TO TREAT OR NOT TO TREAT
THAT IS THE QUESTION

Ruth Kandel, MD
Director, Infection Control
Hebrew SeniorLife
Assistant Professor
Harvard Medical School
Boston, MA

Consultant to Massachusetts Partnership Collaborative:
Improving Antibiotic Stewardship for UTI
Objectives

• Define whether to screen for or treat asymptomatic bacteriuria in an elderly population

• Review complications of antibiotic use

• Define symptomatic urinary tract infections

• Review challenges of diagnosis in the elderly
SUMMARY OF RECOMMENDATIONS

1. The diagnosis of asymptomatic bacteriuria should be based on results of cultures of at least two different specimens collected on two separate days that meet the guidelines for standardization (A1B) (Table 1).
   • For asymptomatic women, bacteriuria is defined as ≥2 accessory cultures or voiding cultures with isolation of the same bacterial strain in quantitative cultures ≥10^5 CFU/mL (B II).
   • A single, intact catheterized voiding specimen with a bacterial species isolated in a quantitative count ≥10^5 CFU/mL identifies bacteriuria in men (B II).
   • A single catheterized urine specimen with a bacterial species isolated in a quantitative count ≥10^5 CFU/mL identifies bacteriuria in women (B II).

2. Pyelitis accompanying asymptomatic bacteriuria is not an indication for antimicrobial treatment (A-E).

3. Pregnant women should be screened for bacteriuria at least once late in pregnancy, and they should be cured if the result is positive (A II).
   • The duration of antimicrobial therapy should be 3-7 days (A II).
   • Periodic screening for recurrent bacteriuria should be considered following therapy (A II).
   • No recommendation can be made for or against repeated screening of culture-negative women in lower pregnancies.

4. Screening for and treatment of asymptomatic bacteriuria before transcervical retrieval of the placenta is recommended (A I).
   • An assessment for the presence of bacteriuria should be obtained, so that results will be available to direct antimicrobial therapy prior to the procedure (A II).
   • Antimicrobial therapy should be administered before the procedure (A II).
   • Antimicrobial therapy should not be continued after the procedure, unless an indwelling catheter remains in place (B II).

5. Screening for the identification of asymptomatic bacteriuria is recommended before other surgical procedures for which standard bladder instrumentation (A II).
   • Screening for the treatment of asymptomatic bacteriuria is not recommended for the following persons:
     • Pyelonephritis, pyelonephritis, women (A I).
     • Obstetrics, women (A I).
     • Elderly, institutionalized subjects (A II).
     • Medicare, patients with chronic renal injury (A II).
     • Contraindication: eGFR the sodium excretion to eGFR.

6. Antimicrobial treatment of asymptomatic bacteriuria in women with catheter-acquired bacteriuria that persists ≥4 wk after indwelling catheter removal may be considered (B II).
What is Asymptomatic Bacteriuria?
Asymptomatic Bacteriuria (ASB)

• Laboratory diagnosis
• Positive urine culture
  – Colony count significant ($>10^5$ cfu/mL)
• Absence of symptoms

Clinical Infectious Disease 2010;50:625-663
Pyuria

- Pyuria (> 10 WBC / high-power field) is evidence of inflammation in the genitourinary tract
  - In persons with neutropenia significant bacteriuria may occur without pyuria

- Pyuria is commonly found with ASB
  - Elderly institutionalized residents 90% (Infect Dis Clin North Am 1997;11:647-62)
  - Short-term (< 30 days) catheters 30-75% (Arch IM 2000;160:673-82)
  - Long-term catheters 50-100% (Am J Infect Control 1985;13:154-60)
Treatment for ASB Indicated

• Pregnant women
  – Increased risk for adverse outcomes

• Urologic interventions
  • TURP
  • Any urologic procedure with potential mucosal bleeding
Treatment for ASB Not Indicated

- Premenopausal, non pregnant women
- Diabetic women
- Older persons living in the community
- Elderly living in long term care facilities
- Persons with spinal cord injury
- Catheterized patients

CID2005;40:643-654
Prevalence of ASB

**POPULATION**

- Healthy premenopausal women
  - Prevalence %: 1-5

- Postmenopausal women
  - (50 to 70 years of age)
  - Prevalence %: 2.8-8.6

- Older community-dwelling patients
  - Women (older than 70 years)
    - Prevalence %: 10.8-16
  - Men
    - Prevalence %: 3.6-19

- Older long-term care residents
  - Women
    - Prevalence %: 25-50
  - Men
    - Prevalence %: 15-40

- Patients with an indwelling catheter
  - Short-term
    - Prevalence %: 9-23
  - Long-term
    - Prevalence %: 100

CID2005;40:643-654
No Benefit Treating ASB in the Elderly

- Large long-term studies of ASB in pre and postmenopausal women
  - NO ADVERSE OUTCOMES if not treated

- Randomized studies (treatment vs. no treatment) in elderly LTC residents
  - NO BENEFIT to treatment
  - No decreased rate of symptoms
  - No improved survival

CID2005;40:643-654
<table>
<thead>
<tr>
<th>Authors</th>
<th>Subjects</th>
<th>Intervention</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicolle LE, et al.</td>
<td>Men, NH, median age 80</td>
<td>Treated 16</td>
<td>No difference mortality or infectious morbidity 2 groups</td>
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<tr>
<td>NEJM 1983;309:1420-5</td>
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<td>Not treated 20</td>
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<td></td>
<td></td>
<td>Duration 2 years</td>
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<tr>
<td>Nicolle LE, et al.</td>
<td>Women, NH, median age 83</td>
<td>Treated 26</td>
<td>No difference mortality/GU morbidity. Increase drug reactions and AB resistance treated group.</td>
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<td>Am J Med 1987;83:27-33</td>
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<td></td>
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<td>Duration 1 year</td>
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<tr>
<td>Abrutyn E, et al.</td>
<td>Women, ambulatory and NH Mean age 82</td>
<td>Treated 192</td>
<td>No survival benefit from treatment</td>
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<td>Ann Intern Med 1994;120:827-33</td>
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<td>Not treated 166</td>
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<td></td>
<td></td>
<td>Duration 8 years</td>
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<tr>
<td>Ouslander JG</td>
<td>Women and men NH Mean age 85</td>
<td>Treated 33</td>
<td>No difference chronic urinary incontinence</td>
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<tr>
<td>Ann Intern Med 1995;122:749-54</td>
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<td>Not treated 38</td>
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<td></td>
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<td>Duration 4 weeks</td>
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## Cohort Studies

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<th>Authors</th>
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<th>Outcome</th>
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<tbody>
<tr>
<td>JAGS 1990;38:1209-14</td>
<td>Men, Ambulatory, &gt; 65 years</td>
<td>29 Subjects</td>
<td>No adverse outcomes attributed to no treatment</td>
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<tr>
<td></td>
<td></td>
<td>Duration 1-4.5 years</td>
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<tr>
<td>NEJM 1986;314:1152-6</td>
<td>Population based Swedish men and women</td>
<td>Duration 5 years</td>
<td>No association between bacteriuria and survival</td>
</tr>
<tr>
<td>Gerontology 1986;32:167-71</td>
<td>Population based Finnish men and women &gt; 85 years</td>
<td>Duration 5 years</td>
<td>No association between bacteriuria and survival</td>
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</tbody>
</table>
Proportion of Women with Diabetes Who Remained Free of Symptomatic Urinary Tract Infection, According to Whether They Received Antimicrobial Therapy or Placebo at Enrollment.

IDSA Recommendations

• Routine screening for and treatment of ASB in older individuals in the community is not recommended.

• Screening for and treatment of ASB in elderly residents in LTCFs is not recommended.

CID2005;40:643-654
Any Problems Just Treating?
Problems with Antibiotics

- Adverse Drug Reactions
- MDRO
- *C. Difficile* Infection
Antibiotics are misused in hospitals

• “It has been recognized for several decades that up to 50% of antimicrobial use is inappropriate”
• IDSA/SHEA Guidelines for Antimicrobial Stewardship Programs
• http://www.journals.uchicago.edu/doi/pdf/10.1086/510393
Antibiotic misuse adversely impacts patients - adverse events

• In 2008, there were 142,000 visits to emergency departments for adverse events attributed to antibiotics.¹

¹ Shehab N et al. Clinical Infectious Diseases 2008; 15:735-43
Antibiotic misuse adversely impacts patients - resistance

- Getting an antibiotic increases a patient’s chance of becoming colonized or infected with a resistant organism.
Antibiotic resistance increases mortality
Antibiotic-Resistant Bacteria Travels
Antibiotic misuse adversely impacts patients- *C. difficile*

- Antibiotic exposure is the single most important risk factor for the development of *Clostridium difficile* associated disease (CDAD).
  - Up to 85% of patients with CDAD have antibiotic exposure in the 28 days before infection\(^1\)

Rates of *Clostridium difficile* Infection Among Hospitalized Patients Aged ≥65 Years

*CDC* September 2, 2011 / 60(34);1171
Deaths from Gastroenteritis Double

*C. difficile* and *norovirus* are the leading causes

- Adults over 65 years old accounted for 83 percent of deaths.
- *Clostridium difficile* and *norovirus* most common infectious causes.
- *Clostridium difficile*
  - Accounted for two-thirds of the deaths.
  - Presumed cause is spread of a hypervirulent, resistant strain of *C. difficile*.

*CDC March 14, 2012 Press Release*
Background: Epidemiology

Risk Factors

- Antimicrobial exposure
- Acquisition of *C. difficile*
- Advanced age
- Underlying illness
- Immunosuppression
- Tube feeds
- Gastric acid suppression

**Main modifiable risk factors**

*FDA Drug Safety Communication:* *Clostridium difficile* infection can be associated with stomach acid drugs known as proton pump inhibitors (PPIs) February 2012
CDC: Get Smart About Antibiotics LTC

• Antibiotic resistance is one of the world’s most pressing public threats.

• Antibiotic resistance in long-term care increases risk
  – Hospitalization
  – Death
  – Cost of treatments
CDC: Get Smart About Antibiotics LTC

• Antibiotics are among the most commonly prescribed medications in long-term care facilities.

• Up to 70% of long-term care facilities’ residents receive an antibiotic every year.

• Estimates of the cost of antibiotics in the long-term care setting range from $38 million to $137 million per year.
Factors Associated with Antimicrobial Use in Nursing Homes: A Multilevel Model
• Many long-term care residents can be “colonized” with bacteria.

• Challenges with separating colonization from true infection can contribute to antibiotic overuse in this setting.

• Studies have consistently shown
  – About 30%-50% of frail, elderly long-term care residents can have a positive urine culture even without any symptoms of a urinary tract infection.

  – Unfortunately, many of these patients are placed inappropriately on antibiotic therapy.

  • CDC Get Smart Program
My Mother-in-Law

- Admitted to rehab facility s/p surgery
- Foley placed for unclear reasons
- Foley removed after multiple requests but UA and C&S sent for unclear reasons
- Antibiotics initiated for positive urine culture
- Antibiotics stopped after multiple requests
- *C difficile* infection soon followed
When to Treat
Urinary Tract Infections
Long Term Care
Challenges

• Comorbid illnesses may result in symptoms similar to UTIs.
• Cognitive impairment may make reporting of symptoms difficult.
• Older individuals can have atypical presentations for infections.
• There is a lack of evidenced based guidelines for symptomatic UTIs.
Criteria for Surveillance, Diagnosis and Treatment

• Based on consensus group recommendations

• Modified by
  – Recent clinical practice guidelines
  – Current research
Criteria for Surveillance, Diagnosis and Treatment

Consensus group recommendations

• McGeer criteria (recently revised) developed for surveillance and outcome assessments
  – Used by Centers for Medicare and Medicaid Services

• Loeb criteria recommends minimal set of criteria necessary to initiate antibiotic therapy for UTI
  – Similar to IDSA Guidelines
### Revised McGeer Resident Without Indwelling Catheter

**Clinical (At least one of the following must be met)**

1. Either of the following:
   - Acute dysuria
   - Acute pain, swelling or tenderness of testes, epididymis or prostate

2. If either FEVER or LEUKOCYTOSIS present need to include ONE or more of the following:
   - Acute costovertebral angle pain or tenderness
   - Suprapubic pain
   - Gross hematuria
   - New or marked increase in incontinence
   - New or marked increase in urgency
   - New or marked increase frequency

3. If neither FEVER or LEUKOCYTOSIS present INCLUDE TWO or more of the ABOVE.

**Lab (At least one of the following must be met)**

1. **VOIDED SPECIMEN: POSITIVE URINE CULTURE (≥ 10⁵ CFU/ML) NO MORE THAN 2 ORGANISMS**

2. **STRAIGHT CATH SPECIMEN: POSITIVE URINE CULTURE (≥ 10² CFU/ML) ANY NUMBER OF ORGANISMS**

Infect Control Hosp Epidemiol 2012;33:965-977
## Revised McGeer Resident With Indwelling Catheter

### (A) CLINICAL (At least one of the following present with no alternate explanation)

- □ Fever
- □ Rigors
- □ New onset hypotension
- □ Either acute change in mental status or acute functional decline, with no alternate diagnosis AND leukocytosis
- □ New onset costovertebral angle pain or tenderness
- □ New onset suprapubic pain
- □ Acute pain, swelling or tenderness of the testes, epididymis or prostate
- □ Purulent drainage from around the catheter

### (B) LAB (Must be met)

- □ Positive urine culture (≥ 10⁵ CFU/mL) OF ANY ORGANISM(S)

Infect Control Hosp Epidemiol 2012;33:965-977
Revised McGeer Comments

• Culture specimens should be processed as soon as possible, preferably within 1-2 h.

• If urine specimen cannot be processed within 30 minutes of collection, it should be refrigerated.

• Refrigerated specimen should be cultured within 24 h.

Infect Control Hosp Epidemiol 2012;33:965-977
Loeb Minimal Criteria 2001
Initiating Antibiotics

No Indwelling Catheter

• Acute dysuria  Or
• Fever* + new or worsening (must have at least one of following)
  – Urgency
  – Frequency
  – Suprapubic pain
  – Gross hematuria
  – Costovertebral angle tenderness
  – Urinary incontinence

Chronic Indwelling Catheter

Must have at least one of the following

• Fever*
• New costovertebral angle tenderness
• Rigors (shaking chills)
• New onset delirium

*Fever > 100° or 2.4° F above baseline

ICHE 2001;22:120-124
Criteria for Surveillance, Diagnosis and Treatment

Clinical Practice Guidelines

• Infectious Disease Society of America (IDSA) Clinical Practice Guidelines Fever and Infection Long-Term Care Facilities 2008 *CID* 2009;48:149-171

• IDSA Clinical Practice Guidelines Catheter-Associated Urinary Tract Infections Adults 2009 *CID* 2010;50:625-663

• IDSA Guidelines Asymptomatic Bacteriuria *CID* 2005;40:643-654
Criteria for Surveillance, Diagnosis and Treatment

Current Research

Diagnostic algorithm for ordering urine cultures for NH residents in intervention arm

Fever of >37.9°C (100°F) or 1.5°C (2.4°F) increase above baseline on at least two occasions over last 12 hours?

Yes

2 or more symptoms or signs of non-urinary tract infection*?

Yes

Order urine culture for one or more of following:
- Dysuria
- Urinary catheter
- Urgency
- Flank pain
- Shaking chills
- Urinary incontinence
- Frequency
- Gross haematuria
- Suprapubic pain

No

Order urine culture for new onset burning urination or for two or more of following:
- Urgency
- Flank pain
- Shaking chills
- Urinary incontinence
- Frequency
- Gross haematuria
- Suprapublic pain

No

Order urine culture for one or more of following:
- New costovertebral tenderness
- Rigors
- New onset of delirium

No

Urinary catheter?

Yes

Do not order urine culture

No

©2005 by British Medical Journal Publishing Group

Loeb M et al. BMJ 2005;331:669

* Respiratory symptoms include increased shortness of breath, increased cough, increased sputum production, new pleuritic chest pain.
Gastrointestinal symptoms include nausea or vomiting, new abdominal pain, new onset of diarrhoea
Skin and soft tissue symptoms include new redness, warmth, swelling, purulent drainage
Treatment algorithm for prescribing antimicrobials to NH residents in intervention arm

Loeb M et al. BMJ 2005;331:669
Monthly rates of antimicrobial prescriptions for urinary indications in intervention and usual care nursing homes.

Loeb M et al. BMJ 2005;331:669
Preventing Unnecessary Use of Antibiotics

- **ASSESSMENT protocols**
  - Bacterial infection less likely if resident afebrile, CBC normal, no signs/symptoms of focal infection

- **SPECIFIC CRITERIA for initiating antibiotics**
  - Loeb criteria UTI

- **OBSERVATION as a STANDARD MEDICAL PROCEDURE**
  - Monitoring protocols

  - JAMDA 2010;11:537-539
When Antibiotics are Not Prescribed (Monitoring Protocol)

• Monitor vital signs for several days
• Monitor for progression of symptoms or change in clinical status
• Encourage fluid intake
• Consider alternate diagnosis for nonspecific symptoms
• If symptoms resolve, no further intervention required

• Annals of LTC April 2012;20:23-29
Change in Mental Status ≠ Symptomatic Urinary Tract Infection

• LTCF residents with cognitive impairment are more likely to have ASB (no symptoms, positive urine culture).

• LTCF residents with cognitive impairment are more vulnerable to changes in mental status with any new problem.

• THEREFORE, resident with cognitive impairment and change in mental status
  – MORE LIKELY to have a positive urine culture,
  – Independent of whether infection is the cause of clinical decline,
  – OR if infection is present, whether urinary tract is the source.

JAGS 2009 57:1113-1114
Change in Mental Status in Dementia

- Acute change in cognition
  - Confusion
  - Impaired function

- Acute change in behavior
  - Aggression or agitation (verbal or physical)
  - Resistance to care
  - Hallucinations
  - Delusions
  - Lethargy

- Delirium: Fluctuations in mental status, inattention, disorganized thinking, altered level of consciousness
### Change in Mental Status: Delirium(s)

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<thead>
<tr>
<th>D</th>
<th>Drugs</th>
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<tr>
<td></td>
<td>BEERS Criteria (e.g., anticholinergic, benzodiazepines, hypnotics) OR dose change</td>
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<tr>
<td></td>
<td>Dementia Lewy bodies: Fluctuations in alertness and attention</td>
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<tr>
<td></td>
<td>Pain</td>
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<td></td>
<td><strong>Discomfort</strong></td>
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<td>E</td>
<td>Eyes, ears, environment</td>
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<td></td>
<td>Sensory deprivation; vulnerability to environment</td>
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<td>L</td>
<td>Low oxygen states</td>
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<td>Myocardial infarction, stroke, pulmonary embolus</td>
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<td>I</td>
<td>Infection</td>
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<td>Pneumonia, sepsis, symptomatic UTI</td>
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<td>R</td>
<td>Retention</td>
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<td>Urinary retention, constipation</td>
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<td>Ictal states</td>
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<td>Underhydration/nutrition</td>
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<td>Metabolic Causes</td>
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<td>Low or high blood sugar, sodium abnormalities</td>
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<td>S</td>
<td>Subdural hematoma</td>
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<td></td>
<td>Head trauma</td>
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Adapted from Saint Louis University Geriatric Evaluation Mnemonics Screening Tools
AGS BEERS CRITERIA FOR POTENTIALLY INAPPROPRIATE MEDICATION USE IN OLDER ADULTS

FROM THE AMERICAN GERIATRICS SOCIETY

This clinical tool based on the AGS 2012 Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults (AGS 2012 Beers Criteria) has been developed to assist healthcare providers in improving medication safety in older adults. Our purpose is to inform clinical decision-making concerning the prescribing of medications for older adults in order to improve safety and quality of care.

Originally conceived in 1991 by the late Mark Beers, MD, a geriatrician, the Beers Criteria for geriatric medications that cause adverse drug events in older adults due to their pharmacologic properties and the physiologic changes of aging. In 2011, the AGS undertook an update of the criteria, assembling a team of experts and leading the development of the AGS 2013 Beers Criteria using an enhanced, evidence-based methodology. Each criterion is rated (quality of evidence and strength of evidence) using the American College of Physicians’ Evidence Grading System, which is based on the GRADE scheme developed by Guyatt et al.

The full document together with accompanying resources can be viewed online at www.americangeriatrics.org.

INTENDED USE

The goal of the tool is to improve care of older adults by reducing their exposure to Potentially Inappropriate Medications (PIMs).

- This should be viewed as a guide for identifying medications for which the risks of use in older adults outweigh the benefits.
- These criteria are not meant to be applied in a passive manner.
- This tool is not meant to supplant clinical judgment or an individual patient’s needs and use of PIMs should be individualized and involve shared decision-making.
- These criteria also underscore the importance of using a team approach to prescribing and non-pharmacological approaches and of having economic and organizational incentives for this type of model.
- Implicit criteria such as the STOPP/START criteria and Medication Appropriateness Index should be used in a complementary manner with the 2013 AGS Beers Criteria for guiding clinicians in making decisions about safe medication use in older adults.

The criteria are not applicable in all circumstances (e.g., patients receiving palliative and hospice care). If a clinician is unable to find an alternative and wishes to continue to use a drug, the list in an individual patient, discontinuation of the medication as potentially inappropriate can serve as a reminder for close monitoring so that the potential for an adverse drug effect can be incorporated into the medical record and prevented or detected early.

Table 1: 2012 AGS Beers Criteria for Potentially Inappropriate Medication Use in Older Adults

<table>
<thead>
<tr>
<th>Organ System</th>
<th>Therapeutic Category/Drug(s)</th>
<th>Recommendation, Rational</th>
<th>Quality of Evidence (QE) &amp; Strength of Recommendation (SR)</th>
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<tbody>
<tr>
<td>Antihypertensives (includes HAs)</td>
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<td>First-generation antihypertensives (as single agent or as part of combination products)</td>
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Case Weekend Sign-Out

• LTC resident
  – Low back pain (worse with movement)
  – Family concerned new onset lethargy, history UTIs
• PMH: Parkinson’s disease dementia
• PE: VSS Normal exam- at baseline
• Labs: WBC normal, UA pyuria, urine culture +
• Impression?
Case Weekend Sign-Out

- Given lack of signs or symptoms resident most likely has asymptomatic bacteriuria (seen in 25-50% females in LTCF). Hesitant to treat with no clinical indication given would be at risk for complications from antibiotics (adverse side effects, mdro, c difficile infection) without any clear benefit. We will closely monitor the resident to see if anything evolves.
UTI Protocol: ABCs

ABCs for Diagnosing Urinary Tract Infection in Long Term Care

Resident Name: __________________________ Date/Time: __________________________
Nurse: __________________________ NUR/NP/PA: __________________________

Diagnosis of Urinary Tract Infection (UTI) in long term care resident requires clinical signs and symptoms of UTI and a positive culture.

Assessment: Clinical Signs and Symptoms of UTI

☐ CHECK HERE IF CRITERIA ARE MET FOR SIGNS OR SYMPTOMS

Resident without indwelling catheter

☐ Acute dysuria alone OR
☐ Fever + at least one of the symptoms below (new or increased) OR
☐ If no fever, at least two of the symptoms below (new or increased)
☐ Urgency
☐ Frequency
☐ Suprapubic pain
☐ Gross hematuria
☐ Costovertebral angle tenderness
☐ Urinary incontinence

Resident with indwelling catheter

☐ At least one of the symptoms below (new or increased)
☐ Fever
☐ Costovertebral angle (CVA) tenderness
☐ Rigors (shaking chills)
☐ Delirium
☐ Flank pain (back, side pain)
☐ Pelvic discomfort
☐ Acute hematuria
☐ Malaise or lethargy with no other cause

OR

Blood Pressure: ________________ Pulse: ________________ Temperature: ________________ Respiratory Rate: ________________

☐ Fever (oral > 100°F or any site > 2°F above baseline or repeated oral > 99°F / rectal > 99.5°F)

Bacteria (Order urinalysis and culture & sensitivity if above criteria are met)

Collect clean, voided specimen if possible; in and out catheter if necessary. For residents with chronic indwelling Foley catheter, change catheter; send urine obtained from new catheter.
Consider CBC, BMP if clinically indicated (e.g., lethargy, fever).

Urinalysis
☐ Positive ☐ Negative

Culture and sensitivity
☐ Positive urine culture:
☐ Clean catch specimen ≥ 10^5 cfu/mL with ≤ 2 organisms
☐ Catheterized specimen (straight cath or newly placed indwelling cath): ≥ 10^5 cfu/mL with ≥ 1 organism
☐ Negative urine culture

Care Plan

Criteria met for UTI symptoms AND positive urine culture

☐ Review for treatment with antibiotics
☐ Monitor vital signs
☐ Monitor fluid intake and increase if indicated

Criteria not met for UTI symptoms (with or without a positive urine culture)

☐ Review for alternate diagnosis
☐ Monitor vital signs and symptoms
☐ Monitor fluid intake and increase if indicated
☐ Re-evaluate if above criteria for symptomatic UTI emerge

AT ANY POINT, re-evaluate and review with MD/NP/PA if symptoms progress or if resident appears clinically unstable (e.g., fever > 102°F, heart rate > 100, RR > 30, BP < 90 systolic, finger stick glucose < 50 or > 400, resident unable to eat or drink).

Prior to treatment consider review:

Advance directives for limiting treatment (especially antibiotics):
☐ NO ☐ YES
Medication Allergies:
☐ NO ☐ YES
The resident is on warfarin (Coumadin):
☐ NO ☐ YES

Possible causes for mental status changes include:

- Constipation
- Pain
- Dehydration
- Medication or dose change
- Hypoxia

Infections such as pneumonia
- Hypo/hyperglycemia
- Urinary retention
- Environmental triggers

NOTES

__________________________________________________________

__________________________________________________________

__________________________________________________________

*SO 20100.0025-00D [ISO guidelines 8017; © 2000 ASHRAE 138-17] [ISO guidelines 13785; ISO 3050-2013] [ACI 13.1-08 (LE Industri)]; D0 X2006, A0050.04 [ISO guidelines 4251]
Collecting Urine Samples

• Mid-stream or clean catch specimen for cooperative and functionally capable individuals. However, often necessary
  – For males to use freshly applied, clean condom (external) catheter and monitor bag frequently
  – For females to perform an in-and-out catheterization
• Residents with long-term indwelling catheters
  – Change catheter prior to collection (sterile technique/equip.)
• Resident with short-term catheterization (< 14 days)
  – Obtain by sampling through the catheter port using aseptic technique
  – If port not present may puncture the catheter tubing with a needle and syringe
  – If catheter in place > 2 weeks at onset of infection, replace

CHE 2012;33:965-977
CID 2009;48:149-171
CID 2010;50:625-663
Role of Dipstick Testing in the Evaluation of Urinary Tract Infection in Nursing Home Residents

Negative dipsticks tests for leukocyte esterase and nitrites do not support UTI BUT cannot completely rule it out

- Leukocyte esterase (LE)
  - Enzyme found in white blood cells

- Nitrites
  - ONLY CERTAIN BACTERIA reduce urinary nitrates to nitrites

<table>
<thead>
<tr>
<th>Dipstick test results for leukocyte esterase and nitrite</th>
<th>Laboratory evidence of UTI</th>
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<tbody>
<tr>
<td>Positive for either</td>
<td>Positive</td>
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<td>40</td>
<td>49</td>
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<td>Negative for both</td>
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NOTE. When the presence of leukocyte esterase and nitrite were assessed together, sensitivity was 100%, specificity was 20%, positive predictive value was 45%, and negative predictive value was 100%. UTI was defined as >100,000 colony forming units/ml. on urine culture and >10 white blood cells/mm³ on urinalysis. The dipstick test for leukocyte esterase was defined as positive if the result in the medical record was trace, +, or ++.
Urine Culture

• A urine culture should always be obtained when evaluating SYMPTOMATIC infections.

• Urine cultures will assist in appropriate antibiotic selection.

• A negative urine culture obtained prior to initiation of antibiotics excludes routine bacterial urinary tract infection.

• Repeat urine culture following treatment ("test of cure") is NOT recommended.
Blood Cultures

• Obtain when suspect urosepsis (along with urine culture)
  – High fever
  – Shaking chills
  – Hypotension
Key Points

• Routine screening for and treatment of ASB is not recommended
  – In older individuals in the community
  – In elderly residents in LTCFs

• Get Smart About Antibiotics
  – Antibiotic resistance is one of the world’s most pressing public threats.
  – *Clostridium difficile* infections are on the rise and are associated with increased mortality especially among the elderly

• Treat only symptomatic urinary tract infections in the elderly
  – Refer to clinical guidelines to assist in making a diagnosis