Urinary Tract Infections: LTC Facilities

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November 2, 2011

Urinary Tract Infection (UTI): Definition

- “Clinically detectable condition associated with invasion by disease causing microorganism of some part of the urinary tract.
- ‘Urosepsis’ is systemic inflammatory response to infection (sepsis).”

--CMS F315 June 28, 2005
Classification of UTI

Upper tract UTI

Lower tract UTI

Epidemiology: Bacteriuria in Elderly

<table>
<thead>
<tr>
<th>Asymptomatic</th>
<th>Positive Urine Culture (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POPULATION</td>
<td>Women</td>
</tr>
<tr>
<td>Community &gt;70 yrs</td>
<td>10-18</td>
</tr>
<tr>
<td>Long-Term Care</td>
<td>25-55</td>
</tr>
<tr>
<td>Chronic Catheter</td>
<td>&gt;90%</td>
</tr>
</tbody>
</table>

Symptomatic

Nicolle LE. UTI in Hazzard’s Geriatric Medicine 6th ed. 2009

Nicolle LE. UTI in Hazzard’s Geriatric Medicine 6th ed. 2009
Risk Factors in LTC

- Age
- Urinary incontinence
- Prior UTI (women)
- BPH (men)
- Dementia
- Mobility limitations
- Bladder dysfunction (DM, PD, CVA)

Buhr GT et al.
Clin Geriatr Med 2011; 27:229

Pathophysiology

- Bacterial virulence factors
  - Adherence factors
  - Toxins
  - Proteases, invasins, motilins
  - Resistance factors

- Inoculum size

- Urinary tract infection

- Inadequacy of host defenses
  - Perurethra & urethra
  - Urine
  - Urination
  - Bladder urothelium
  - Immune response

- Alteration of host defenses
  - Obstruction: UUT / LUT
  - Detrusor overactivity
  - Pregnancy
  - Papillary necrosis
  - HIV and other immunodeficiency
  - DM, CHF, nephrocalcinosis
Infecting Bacteria:  
Asymptomatic LTC

<table>
<thead>
<tr>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>● E coli (47-77%)</td>
<td>● Proteus mirabilis (30-36%)</td>
</tr>
<tr>
<td>● Proteus mirabilis (2-27%)</td>
<td>● E coli (11-27%)</td>
</tr>
<tr>
<td>● Klebsiella pneum (7-11%)</td>
<td>● Klebsiella pneum (6-9%)</td>
</tr>
<tr>
<td>● Pseudomonas (5-9%)</td>
<td>● Enterobacter (2-9%)</td>
</tr>
<tr>
<td>● Enterococcus (5-8%)</td>
<td>● Enterococcus (5-24%)</td>
</tr>
</tbody>
</table>

Nicolle LE. UTI in Hazzard’s Geriatric Medicine 6th ed. 2009

Common Clinical Features

● Lower urinary tract symptoms
  – Dysuria
  – Urgency
  – Frequency
  – Suprapubic pain/tenderness
  – Hematuria
  – Cloudy urine

● Systemic symptoms
  – Nausea/vomiting
  – Fever/chills
  – Flank pain
  – Delirium
  – Functional decline
Diagnosis

- Asymptomatic bacteriuria: Urine Culture
  - $\geq 10^5$ cfu/mL on 2 voided consecutive specimens (women)
  - $\geq 10^5$ cfu/mL on 1 clean-catch urine specimen (men)
  - $\geq 10^2$ cfu/mL on 1 catheterized urine specimen

  Nicolle LE et al. IDSA Guidelines.
  Clin Infect Dis 2005: 40:643

- Symptomatic bacteriuria: Urine Culture
  - $\geq 10^4$ cfu/mL (pyelonephritis or fever with local GU symptoms)
  - $\geq 10^3$ cfu/mL (acute lower urinary tract symptoms)
  - $\geq 10^5$ cfu/mL (external catheter in men)
  - $\geq 10^3$ cfu/mL (aspirated indwelling catheter)

  Nicolle LE. UTI in Hazzard’s Geriatric Medicine 6th ed. 2009
F315 Indications to Treat Symptomatic UTI: residents without catheter (>3)

- Fever (increase of > 2° F; rectal temp > 100°F)
- New or increased burning, pain on urination, frequency or urgency
- New flank or suprapubic pain/tenderness
- Change in character of urine (new bloody urine, foul smell or amount of sediment) or lab report of + result (nitrite +, pyuria, microhematuria)
- Worsening of mental or functional status (confusion, lethargy, unexplained falls, recent onset of incontinence, decreased activity or appetite)


F315 Indications to Treat Catheter-associated UTI: (>2)

- Fever or chills
- New flank pain or suprapubic tenderness
- Change in character of urine (new bloody urine, foul smell, increased sediment or lab report of + pyuria, microscopic hematuria)
- Worsening of mental or functional status

What is the CMS/F315 guidance for indwelling (Foley) catheters/incontinence?

CMS/F315

- F315 released by CMS in June 28, 2005
- Intent of F315
  - incontinent resident to maintain as normal urine function as possible (assess/management)
  - Indwelling urinary catheter is not justified without medical indication
  - Prevent UTI through appropriate care

Indications for Catheters

- Urinary retention that cannot be treated or corrected medically or surgically
  - PVR $\geq 200$ ml
  - Inability to manage retention/incontinence with intermittent caths
  - Persistent overflow incontinence, SUTI, renal dysfunction


Indications for Catheters

- Contamination of stage 3 or 4 pressure ulcers when urine impedes healing despite appropriate care for the UI
- Terminal illness or severe impairment (uncomfortable or intractable pain)

Risks of Indwelling urinary Catheters

- UTI (with or without symptoms): biofilm
- Obstruction due to encrustations, kinking
- Bladder spasms
- Urinary leakage
- Urethral erosion, infection
- Sepsis

Compliance with F315: Urinary Incontinence and UTI

- Recognize and assess factors affecting urinary function and risk of UTI
- Attempt correction of underlying causes of UI
- Monitor response to preventive efforts and interventions
- Revise approaches as appropriate

Discuss management of the resident with dementia and a suspected urinary tract infection.

Dementia and UTI

- Dementia is risk factor in LTC for UTI
- Symptoms of UTI might not be reported
- No practice guideline: F315 criteria apply
- Monitor for symptoms/signs of UTI
  - Fever
  - Clinical deterioration
  - Check suprapubic/flank tenderness
How can recurrent urinary tract infections be managed?

Recurrent UTI

- Recurrent: 2 or more infections in 6 months
  - Relapse
  - Reinfection
- Might indicate structural abnormality (obstructive uropathy)
  - Check PVR
  - If catheter: check perineal hygiene technique
Preventing Recurrent UTI

- Eliminate chronic indwelling catheter
  - Condom catheter in non-demented men
- Improve resident walking, transfers, bed mobility
- Replace chronic with intermittent caths
- Vaginal estrogen for women?
- Cranberry juice or tablets?
- Abx? Not shown to be effective in LTC


Discuss urinary tract infection prevention strategies in the catheterized and non-catheterized resident.
Best Practice: UTI Prevention

● Adequate fluid intake
  – Cranberry juice 10 ounces/extract 300-400 mg daily

● Promote complete bladder emptying
  – Every 3-4 hours

● Perform daily perineal skin care
  – Prevent excessive skin wetness, contact with urine/feces
  – “front-to back” cleaning

● Appropriate incontinence products
  – super absorbent polymer  

Avoiding CAUTI

● Limiting unnecessary catheterization

● Discontinuation of catheter

● Strategies to consider before catheter
  – Education and training of staff

● Alternatives to indwelling catheters
  – Condom caths in men (effectiveness?)
  – Intermittent caths  
  – Suprapubic caths  

Newman DK. Ostomy/wound management 2006;52:34
**Prevention of CAUTI:**
Society for Healthcare Epidemiology of America (SHEA)

### Catheter Insertion
- Clean technique for Intermittent cath
- Secure cath to prevent movement/urethral traction
- Perform cath at regular intervals
- Check PVR to avoid unneeded cath insertion

### Catheter Maintenance
- Closed drainage system
- Replace catheter for break in aseptic technique
- Keep collecting bag below bladder level
- Use clean collecting container to empty bag
- Routine hygiene for meatal care

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**Keeping Seniors Healthy**

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