

# URINARY CONSIDERATIONS IN THE OLDER ADULT

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## Urinary Considerations in the Older Adult

- You receive a call from the daughter of one of your patients. The daughter has concerns that her 84 yr old mother with dementia (moderate) is acting different than usual. She has been resistant to care and has reduced oral intake. She denies any pain with urination, fever or chills. The daughter states that her mother's urine has been darker than usual and has a pungent odor to it.

## Urinary Considerations in the Older Adult

- She requests urine studies be ordered because, “anytime my mother was acting different we took her to the ER and they always diagnosed her with an Urinary Tract Infection.”

## Urinary Considerations in the Older Adult

- Does she have an Urinary Tract Infection (UTI)?
- How can we accurately describe this clinical scenario?
- What are other potential causes for this acute change in condition?
- What do we tell the daughter?

## Urinary Considerations in the Older Adult

### • Objectives

- Understand definitions of common urological conditions
- Identify risk factors for urological pathology of the older adult
- Know available diagnostic criteria for UTI
- Review evidence based UTI prevention techniques

## Urinary Considerations in the Older Adult

### • Common Terminology

- Asymptomatic Bacteriuria = Isolation of bacteria found in urine in a person without symptoms or signs to acute infection
- Pyuria – Inflammatory cells within the urine
- Asymptomatic Bacteriuria with pyuria is not an indication for antibiotic treatment (Nicolle, et al. ISDA 2005.)

Population	Prevalence, %
Healthy, premenopausal women	1.0–5.0
Pregnant women	1.9–9.5
Postmenopausal women aged 50–70 years	2.8–8.6
Diabetic patients	
Women	9.0–27
Men	0.7–11
Elderly persons in the community <sup>a</sup>	
Women	10.8–16
Men	3.6–19
Elderly persons in a long-term care facility	
Women	25–50
Men	15–40
Patients with spinal cord injuries	
Intermittent catheter use	23–89
Sphincterotomy and condom catheter in place	57
Patients undergoing hemodialysis	28
Patients with indwelling catheter use	
Short-term	9–23
Long-term	100

Nicolle, et al. CID 2005;40

<sup>a</sup> Age, ≥70 years.

## Urinary Considerations in the Older Adult

- Urinary Tract Infection (UTI) = Infection within the urinary system that produces symptoms
  - Classic Symptoms – Dysuria, frequency or urgency

Odor – not found to be predictive (Little 2010, Midhun 2004)

## Urinary Considerations in the Older Adult

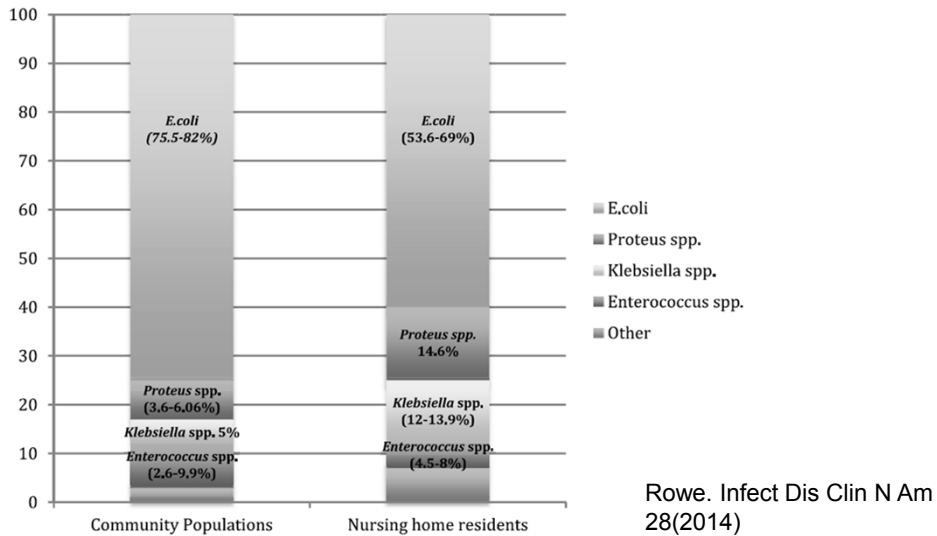
### UTIs

- Anatomic
  - Cystitis – Infection confined in the bladder
    - Cystitis = UTI
    - UTI  $\neq$  Cystitis
  - Pyelonephritis – Infection affecting the kidney
- Syndromic
  - Uncomplicated – Premenopausal, non-pregnant, females without known anatomical anomaly
  - Complicated – Everyone else

## Urinary Considerations in the Older Adult

- Urine Dipsticks
  - Leukocyte Esterase
    - Enzyme produced by WBCs
  - Nitrate Reductase
    - Some (NOT ALL) bacteria convert urinary nitrate to nitrite
    - Enterobacteriaceae (E. coli, Klebsiella, Proteus)

## Urinary Considerations in the Older Adult



The most common organisms isolated from urinary cultures in older adults.

## Urinary Considerations in the Older Adult

- Urinary system changes associated with aging
  - Reduction in kidney size
  - Reduction in filtration rate
  - Vaginal atrophy
  - Reduction in pH balance
  - Prostate hypertrophy
  - Prolapse
  - Incontinence
  - Urinary retention

## Urinary Considerations in the Older Adult

### Vaginal pH

- Lactobacilli maintain the acidic balance
- Less common in menopausal women
- Alkaline environment promotes colonization with uropathogens

## Urinary Considerations in the Older Adult

- Prostate hypertrophy
  - Urethral obstruction and turbulent urine flow – ascension of uropathogens
  - May lead to catheterization
  - Incidence of infection 3-7% per day
- Voiding is the most important defense against infection

## Urinary Considerations in the Older Adult

- Incontinence
  - Unlikely causative
  - Many conditions promote incontinence
    - Cystoceles
    - Diverticuli
    - Cognitive impairment
    - Stroke
    - Parkinson's
    - Spinal injury

## Urinary Considerations in the Older Adult

### Diagnostic tools for UTIs

- Strongest predictor is history
- Community dwelling
  - Lower Urinary Tract Symptoms (LUTS)
    - Frequency
    - Urgency
    - Dysuria
    - Nocturia
    - Suprapubic discomfort
    - Hematuria
- 1 or more symptom above without vaginal discharge (90% probability)

Gupta, et al. ISDA.  
2012



## Urinary Considerations in the Older Adult

- Institutionalized adult
  - Higher prevalence of asymptomatic bacteriuria
  - Multiple co-morbidities
  - Communication deficits

## Urinary Considerations in the Older Adult

- McGeer Criteria was developed in 1991
  - Society for Healthcare Epidemiology of America
  - Centers for Medicare and Medicaid Services

At Least 3 of the Following

- Fever (38C) or chills
- New or increased burning pain on urination, frequency, or urgency
- New flank pain or suprapubic pain or tenderness
- Change in character of urine
- Worsening mental or functional status

## Urinary Considerations in the Older Adult

- Loeb – minimum criteria to initiate antibiotics
- Acute dysuria alone or
- Fever ( $>37.9^{\circ}\text{C}$  or  $1.5^{\circ}\text{C}$  increase above baseline temperature) and at least 1 of the following:
  - New or worsening
  - Urgency
  - Frequency
  - Suprapubic pain
  - Gross hematuria
  - Costovertebral tenderness
  - Urinary incontinence

## Urinary Considerations in the Older Adult

- Although accepted by regulatory agencies, adherence was low
- Low incidence of localizing symptoms
  - Up to 75% still receive antibiotics
- In 2012 McGeer's Criteria was revised

At least 1 of the following subcriteria of signs or symptoms

Acute dysuria or acute pain, swelling, or tenderness of the testes, epididymis, or prostate

Or

Fever or leukocytosis and at least 1 of the following : In the absence of fever or leukocytosis, then 2 or more of the following

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Acute costovertebral angle pain or tenderness</li> <li>• Suprapubic pain</li> <li>• Gross hematuria</li> <li>• New or marked increase in incontinence, urgency, or frequency</li> </ul> | <ul style="list-style-type: none"> <li>• Suprapubic pain</li> <li>• Gross hematuria</li> <li>• New or marked increase in incontinence, urgency, or frequency</li> </ul> |
|--|---|

## Urinary Considerations in the Older Adult

One of the following microbiological subcriteria

- At least  $10^5$  cfu/mL of no more than 2 species of microorganisms in a voided urine sample
- At least  $10^2$  of any number of organisms in a specimen collected by in-and-out catheter

## Urinary Considerations in the Older Adult

- What about the older adult with dementia, communication difficulties or uncharacteristic history?
- Altered Mental Status most common reason urine studies are ordered
- Knowing our prevalence of asymptomatic bacteriuria a systematic approach needs to be taken

## Urinary Considerations in the Older Adult

- Causes for Atypical Presentation of Disease
  - Pain
  - Sleep
  - Environment
  - Constipation
  - Alternative infection
  - Dehydration
  - Glucose
  - Medication

## Urinary Considerations in the Older Adult

- Treatment Options with intact renal function (ISDA 2012)

TMP/SMX 160/800 one tablet twice daily 3 days

Nitrofurantoin 100mg twice a day 5 days

Fosfomycin 3g single dose (maybe inferior compared to other regimens)

## Urinary Considerations in the Older Adult

- Prevention Strategies
- Mobility
- Cranberry
- Pro-biotic
- Estrogen
- Antibiotic

## Urinary Considerations in the Older Adult

- Mobility
  - Reduction shown to increase risk for hospitalization for UTI
  - Maintain independent walking or improvement reduced hospitalization by 53%

## Urinary Considerations in the Older Adult

- Cranberry
  - Proanthocyanidin (PAC)
  - Inhibit adherence of E. coli to the bladder wall
  - 36mg of PAC can reduce bacteriuria and pyruia\*
  - Tolerance to pure cranberry is low

**Effect of Cranberry Capsules on Bacteriuria Plus Pyuria Among Older Women in Nursing Homes: A Randomized Clinical Trial**

*JAMA*. 2016;316(18):1879-1887. doi:10.1001/jama.2016.16141

## Urinary Considerations in the Older Adult

- Probiotics

- Studies when compared to antibiotics

**Lactobacilli vs Antibiotics to Prevent Urinary Tract Infections** A Randomized, Double-blind, Noninferiority Trial in Postmenopausal Women

*Arch Intern Med.* 2012;172(9):704-712.

doi:10.1001/archinternmed.2012.777

## Urinary Considerations in the Older Adult

- Vaginal Estrogen

- Helps restore lactobacillus flora and vaginal pH
- No evidence of reducing UTIs
- May help vaginitis symptoms associated with atrophy

## Urinary Considerations in the Older Adult

- Antibiotics

- Has shown to reduce UTIs when compared to Cranberry, Probiotics and estrogen
- Heavy cost of multi-drug resistance, adverse drug reactions

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