URINARY TRACT INFECTIONS IN THE ELDERLY

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DISCLAIMER

- The views and opinions expressed in this lecture are those of this speaker and do not reflect the official policy or position of any agency of the U.S. government

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OBJECTIVES

- Differentiate between asymptomatic bacteriuria and UTI
- Understand risks associated with use of indwelling urinary (foley) catheters
- Learn geriatric "pearls" in identifying, preventing and treating UTIs in elderly
- Review antibiotic treatment guidelines for UTIs in elderly
- Discuss techniques in preventing both complicated and uncomplicated UTIs in elderly

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UTI EPIDEMIOLOGY IN NURSING HOMES

- Primary cause of bacteremia
- Symptomatic: 10%
- Asymptomatic: 30% F/10% M
- Public reporting of catheter use rates

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PHYSIOLOGIC RISK FACTORS FOR UTIS IN THE ELDERLY (1)

- Physiologic changes of the bladder with aging:
  - Women
  - Men

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PHYSIOLOGIC RISK FACTORS FOR UTIS IN THE ELDERLY (1)

Physiologic changes of bladder with aging:

Women: Elevation of vaginal pH due to estrogen deficiency

- results in increased ability of bacteria to adhere to the mucosal cells of the bladder.

Men: Decreased bactericidal activity of prostatic secretions
Increased post-void residual volume of urine
- Cystocele/rectocele
- Prostate hypertrophy
- Neurogenic bladder from comorbidity

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ENVIRONMENTAL RISK FACTORS FOR UTI IN THE ELDERLY

Environmental Risk Factors

- Indwelling urinary catheters
- Congregate living
- Mechanical/chemical restraints
- Increased exposure to antibiotics
- Poor infection control techniques

The more impaired or frail the greater the risk of UTI!

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PHYSIOLOGIC RISK FACTORS FOR UTIS IN THE ELDERLY (2)

Functional / Cognitive Impairment

- Decrease self care
- Decrease cues to void
- Increased incontinence and perineal soiling
- Difficulty finding bathroom / suitable location to void

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RISK FACTORS FOR CAUTI

- Urinary stasis- no below the bladder drainage
- Over-distention and pyelonephritis– kinks with backflow
- Urethral trauma – catheter tugging
- Improper handling of urine collection bag
- Duration of catheter use – biofilm buildup
  - 5% risk per day of catherization, >30 days universal asymptomatic bacteriuria

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CDC NHSN UTI DEFINITIONS

- Urinary Tract Infection (UTI)/Cystitis
  - infection of the bladder (lower urinary tract).
- Pyelonephritis –
  - infection of the upper urinary tract (ureters / renal collecting system / kidneys).
- "Mixed flora" is not considered an organism and cannot be reported.
- Yeast **cannot** be reported as an organism for a UTI.

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DIAGNOSTIC DILEMMAS FOR OLDER ADULTS WITH UTI

- Common symptoms
- Atypical symptoms
- Fever?
- Getting the history

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EVALUATION OF POSSIBLE UTI

- Vital signs
- Fever!?
- History and examination
- U/A and C&S ***BEFORE*** starting antibiotics
- Clean catch vs I&O catheterization.

"Pyuria2011" by James Heilman, MD - Own work. Licensed under CC BY-SA 3.0 via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:Pyuria2011.JPG#mediaviewer/File:Pyuria2011.JPG

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DIPSTICK URINALYSIS

- Leukocyte esterase positive (pyuria)
  Leukocyte positive: 50–75% specific; 80-90% sensitive
- Nitrites: positive (bacteriuria)
- Protein: small amount may be present
- Blood: small amount may be present

**Pyuria alone not an indication for treatment.

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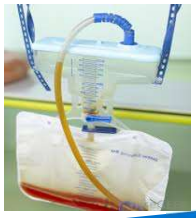
HEMATURIA

- Not common with UTIs in older adults.
- Frank hematuria should be evaluated promptly!
- Causes:
  - Stones
  - Cancer
  - Trauma
  - **infection**
  - hemorrhage.



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MICROBIOLOGY OF UTI

- 80% are caused by **gram negative bacilli**
  - E.coli, Klebsiella, Enterobacter, Proteus, and Serratia
  - Gram positive bacilli - Staphylococcus

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INDWELLING CATHETER-ASSOCIATED UTI (CAUTI)

- Catheter colonization and infection is inevitable and expected!
- Once bacteria colonizes urine, concentration is 100,000 colonies within 72 hours!!

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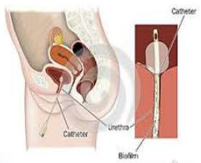
MECHANISMS OF COLONIZATION

- **Colonic and perineal flora primary source**
- Extra-luminal-- women – shorter urethra
- Manipulation of the collection system
- From hands of personnel during insertion
- Ascending from drainage bag/junction



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URINE CULTURE

- Gold STANDARD to guide appropriate treatment
- Results : >100,000 colonies of one species
- Treatment can be delayed until culture results available.
- Positive culture (bacteriuria) alone **not** a reason to treat.

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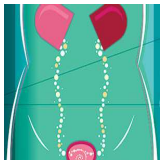
TREATMENT /NO TREATMENT

- Asymptomatic bacteriuria should **NOT** be treated.
- Routine or post-treatment screening for bacteriuria is not recommended. (Infectious Diseases Society of America)
- No benefits in decreasing rates of subsequent UTIs
- Increased risk of resistance and uropathogens



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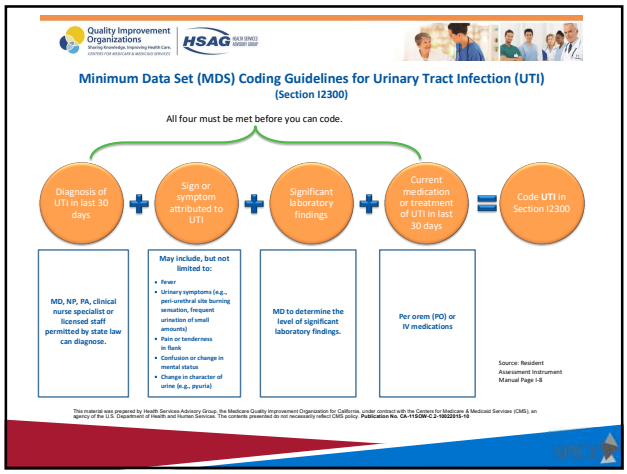

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CMS UTI ANTIBIOTIC TREATMENT

Minimum criteria for initiating antibiotics for UTI

NO indwelling catheter, include:

1. acute dysuria alone or fever (>37.9ºC [100ºF] or 1.5ºC [2.4ºF] increase above baseline temperature) and at least one of the following:

- new or worsening urgency, frequency, suprapubic pain, gross hematuria, costovertebral angle tenderness, or urinary incontinence.

Reference - "Development of Minimum Criteria for the Initiation of Antibiotics in Residents of Long-Term–Care Facilities: Results of a Consensus Conference" - Infect Control Hosp Epidemiol 2001;22:120-124.

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CMS UTI ANTIBIOTIC TREATMENT

Minimum criteria for initiating antibiotics for UTI

2. **Chronic indwelling catheter** (indwelling Foley catheter or a suprapubic catheter), includes the presence of at least one of the following:

- fever (>37.9ºC [100ºF] or 1.5ºC [2.4ºF] increase above baseline temperature),
- new costovertebral tenderness, rigors (shaking chills) with or without identified cause, or new onset of delirium."

- *Reference - "Development of Minimum Criteria for the Initiation of Antibiotics in Residents of Long-Term–Care Facilities: Results of a Consensus Conference" - Infect Control Hosp Epidemiol 2001;22:120-124.*

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INTERMITTENT CATHETERIZATION

- Intermittent catheterization can often manage overflow incontinence effectively.
- New onset incontinence from a transient, hypotonic/atonic bladder (usually seen following indwelling catheterization in the hospital) may benefit from intermittent bladder catheterization until the bladder tone returns (e.g., up to approximately 7 days).
- A voiding trial and post void residual can help identify when bladder tone has returned.

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APPROPRIATE USE OF URINARY CATHETERS

- Clinical criteria for long/short for indwelling catheter:
  - Obstruction
  - Neurogenic bladder
  - Hematuria (short term)
  - Wounds stage 3 or >
  - Aggressive diuresis / monitoring of strict I/O (short term)
  - Terminally ill for comfort measures
- Develop policies for independent nursing removal and education on technique for placement and management of device and collecting bag
- CDC HICPAC Guidelines for Prevention of Catheter-Associated Urinary Tract Infections, 2009.

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INAPPROPRIATE USE OF URINARY CATHETERS

- Used for the convenience of nursing staff.
- Used in lieu of other bladder management strategies.
- Used for specimen collection when the resident can voluntarily void
- Catheter left in place when removal is indicated.

(Indwelling catheters are associated with a 5% risk/day)

CDC HICPAC Guidelines for Prevention of Catheter Associated Urinary Tract Infections 2009

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NURSING HOME ANTIMICROBIAL STEWARDSHIP GUIDE

AHRQ Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

Provides toolkits to help nursing homes optimize their use of antibiotics. https://www.ahrq.gov/nhguide/index.html

SPICE

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PREVENTION OF UTIS

- Hand Hygiene – both residents and staff
- Adequate hydration – 30cc/kg of body weight/day
- Perineal hygiene after toileting
- Routine toileting
- *Removing urinary catheter as early as possible.*

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PREVENTION CATHETER-ASSOCIATED UTI (1)

- Catheter used for appropriate indications.
- Urinary catheter duration of use minimized.
  Increase of 5% risk per day!

- Hand hygiene before and after insertion of catheter and during any manipulation.
- Only properly trained persons for insertion using aseptic technique.

CDC HICPAC Guidelines for Prevention of Catheter Associated Urinary Tract Infections 2009

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PREVENTION OF CATHETER-ASSOCIATED UTI(2)

CDC HICPAC GUIDELINES FOR PREVENTION OF CATHETER ASSOCIATED URINARY TRACT INFECTIONS 2009

- Clean technique for intermittent catheterization.
- Standard Precautions during catheter manipulation.
- Periurethral cleaning with antiseptics not recommended. Routine hygiene recommended.
- Routine use of antimicrobial/antiseptic-impregnated catheters not recommended.

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PREVENTION OF CATHETER-ASSOCIATED UTI(3)

CDC HICPAC GUIDELINES FOR PREVENTION OF CATHETER ASSOCIATED URINARY TRACT INFECTIONS 2009

- No routine schedule for catheter replacement (e.g. monthly)
- Urine samples obtained aseptically.

Note: Before urine samples for culture are obtained from resident with a catheter in place > 14 days, catheter should be replaced and specimen obtained from new catheter.

If obstruction or infection occurs - change the catheter.

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CDC GUIDELINES ON FLUSHING AND IRRIGATION

- If obstruction or infection occurs - change the catheter.

"Unless obstruction is anticipated (e.g., as might occur with bleeding after prostatic or bladder surgery) bladder irrigation is not recommended...If obstruction is anticipated, closed continuous irrigation is suggested to prevent obstruction."

- *"Q2C.3. Bladder irrigation*

Low-quality evidence suggested no benefit of bladder irrigation in patients with indwelling or intermittent catheters.

www.cdc.gov/infectioncontrol/pdf/guidelines/...

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PROPHYLAXIS FOR UTI PREVENTION

- Cranberry juice/extract – currently not enough evidence to recommend for or against use. Cochrane guidelines found no strong evidence for recommending use in prophylaxis (2012).

- Oral Estrogens **not** shown to be beneficial.
- Topical, vaginally applied estrogens have been shown to be effective in smaller studies (sample was post-menopausal).

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CASES

- 84 yo F with dementia appears more fatigued and confused this morning. There are no other symptoms. Her vital signs are stable and she is afebrile.
- What do you do?

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CASES

- An 87 yo male is admitted after a hip fracture. The hospital team was unable to remove his foley successfully and he is coming to you with a foley in place. At what point would a trial of void be appropriate?

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CASES

- A urinalysis was obtained for a resident on a Friday afternoon and a culture is pending. You are working on Saturday and the results return, showing the following:
  - Leukocyte esterase +
  - Nitrites –
  - Trace blood
- What do you do?

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UNC UTI PREVENTION VIDEO

- From the Nursing Home Infection Prevention Courses by The University of North Carolina at Chapel Hill develop by SPICE.
- Infection Prevention in Nursing Homes Video for staff training.
- https://www.coursera.org/learn/infection-prevention/lecture/ugBjg/infection-prevention-in-nursing-homes-introduction

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SUMMARY OF UTI/CAUTI

- Prevent Infection – ensure good practices to prevent and unnecessary catheters removed (early on)!
- Pyuria alone is not enough to make diagnosis of UTI
- Antibiotics should not be used to treat asymptomatic UTIs.
- Do not culture after completing antibiotic course.

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