

# Reducing Urinary Catheter-Associated Morbidity

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# Agenda

- Defining the problem
- Quality measures and CAUTIs
- Prevention strategies

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# Healthcare-Associated Infections (HAI)

- 20-70% preventable
- Most common HAI is UTI (40%)
- Most UTIs associated with urinary catheters (CAUTIs)
- ~ 25% of inpatients have indwelling urinary catheters
- 5-10% of long-term care patients have indwelling urinary catheters

# Catheter-Associated UTIs (CAUTI)

- Urethral catheter in place at time of or within 48 hrs prior to specimen collection
- Uropathogen  $\geq 10^5$  cfu/ml
- Symptomatic infection
- Asymptomatic UTI bacteremia

# Catheter-Associated UTIs (CAUTI)

- Bacteriuria rate  $\sim 5\%$ /day
  - 10% will develop symptomatic UTI
  - $> 560,000$  nosocomial UTIs
  - 3% will develop bacteremia
  - $\sim 13,000$  CAUTI deaths in US annually
- Direct medical costs
  - \$600, increased LOS 0.5-1.0 days per symptomatic UTI
  - \$3,000 per bacteremic episode

# Bacterial Prevalence in CAUTIs

|                          | CAUTI                              |  | UTI  |                |
|--------------------------|------------------------------------|--|--|----------------|
|                          | NHSN 2006-2007<br>(9,377 isolates) |  | Calgary Laboratory Services<br>2004-2005 (42,785 isolates) |                |
|                          | Hospital                           |  | Hospital   | Long-term care |
| <i>Enterococcus sp.</i>  | 14.9                               |  | 8.0  | 11.4           |
| <i>E. coli</i>           | 21.4                               |  | 65.5   | 49.6           |
| <i>Klebsiella sp.</i>    | 8.6                                |  | 9.4  | 8.6            |
| <i>Proteus mirabilis</i> | NR                                 |  | 2.2  | 10.1           |
| <i>P. aeruginosa</i>     | 10.0                               |  | 1.8  | 3.2            |
| Yeast                    | 21.0                               |  | 1.8  | 0.8            |
| Other                    | 14.1                               |  | NR   | NR             |

Adapted from Church D, et al., unpublished data, Hidron A, et al. Infect Control Hosp Epidem 2009

# Bacterial Resistance in CAUTIs

| NHSN 2006-2007<br>(9,377 isolates) |      |
|------------------------------------|------|
| <i>E. coli</i>                     |      |
| Fluoroquinolones                   | 24.8 |
| Cephalosporins                     | 5.5  |
| “Penems”                           | 4.0  |
| <i>P. aeruginosa</i>               |      |
| Fluoroquinolones                   | 33.8 |
| Zosyn                              | 17.1 |
| “Penems”                           | 25.1 |



# Sources of CAUTIs

- Inappropriate indication
- Inappropriate technique
  - Procedural teaching inadequate
  - Foley kits
- Inappropriate retention

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# Indwelling Urinary Catheters

- Appropriate indications
  - Immediate postoperative care
  - Bladder outlet obstruction/retention
  - Incontinence and sacral wound
  - Closely monitor urine output
    - Postsurgical
  - Prolonged immobilization
  - End of life care

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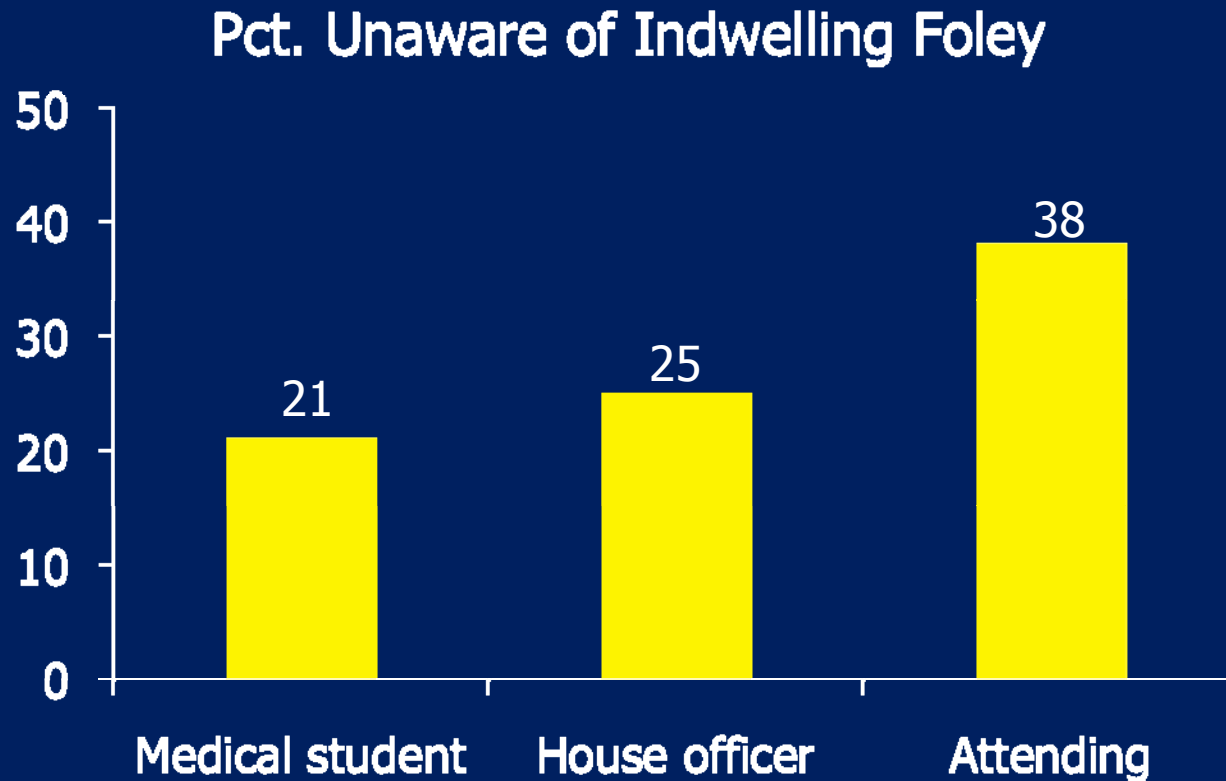
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# Awareness of Indwelling Urinary Catheter



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- **Quality measures and CAUTIs**
- Prevention strategies

# Quality Measures and CAUTIs

- Medicare
  - Inpatient Prospective Payment System (IPSS)
  - No payment for 10 HAIs including CAUTIs
- Surgical Care Improvement Project (SCIP)
  - Hospital Inpatient Quality Reporting Program
  - Measure 9: catheters out POD 1-2
- CDC National Healthcare Safety Network
  - 25% reduction in CAUTIs by 2013

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- Defining the problem
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- **Prevention strategies**

# Risk Factors for CAUTI

- Female sex
  - Older age
  - Impaired immunity
  - Prolonged catheterization
- } Immutable

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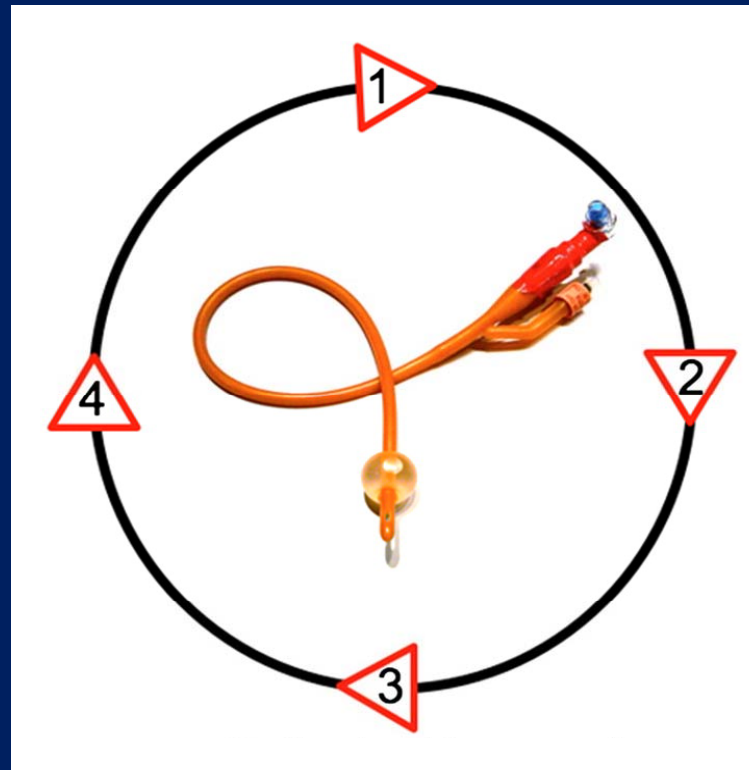
# Barriers to CAUTI Prevention Programs

- Perception of importance of CAUTIs
  - “Not a huge source of morbidity”
- Convenience of urinary catheters
  - “Get through my shift” mentality
- Lack of clinical champion
  - > 50% of hospitals do not monitor which patients are catheterized
  - 75% do not monitor duration of catheterization

# Hallmarks of CAUTI Prevention

Appropriate catheters  
Proper insertion

Reinsertion



Catheter care  
Hand hygiene

Removal

Meddings J, et al. Clin Infect Dis 2011

[http://www.cdc.gov/hicpac/cauti/001\\_cauti.html](http://www.cdc.gov/hicpac/cauti/001_cauti.html)



# Limitations of Indwelling Urinary Catheters

- 42% uncomfortable
- 48% painful
- 61% limited ADLs

# CAUTI Prevention strategies

- Avoidance
- Stop orders
- Clinical reminders
- MD or RN clinical champion
- Alternative catheters

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# CAUTI Prevention strategies

- Systematic review of successful early removal protocols
  - 14 studies
  - Stop orders and reminders most effective
  - Associated with reduction in catheter days without increasing rates of reinsertion
  - Significant reduction in CAUTIs

# CAUTI Prevention strategies

- Avoidance
- Stop orders
- Clinical reminders
- MD or RN clinical champion
- Alternative catheters

# Identifying Clinical CAUTI Champions

- Different solutions at different hospitals
- Different solutions within different units within hospitals
- Education, implementation, monitoring
- Focus – insertion, timely removal
- MD-directed or activate RN-directed removal

# Identifying Clinical CAUTI Champions

**P**atient assessment for use

**C**losed system

**R**equires aseptic insertion

**A**septic management

**E**valuate need daily

**U**niversal precautions

**V**eto opening the system

**T**ie catheter to body

**E**arly removal

**I**ndications for use

**N**o obstructions to urine flow

**O**bstruction free

**T**ape or secure leg fixture

**N**o dependent loops



## Catheter Don'ts

- Routine antibiotic prophylaxis
- Antiseptic cleaning of urethral meatus
- Bladder irrigation
- Drainage bag irrigation
- Screening for asymptomatic bacteriuria

## 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.htm](http://www.cdc.gov/hicpac/cauti/001_cauti.htm)

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# CAUTI Prevention strategies

- Avoidance
- Stop orders
- Clinical reminders
- MD or RN clinical champion
- **Alternative catheters**

# Alternative catheters

- Prevent biofilm formation
  - Antibiotic impregnated
  - Silver coated
- Cochrane review of 23 studies, > 5,000 patients
  - Weak evidence of benefit

# Alternatives to Indwelling Urinary Catheters

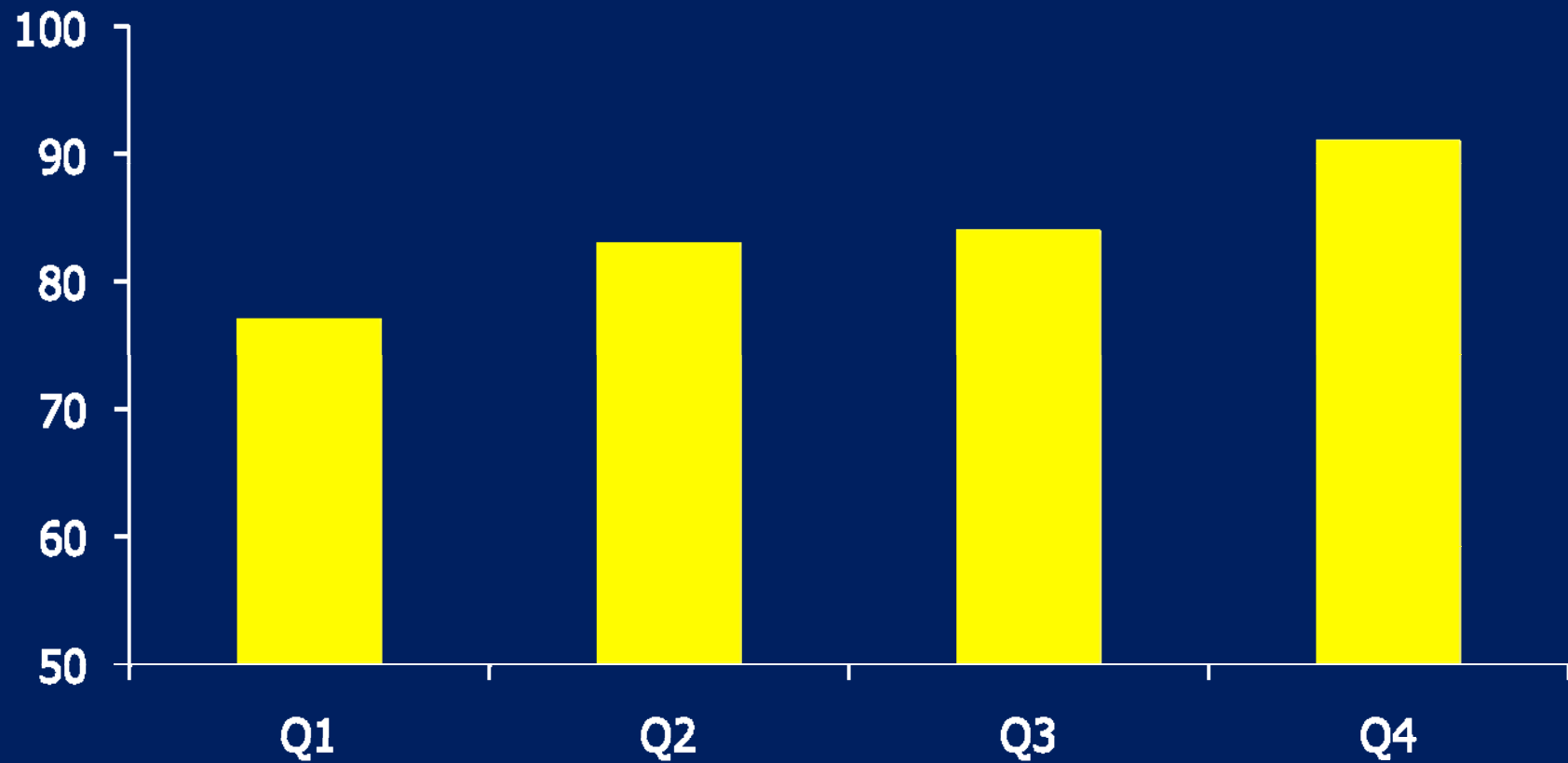
- Condom catheters
- Intermittent catheterization
- Bladder scan protocol

# Initiatives in WA

- Puget Sound VAMC
  - Foley bag reminder
  - EMR automated stop order
  - Daily justification of Foley retention

# Initiatives in WA

## VISN 20



# Conclusions

- CAUTIs a large health care burden
- Many are preventable
- Area of interest to policy-makers
- Simple solutions
- Require concerted effort of local clinical champions
  - Avoid unnecessary catheters
  - Stigmatize retention of “necessary” catheters