Reducing Antibiotic Prophylaxis for Prevention of UTI

The second “infection specific intervention” suggested by the CDC to improve antibiotic use involves UTI prophylaxis with antibiotics. Although consideration of antibiotic prophylaxis may be warranted in patients with recurrent UTIs (defined as ≥ 3 UTIs in a year), this should only occur following a thorough evaluation of other potential causes of recurrence (e.g., poor hygiene, sexual activity, postvoid residual volume > 50 mL). However, the CDC states, “Very few studies support antibiotic use for UTI prophylaxis, especially in older adults, and many studies have shown this antibiotic exposure increases risk of side effects and resistant organisms.” Likewise, antibiotic prophylaxis is not recommended for catheter placement, exchange, or removal. Another suggested strategy for UTI prevention is making an effort to minimize or avoid use of medications that are strongly anticholinergic (e.g., amitriptyline, cyclobenzaprine, paroxetine). Anticholinergic medications may increase the risk of UTI by decreasing bladder tone and increasing the risk of urinary retention. As an alternative to antibiotics, use of topical estrogen therapy in postmenopausal women and cranberry juice or extract may be considered. Studies evaluating the effectiveness of cranberry juice or extract have yielded conflicting results, but they remain a consideration for patients who do not utilize intermittent or indwelling catheters.

Focus on Selecting Rational Antibiotic Therapy - Part II

The Centers for Disease Control and Prevention (CDC) recommend that long-term care (LTC) facilities develop and follow policies that support optimal antibiotic use. Deciding when an antibiotic is necessary and selecting the most appropriate antibiotic for an infection are imperative. A primary step in reducing inappropriate antibiotic use and in selecting rational antibiotic therapy is determining whether or not an antibiotic is necessary. The minimum criteria for three of the most common categories of infections in LTC (skin and soft tissue infections, lower respiratory tract infections, and pneumonia) were reviewed in Part I. Part II will focus on urinary tract infections (UTI), with or without an indwelling catheter.

Why Are UTIs Significant in Achieving Optimal Antibiotic Use?

A primary goal of an antibiotic stewardship program (ASP) should be to avoid uncertainty about the rationale for, and/or appropriateness of antibiotic therapy. With this in mind, important statistics surrounding UTIs include the following:

1. UTIs are the most common type of bacterial infection in LTC (up to 22% prevalence)
2. UTIs are the second most common cause associated with hospital readmissions within 30 days (28% vs. 31% for heart failure)
3. UTIs account for ~5% of emergency department visits in those 65 years and older
4. UTIs cause 33% of all hospitalizations from LTC
5. 30-60% of antibiotics in LTC are for “suspected” UTIs

Although not all-inclusive, risk factors for UTIs in older LTC residents include:

- Poor perineal hygiene
- Indwelling catheters or other drainage devices
- Dementia or cognitive impairment
- Drugs that increase the risk of dehydration (e.g., diuretics)
- Drugs that reduce urinary flow (e.g., anticholinergics, antipsychotics)
- Fecal incontinence or impaction
- Increased age
- Diabetes
- Stroke
- Severe chronic kidney disease or polycystic kidney disease
- BPH or urinary obstruction
- Spinal cord injury
Within Appendix A of “The Core Elements of Antibiotic Stewardship for Nursing Homes”, the CDC provides four “Infection specific interventions to improve antibiotic use”. Two of their four suggestions involve UTIs:

• Reduce antibiotic use in asymptomatic bacteruria (ASB)
• Reduce antibiotic prophylaxis for prevention of UTI

Reducing Antibiotic Use in Asymptomatic Bacteruria (ASB)
Because of the high rate of antibiotic use for “suspected” UTIs (30-60%), ASB should be considered a primary focus when implementing an antibiotic stewardship program in LTC. ASB involves the quantitative presence of bacteria in the urine, with the absence of other physical signs or symptoms suggestive of a UTI. The rate of ASB in non-catheterized patients is estimated at 18-57% for females and 19-38% for males, but the rate approaches 100% after 30 days of having an indwelling catheter for both groups. Although antibiotics are frequently used for ASB, the medical evidence suggests that they: 1) do not provide long-term benefits in preventing symptomatic UTI; 2) do not improve mortality; 3) may unnecessarily subject an individual to adverse drug events and drug interactions; 4) may increase the risk of subsequent infections with a multi-drug resistant organism for the individual, as well as for other facility residents.

Is a urine culture necessary?
Because ASB does not require treatment with an antibiotic, differentiating between ASB and UTI is a critical approach to combating inappropriate antibiotic use in LTC. Urine dipstick testing is commonly utilized in LTC, but according to a February 2014 clinical review in the *Journal of the American Medical Association*, dipstick testing should be used to *rule out* a UTI, rather than to *rule in* a UTI. This is due to variability in the test’s sensitivity and specificity. Beyond the diagnostic differences between ASB and a UTI, it must be recognized that urine cultures may over-diagnose an “infection” in 1/3 of cases, thereby resulting in inappropriate antibiotic use. Similar, research has shown that 1/3 of LTC patients who received a diagnosis based solely on urine odor, were negative for a UTI when tested. Although potentially indicative of an infection, a change in urine odor and/or color may instead be related to dehydration, poor hygiene, or changes in medication or diet. Therefore, increased monitoring for changes in the resident’s condition, combined with improved fluid intake, perineal cleansing, and scheduled toileting can be beneficial, and should be encouraged, as opposed to simply obtaining a urine culture. Only when new UTI symptoms (e.g., fever, urinary urgency, flank and/or suprapubic pain) present should a urine culture be obtained. In patients with a chronic indwelling catheter (in place for more than 14 days), it is recommended that the original catheter be replaced prior to obtaining a urine specimen. Additionally, because of the high rate of ASB, in the absence of new symptoms, repeating urine cultures following antibiotic treatment as a “test of cure” is strongly discouraged.

The Revised McGeer Criteria for UTIs
In October 2012 the CDC and the Society of Healthcare Epidemiology of America (SHEA) jointly published revised definitions (“the revised McGeer Criteria”) specifically for use in LTC facilities (available for free at: http://www.jstor.org/stable/10.1086/677439?ndtn-full-text-tab-contents). The revised McGeer Criteria provide separate definitions for a UTI depending upon whether or not the patient has an indwelling catheter. These definitions are important in determining the appropriateness of initiating antibiotic treatment.

### Urinary Tract Infection (without an indwelling catheter) “both criteria must be present”

<table>
<thead>
<tr>
<th>At least one of the following sign or symptom subcriteria:</th>
</tr>
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<tr>
<td>Fever or leukocytosis AND Acute costovertebral pain, suprapubic pain, gross hematuria, and/or new or increased urinary incontinence, urgency or frequency</td>
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#### Microorganisms to consider: *Escherichia coli*, *Serratia sp.*, and *Klebsiella sp.*

In contrast to the probability of a UTI in residents without an indwelling catheter, there is a significantly higher probability when the resident does have an indwelling catheter. As such, an estimated 70% of health care-associated UTIs are linked to urinary catheter use. Current data suggest that urinary catheters may be judged inappropriate in 21-50% of cases. For these reasons, avoiding unnecessary insertion of a urinary catheter and removing the urinary catheter as soon as possible should remain top priorities.

### Urinary Tract Infection (with an indwelling catheter) “both criteria must be present”

<table>
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</tr>
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#### Microorganisms to consider: *Escherichia coli*, *Klebsiella sp.*, *Enterococcus sp.*, *Providencia sp.*, *Proteus sp.*, and/or *Pseudomonas aeruginosa “Frequently polymicrobial”*
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Urinary Tract Infection (without an indwelling catheter) “both criteria must be present”

At least one of the following sign or symptom subcriteria:

- Acute dysuria or acute pain, swelling, or in males only, tenderness of the genitalia
- Fever or leukocytosis AND Acute costovertebral pain, suprapubic pain, gross hematuria, and/or new or increased urinary incontinence, urgency, or frequency

In the absence of fever or leukocytosis, 2 or more of the following: suprapubic pain, gross hematuria, and/or new or increased urinary incontinence, urgency, or frequency

Microorganisms to consider: Escherichia coli, Serratia sp., and Klebsiella sp.

Microorganisms to consider: Escherichia coli, Klebsiella sp., Enterococcus sp., Providencia sp. Proteus sp., and/or Pseudomonas aeruginosa **Frequently polymicrobial**

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Urinary Tract Infection (with an indwelling catheter) “both criteria must be present”

At least one of the following sign or symptom subcriteria:

- Fever, rigors, or new-onset hypotension with no alternate site of infection
- Either acute change in mental status or acute functional decline with no alternate diagnosis and leukocytosis
- New-onset suprapubic pain or costovertebral angle pain or tenderness
- Purulent discharge from around the catheter or acute pain, swelling, or in males only, tenderness of the male genitalia

Microorganisms to consider: Escherichia coli, Klebsiella sp., Enterococcus sp., Providencia sp. Proteus sp., and/or Pseudomonas aeruginosa **Frequently polymicrobial**

Reducing antibiotic use in asymptomatic bacteriuria (ASB) reduces antibiotic prophylaxis for prevention of UTI.
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