settings: hospitals, ambulatory and long-term care.
- To review CAUTI in the context of a CMS “Never Event” including the financial implications.
- To educate the healthcare team involved in the insertion, care and maintenance of urinary catheters about CAUTI prevention.

# Definitions, Impact and Background

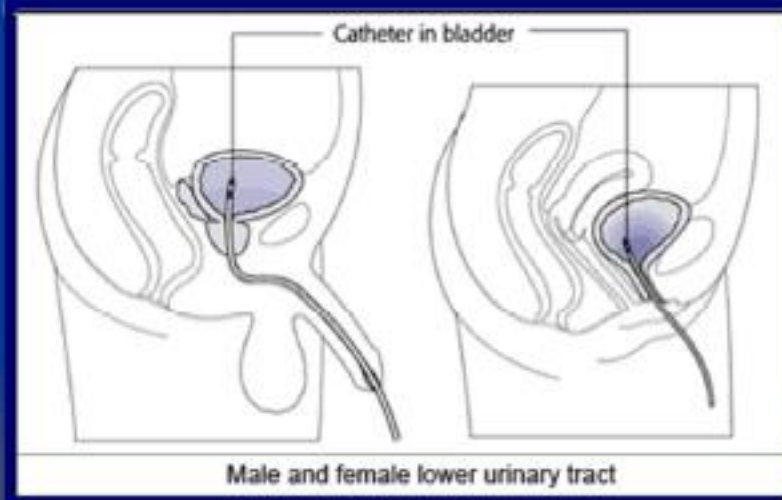
- A Catheter-Associated Urinary Tract Infection (CAUTI) is a UTI that occurs in a patient who had an indwelling urethral catheter in place within the 48 hour period before the onset of the UTI.
- An Indwelling Urinary Catheter is a drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and is connected to a closed collection system.
- Alternative Urinary Drainage Systems include:
  - Intermittent (in & out)
  - External (condom catheter)
  - Suprapubic-surgically inserted above the pubis.
- Alternative systems **are not part** of the CAUTI reporting system to the National Health Safety Network (NHSN).





# Definition: Indwelling Catheter

- A drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and is connected to a closed collection system
  - Also called a Foley catheter
  - Does not include straight in and out catheters or urinary catheters that are not placed in the urethra (ex. suprapubic catheter).



Gould, Carolyn. "Catheter-Associated Urinary Tract Infection (CAUTI) Toolkit." *CDC.gov*. Centers for Disease Control and Prevention, 2009. Web. 2011.

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# Epidemiology of CAUTIs

- CAUTIs are the most common type of healthcare-associated infection (CDC estimates >560,000 healthcare acquired UTIs annually).<sup>1</sup>
- CAUTIs account for more than 30% of HAIs reported by acute care hospitals.<sup>1</sup>
- Virtually all CAUTIs are caused by instrumentation of the urinary tract.<sup>1</sup>
- Major increase in morbidity and mortality (CDC estimates 13,000 attributable deaths annually).<sup>1</sup>
- Increases length of stay by 2-4 days<sup>2</sup> and increases cost (CDC reports \$0.4-0.5 billion per year).<sup>1</sup>

<sup>1</sup>United States of America. Department of Health and Human Services. Centers for Disease Control and Prevention. *Guideline for Prevention of Catheter-Associated Urinary Tract Infections 2009*. By Carolyn V. Gould, et al. Centers for Disease Control and Prevention, 2009. Web.

<sup>2</sup>Salgado, Cassandra D., Tobi B. Karchmer, and Barry M. Farr. "Prevention of Catheter-Associated Urinary Tract Infections." *Prevention and Control of Nosocomial Infections*. By Richard Putnam. Wenzel. Fourth ed. Baltimore (Md.): William & Wilkins, 1997. 297-311. Print.

# Impact and Background

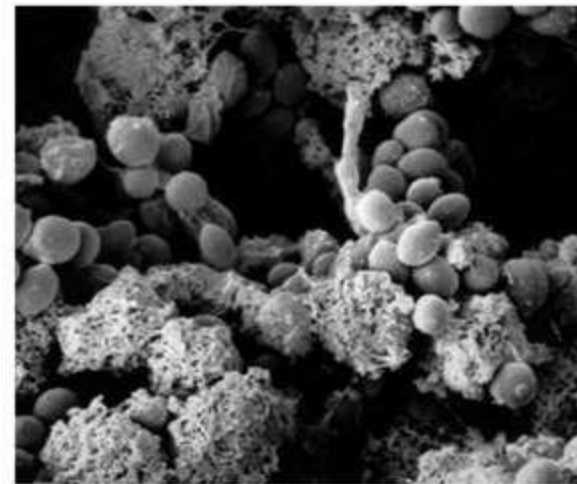
- 15% to 25% Hospitalized patients
- 5% to 10% Nursing Home Residents = 75,000-150,000 individuals
- Use of urinary catheters often inappropriate
  - In a recent U.S. hospital survey:>50% did not monitor use of urinary catheters
- 75% did not monitor duration and/or discontinuation of the catheters



Gould, Carolyn. "Catheter-Associated Urinary Tract Infection (CAUTI) Toolkit." *CDC.gov*. Centers for Disease Control and Prevention, 2009. Web. 2011.

# Sources of Microorganisms

- Endogenous: The flora already present in the patient's rectal or perineal area.<sup>1</sup>
- Exogenous: The contaminated hands of healthcare personnel during catheter insertion or manipulation of a urine collection system.<sup>1</sup>
- Contamination may occur by:
  - 1) Direct inoculation when inserting the catheter <sup>2</sup>
  - 2) Organisms ascending the external catheter surface<sup>2</sup>
  - 3) Reflux of contaminated urine in the drainage bag<sup>2</sup>
  - 4) Failure of closed drainage system lumen<sup>2</sup>

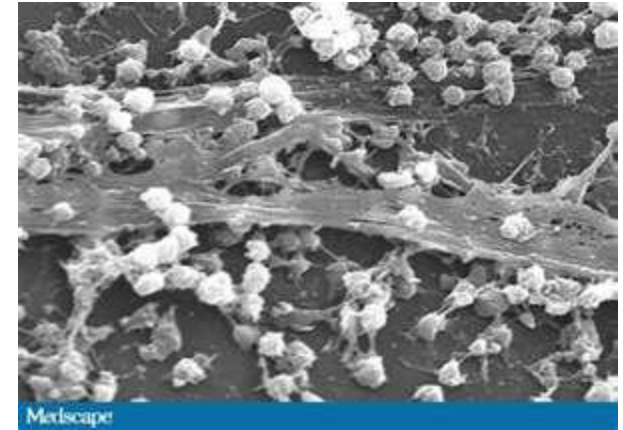


<sup>1</sup>Gould, Carolyn. "Catheter-Associated Urinary Tract Infection (CAUTI) Toolkit." *CDC.gov*. Centers for Disease Control and Prevention, 2009. Web. 2011.

<sup>2</sup>Maki, Dennis. "Engineering out the Risk of Infection with Urinary Catheters." *Emerging Infectious Diseases* 7.2 (2001): 342-47. Print.

# Biofilms on Urinary Catheters

- Formation of biofilms by urinary pathogens on the surfaces of catheters and urinary drainage bags<sup>1</sup>
- Bacteria within biofilms are resistant to antimicrobials and host defenses<sup>1</sup>
- Biofilms enhance the formation of encrustations around the catheter that can tear the urethra upon removal and cause a potential transient bacteremia as bacteria enter the bloodstream<sup>2</sup>



<sup>1</sup>Gould, Carolyn. "Catheter-Associated Urinary Tract Infection (CAUTI) Toolkit." *CDC.gov*. Centers for Disease Control and Prevention, 2009. Web. 2011.

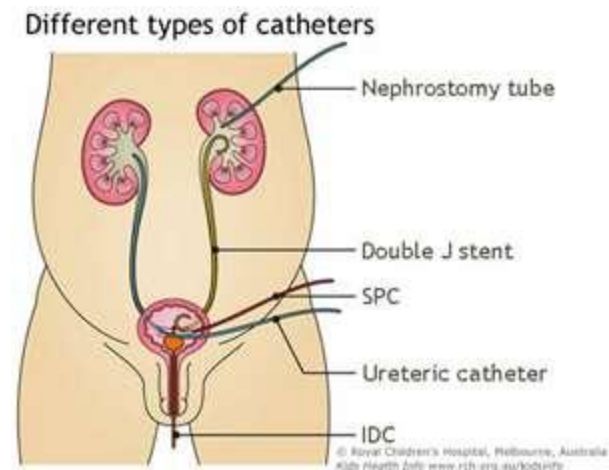
<sup>2</sup> Getliffe, Kathryn A., and Anne Ib. Mulhall. "The Encrustation of Indwelling Catheters." *British Journal of Urology* 67.4 (1991): 337-41. Print. 1205-30



# Core Prevention Strategies: High levels scientific evidence

Insert catheters only for appropriate indications :

- Acute urinary retention or bladder outlet obstruction
- Accurate urine output measurement in critically ill patient
- Perioperative use for select surgical procedures
- Healing of open sacral or perineal wounds with incontinence
- Prolonged immobilization required: potentially unstable spine, multiple trauma such as pelvic fracture
- End-of-life comfort, if needed



# Core Prevention Strategies

- 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



Gould, Carolyn. "Catheter-Associated Urinary Tract Infection (CAUTI) Toolkit." *CDC.gov*. Centers for Disease Control and Prevention, 2009. Web. 2011.

# Core Prevention Strategies



- 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.
- Ensure that only properly trained persons insert and maintain catheters
- Insert catheters using aseptic technique and sterile equipment
- (acute care setting)
  - Perform hand hygiene before and after insertion
  - Use sterile gloves, drape, sponges, antiseptic or sterile solution for periurethral cleaning, single-use lubricant
  - Properly secure catheters



# Core Prevention Strategies

- 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 pre-connected, sealed catheter-tubing junctions
- Obtain urine samples aseptically



# Core Prevention Strategies

- Maintain unobstructed urine flow
  - Keep catheter and collecting tube free from kinking – use the catheter tubing clip to avoid tubing stagnation of urine that can grow organisms
  - Keep collecting bag below level of bladder at all times (do not rest bag on floor)
  - Empty collecting bag regularly; never let more than 400 cc<sub>s</sub> of urine to collect in the bag.
  - Use a separate, clean container for each patient. Ensure drainage spigot does not contact non-sterile container



Gould, Carolyn. "Catheter-Associated Urinary Tract Infection (CAUTI) Toolkit." *CDC.gov*. Centers for Disease Control and Prevention, 2009. Web. 2011.

# Core Prevention Strategies

Audit Nursing practice for each of the core prevention strategies.

Urinary Catheter Observation Audit Tool					Floor/Nursing Care Unit		Survey Date					
Unit Census					Urinary Catheter Practice Survey (Yes/No) (Yes = Compliant)							
Room #	Bardex IC® Foley Catheter? Yes/No	Tray or Component	Temp Sensing Yes/No	Bag, Meter or Other	Urinary Catheter secured to body	Secured If Yes, Statlock® device (S), Tape (T) or Leg Strap (LS) If No: (N)	Tamper-evident Seal (TES) Intact	No Dependant Loop Observed	Drain Tubing and Bag Below Bladder	Bag/Meter Not Touching Floor	Bag/Meter Not Overfilled > 400 ml	Individual collection containers in BR
Do a manual count of devices and YES compliance for each column and show in appropriate boxes below. Use calculator to generate percent of total catheters.												
Number Observed with Foley Catheter	Bardex®/IC Foley Catheter Count	Tray Count	Temp-Sensing Count	Drain Bag Count	Secured = Yes	StatLock® device count	TES Intact = YES	(NO LOOP) Count of Yes (Compliant)	BELOW BLADDER Count of Yes (Compliant)	BAG OFF FLOOR Count of Yes (Compliant)	NO OVERFILL Count of Yes (Compliant)	
Percent												
Number	Non-Bardex®/IC Count	Component Count		Meter Count		Leg Strap Count						
Percent												
Number				Other Count		Tape Count						
Percent												

Bard Catheter Observation Study

Observer's Name & Credentials

# Hand Hygiene and Standard Precautions

## – Hand hygiene and Standard (or appropriate) Precautions

- Wash hands before catheterization
- Wash hands after touching catheter systems – especially after emptying a catheter bag
- Wear gloves when touching inner thighs, emptying catheter bag or arranging the tubing
- Wash or Sanitize hands after removing gloves



<sup>1</sup>Gould, Carolyn. "Catheter-Associated Urinary Tract Infection (CAUTI) Toolkit." *CDC.gov*. Centers for Disease Control and Prevention, 2009. Web. 2011.

<sup>2</sup>"Guide to Infection Prevention for Outpatient Settings: Minimum Expectations for Safe Care." *CDC.gov*. Centers for Disease Control and Prevention. Web. 17 May 2012. 1205-30

# Core Prevention Strategies:High

- Implement quality improvement programs to enhance appropriate use of indwelling catheters and reduce risk of CAUTI
  - Keep the catheter secure using the pre-package Bard device, a leg strap or a piece of tape
    - Keep slack in the catheter to minimize trauma
  - Alerts or reminders
  - Stop orders
  - Protocols for nurse-directed removal of unnecessary catheters
  - Guidelines/algorithms for appropriate perioperative catheter management

# Example of Urinary Catheter Protocol/Order Set Process Flow\*

- Daily at 0500am every patient will be evaluated for Foley catheter removal utilizing the **Urinary Catheter Removal Protocol/Order Set**
- The **Urinary Catheter Removal Protocol/Order Set** form will be implemented by the Nursing staff and maintained in the patient chart at all times.
- Removal of the Foley catheter will not occur until after morning rounds to allow adequate time for communication between physicians and nursing; unless otherwise ordered by the physician.
- It is imperative for the **MD/PA/ANP to sign and date the Urinary Catheter Protocol/Order Set EACH DAY.**
- There must be documentation in the medical record on POD 1 or POD 2 for a reason or plan to continue the urinary catheter. (A physician order to keep catheter, alone, is not sufficient. Example: “Keep catheter.”) There must be documentation such as “Continue catheter, patient is on total bed rest.”

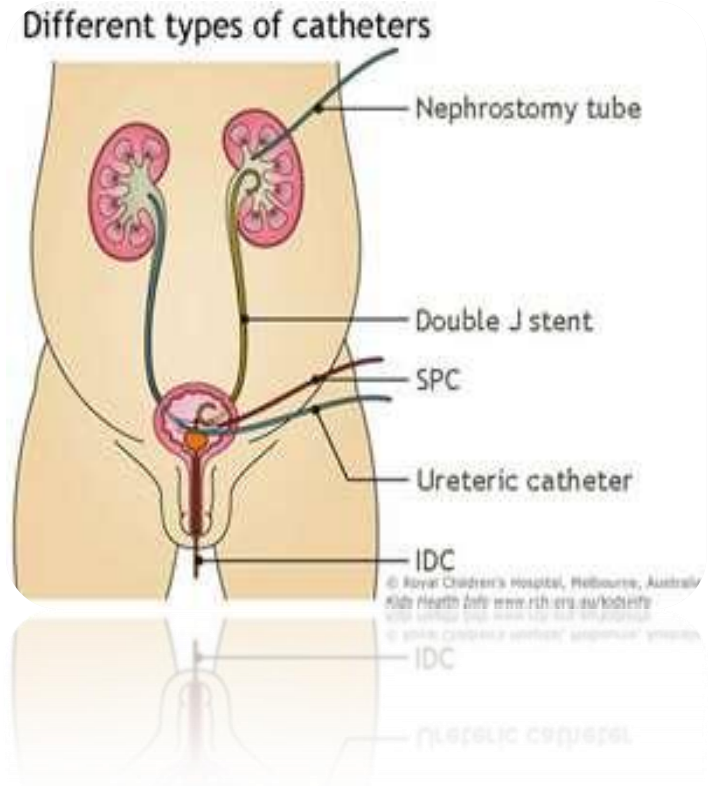
\*Courtesy of Wellington Medical Center, Willington, FL

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# Supplemental Strategies

- Consider alternatives to indwelling urinary catheters (intermittent, external condom catheters)
- Consider portable ultrasound devices for assessing urine volume to reduce unnecessary catheterizations
- Consider antimicrobial or antiseptic-impregnated catheters (first, ensure there is compliance with core prevention strategies)



Gould, Carolyn. "Catheter-Associated Urinary Tract Infection (CAUTI) Toolkit." *CDC.gov*. Centers for Disease Control and Prevention, 2009. Web. 2011.

# Supplemental Strategies

- Consider silver-coated catheters
  - Decreased risk of bacteriuria compared to standard latex catheters in a meta analysis of randomized clinical trials
  - Significant differences for silver alloy, but not silver oxide-coated catheters
  - Effect greater for patients catheterized < 1 week
  - Mixed results in observational studies in hospitalized patients



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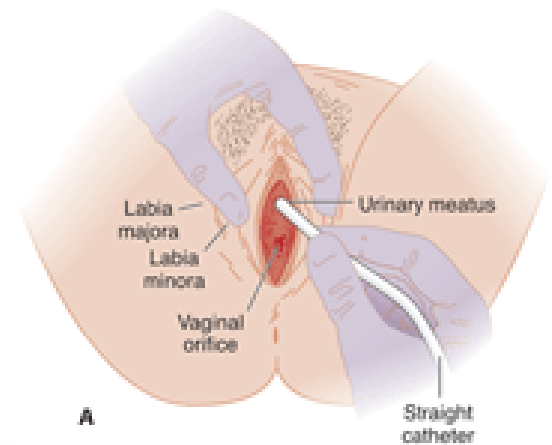
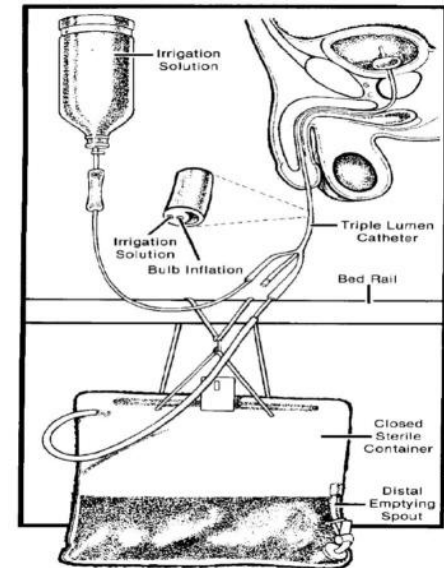
# Selective Use Strategy: Nursing Unit Limited Stock

- Rationale:
- Any patient receiving a Foley catheter is at risk for developing a CAUTI; however, patients who are expected to be catheterized for less than 24 hours are thought to be at decreased risk of developing such an infection
- Use Protocol:
- Patients expected to be catheterized for less than 24 hours should receive a standard Foley catheter. All or most of the patients in certain nursing units are expected to be catheterized for less than 24 hours; therefore standard non-silver-coated catheters should be used:
  - Outpatient Areas and/or Clinics
  - Same Day Surgery
  - Obstetrics/Labor and Delivery

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# 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 on a routine daily basis – **no evidence to support a reduction in CAUTIs**



Gould, Carolyn. "Catheter-Associated Urinary Tract Infection (CAUTI) Toolkit." *CDC.gov*. Centers for Disease Control and Prevention, 2009. Web. 2011.

# Strategies NOT recommended for CAUTI prevention

- Irrigation of bladder with antimicrobials
- Installation of antiseptic or antimicrobial solutions into drainage bags
- Routine screening for asymptomatic bacteriuria(ASB)

# Additional References

- Centers for Disease Control and Prevention
- The Joint Commission
- Centers for Medicare and Medicaid Services
- Health and Human Services
- National Quality Forum