Developing an Antimicrobial Stewardship around Asymptomatic Bacteriuria
March 24, 2016
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Workshop outline
- Overview of asymptomatic bacteriuria (ASB) and UTI
- Review cases submitted by participants
- Group activity: developing an antimicrobial stewardship program
  - Chartering the project (2 teams)
  - Data, measurement, and reporting (2 teams)
- Report out from group activities

What is a scapegoat?
- A person or group made to bear the blame for others or to suffer in their place.
- Chiefly Biblical: a goat let loose in the wilderness on Yom Kippur after the high priest symbolically laid the sins of the people on its head. Lev. 16:8,10,26
- Urine in a catheterized inpatient
  - Easy to collect
  - Nearly always “dirty” in long-term catheter use

Definitions of CAUTI

<table>
<thead>
<tr>
<th>Definition Source</th>
<th>Use</th>
<th>Advantages</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Healthcare Safety Network (NHSN)</td>
<td>CAUTI surveillance for reporting and metrics</td>
<td>Objective criteria</td>
<td>Does not correlate with clinical CAUTI or clinician practice</td>
</tr>
<tr>
<td>Clinical Practice Guideline Infectious Disease Society of America (IDSA)</td>
<td>Define CAUTI for clinical diagnostic purposes</td>
<td>Diagnosis by exclusion minimizes overdiagnosis</td>
<td>Not easy for a clinician to apply to a specific patient</td>
</tr>
<tr>
<td>Claims-based (ICD-9-CM)</td>
<td>Used for billing</td>
<td>Identified by diagnosis codes</td>
<td>Low sensitivity to capture clinical CAUTIs</td>
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<tr>
<td>Clinician Diagnosis</td>
<td>Decide whether to treat and explain clinical symptoms</td>
<td>Based on a clinician evaluation</td>
<td>Subjective, non-standardized, potential for inappropriate antimicrobial use</td>
</tr>
</tbody>
</table>

Fakih et al. Infection Control Hosp Epidemiology 2015
Relationship of Bacteriuria to ASB and CAUTI

Bacteriuria means a positive urine culture

Bacteriuria

ASB

CAUTI

IDSA Guidelines for Asymptomatic Bacteriuria

Screening and treatment of bacteriuria recommended for:
1. Pregnancy
2. Before transurethral resection of the prostate
3. Urologic procedures for which mucosal bleeding is anticipated

IDSA Guidelines, Nicolle et al, Clin Infect Dis 2005
http://www.idsociety.org/Organ_System/

Bacteriuria and Antimicrobial Use

Â So we have a positive urine culture: When should we use antibiotics?
Â Asymptomatic bacteriuria is a clinical definition
í No tests to guide you
í Even worse, the test results can mislead you
Â Pyuria, positive urine cultures

Trautner and Grigoryan, ID Clinics North America 2014

IDSA Guidelines for Asymptomatic Bacteriuria

Screening and treatment of asymptomatic bacteriuria not recommended for:
1. Non-pregnant women
2. Diabetic women
3. Elderly in the community or institutionalized
4. Persons with spinal cord injury
5. Patients with indwelling catheter

IDSA Guidelines, Nicolle et al, Clin Infect Dis 2005
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Risk of Obtaining Cultures with no Symptoms

<table>
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<th>Condition</th>
<th>Prevalence</th>
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<tr>
<td>Urinary catheter present in an asymptomatic patient</td>
<td>25-60%</td>
</tr>
<tr>
<td>Cloudy, odorous urine, sediments</td>
<td>15-40%</td>
</tr>
<tr>
<td>Inappropriate use of urine culture</td>
<td>23-69%</td>
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<tr>
<td>Inappropriate antimicrobial use</td>
<td>57%</td>
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<tr>
<td>More resistant organisms, <em>Clostridium difficile</em>, increased cost, patient harm</td>
<td>28%</td>
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*Age >70 years


Table 2: Prevalence of asymptomatic bacteriuria in selected populations.
What are the TRUE signs and symptoms of CAUTI?

- Fever
- Rigors
- Malaise/lethargy
- Flank pain or CVA tenderness
- Foul-smelling urine
- Acute hematuria
- Pelvic discomfort
- Change in urine color
- Cloudy urine

Why?

Chromically-catheterized patients have bacteriuria 98% of the time.

The Kicking CAUTI Intervention:

Key Components

1. Algorithm: make the guidelines “actionable”
   - Applicable to specific patients
   - Provide step-by-step instructions
2. Audit and feedback: interactive educational component
3. Targeted personnel
   - Providers who order urine cultures and antibiotics
4. Outcomes
   - Urine cultures ordered (primary)
   - Treatment of ASB with antibiotics (secondary)

Guidelines Should be Actionable

Kicking CAUTI

The No Knee-Jerk Antibiotics Campaign

A Guidelines-Based Approach to Kicking CAUTI

Urine Cultures Decreased 71% in Intervention Site (P<0.0001)

Urine Cultures

Baseline | Intervention | Maintenance

Comparison Site

Intervention Site

Antibiotic treatment of ASB also decreased significantly.
Which of these catheterized persons has a CAUTI?

- Mr. J, an 86 year old resident of a LTCF, has a chronic indwelling Foley. He refuses to eat for 2 days. His urine has clumps of material in the drainage tube and smells bad.

- Urinalysis shows 50 wbc/hpf and many bacteria.

What do we do with Mr. J?

- Mr. J, an 86 yo resident of a LTCF, has a chronic indwelling Foley. He refuses to eat for 2 days. His urine has clumps of material in the drainage tube and smells bad. Urinalysis shows 50 wbc/hpf and many bacteria.

- Suggestions:
  - Change the Foley to ensure no obstruction
  - Look for another cause of anorexia
  - Withhold antibiotics

Pyuria in a catheterized patient

- Nearly universal
- Cannot be used to distinguish CAUTI from CA-ABU
- The presence of pyuria is not an indication to treat CA-ABU
- The absence of pyuria in a symptomatic patient suggests diagnosis other than CAUTI
- Cloudy or malodorous urine also not useful to distinguish CAUTI from CA-ABU

Which of these catheterized persons has a CAUTI?

- Mrs. Y, who is still catheterized 48 hours after a difficult vaginal childbirth, now has a fever of 102. Her urine has 10 WBC/hpf.

- How do you determine if she has a CAUTI?
- Would you treat her with antibiotics?
What do we do with Mrs. Y?

- Mrs. Y, who is still catheterized 48 hours after a difficult vaginal childbirth, now has a fever of 102. Her urine has 10 WBC/hpf.
- Fever is consistent with pyelonephritis
  - Pregnant women are at higher risk for pyelonephritis
  - Fever also consistent with infected hematoma, endometritis, cholecystitis.
- Imaging studies, blood cultures, antibiotics clearly indicated.

What do we do with Mr. H?

- Mr. H, a 22 yo male hospitalized for fracture of the femur, has had a Foley catheter for 6 days. He is complaining of irritation from the catheter—specifically the tape on his leg is bothering him. His urine has 20WBC/hpf and 10^2 E. coli.
- Suggestions:
  - Tape irritation is not the same as dysuria
  - Remove the catheter
  - A foreign body is a nidus for infection
  - Normal voiding may clear the bacteriuria
  - Re-assess his symptoms

Which of these catheterized persons has a CAUTI?

- Mr. H, 22 yo male hospitalized for fracture of the femur, has had a Foley catheter for 6 days. He is complaining of irritation from the catheter—specifically the tape on his leg is bothering him. His urine has 20WBC/hpf and 10^2 E. coli.
- What is the significance of 10^2 organisms?

Which of these catheterized persons has a CAUTI?

- Mr. W, an 82 yo male with nephrolithiasis, a left nephrostomy tube, and 2 episodes of recurrent Pseudomonas urosepsis in the past 2 years is admitted for nausea and malaise. His urine has visible clumps and grows Pseudomonas resistant to all antibiotics except amikacin (per computer report).
- How do we manage this patient?
What do we do with Mr. W?
Think first, antibiotics later

- Does he have symptoms consistent with CAUTI?
- Check the guidelines
- “Malaise or lethargy with no other identified cause”
- In prior episodes of urosepsis, he had fever and back pain
- Does he have another explanation for his current symptoms?
- Admission labs revealed a sodium of 112
- Treat the hyponatremia, withhold antibiotics

NSHN surveillance criteria

- CAUTI and UTI in acute care
  - Symptomatic UTI: CAUTI and non-CAUTI
    - CAUTI: catheter, fever, positive culture
  - UTI: fever (or symptoms), positive culture
- Asymptomatic bacteremic UTI
  - No urinary symptoms (but fever), positive urine and blood cultures
- CAUTI and UTI in LTC
  - Modified McGee criteria for surveillance
  - Loeb minimum criteria for antibiotic use

Case review

Case review: Symptoms Identified

- Discuss symptoms identified
  - Guideline concordant symptoms
  - Guideline discordant
- Diagnostic challenges
  - Concomitant infections

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Case Review

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- Diagnostic challenges
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Group Activity: Designing an antimicrobial stewardship program

- Two activities, two groups each
  - Chartering the project
  - Data and measurement
- 30 minutes to brainstorm and plan
- 10 minutes for report out

Group Activity: Designing an antimicrobial stewardship program

- Chartering the project
  - Identify a champion
  - Define team membership
  - Choose a target population
  - Address buy in
    - Leadership
    - Participants
    - Patients
  - Draft a charter

Group Activity: Designing an antimicrobial stewardship program

- Data and measurement
  - Define outcomes
  - Determine how you will measure outcomes
  - Determine how to record the data
    - Who, when, how
  - Decide who will receive the data
    - When (frequency)
    - How (mode of delivery)

Report out and next steps