Antimicrobial Stewardship in Long-Term Care Facilities: Focus on Suspected UTI

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DISCLOSURES

There are no conflicts of interest to disclose. I, Margery Shane DNP, FNP-BC, did not receive any fees or funding from any person, company, or organization. Any mention of brand or generic names in this lecture is not an endorsement or advertisement for the brand or company.
INTRODUCTION

Antimicrobial resistance

• Major public health problem
• Becoming more common
• Severe consequences of infection with resistant organisms
Investigate the effect of an educational intervention on nurse practitioners’ knowledge regarding antimicrobial stewardship in long term care facilities, focusing on suspected UTI.
LEARNING OBJECTIVES

DEFINE
antimicrobial resistance

DIFFERENTIATE
between UTI and asymptomatic bacteriuria

IDENTIFY
methods for diagnosis, communication, and surveillance

UTILIZE
the AHRQ Suspected UTI SBAR communication tool
PICO / CLINICAL QUESTION

P – Nurse practitioners practicing in long term care facility setting
I – Antimicrobial stewardship eLearning module [Independent Variable]
C – Knowledge (pre/post-test) [Dependent Variable]
O – Increased antimicrobial stewardship knowledge.

Does antimicrobial stewardship education increase knowledge of nurse practitioners in long term care settings?
BACKGROUND

• Antimicrobial stewardship
• Common prescribing practices
• Frequency of antimicrobial prescription
FACTORS INFLUENCING ANTIBIOTIC PRESCRIBING IN LTCFs

- Relationship with the patient
- “On-call duty”, Prescriptions ordered over the telephone
- Delay in obtaining microbiology results for urine samples
- Dependence on urine dipstick results
- Difficulty collecting clean catch urine specimens
- Comorbid conditions
- Influence of nursing staff in LTCFs
- Quality of communication between nurses and providers
- Influence of family
- Fear of ill consequences.21
SIGNIFICANCE

• **2,000,000** people in the United States are infected with antibiotic resistant infections each year.\(^5\)

• **23,000** of these people die as a result of infections caused by resistant organisms.\(^5\)
RISK FACTORS FOR ANTIBIOTIC RESISTANCE

**AGE**

Age-associated changes in adaptive and innate immunity may increase susceptibility to infections.\(^7\)

**COMORBIDITIES**

Multiple comorbidities increase risk of:
- Hospitalization
- invasive procedures
- prosthetic devices
- short term urinary catheterization.\(^7\)

**LTC**

Older adults are more likely to reside in long-term care facilities, exposing them to nosocomial pathogens and increasing the risk of acquiring MDROs.\(^7\)
**URINARY TRACT INFECTION**

### DEFINITIONS

**Symptomatic UTI**

in older adults is defined as: the presence of localized genitourinary symptoms, urinary tract inflammation as demonstrated by pyuria and a urine culture with an identified urinary pathogen.\(^9\)

**Pyuria**

Increased numbers of leukocytes in the urine (>10 WBC per high-powered microscopic urinary field). This is evidence of inflammatory response in the urinary tract.\(^9\)

**Complicated UTI**

Symptomatic UTI, involving the bladder or kidneys, in persons with functional or structural abnormalities of the genitourinary tract.\(^10\)

**Acute Uncomplicated UTI**

A symptomatic bladder infection characterized by frequency, urgency, dysuria, or suprapubic pain in a woman with a normal genitourinary tract.\(^10\)

**Acute Nonobstructive Pyelonephritis**

A renal infection characterized by CVA pain/tenderness often associated with fever. Occurs in the same population that experiences acute uncomplicated UTIs.\(^10\)
The Loeb Minimum Criteria\textsuperscript{11} (LMC) was developed in 2001 through expert consensus as a guide to help clinicians decide when to initiate antibiotics empirically.

The criteria were developed for clinically stable nursing home residents.

It is not meant as a management guideline, or to replace clinical judgement.
SIGNS AND SYMPTOMS OF UTI

LOEB MINIMUM CRITERIA

RESIDENTS *WITHOUT* AN INDWELLING CATHETER

- ACUTE DYSURIA
- FEVER (>100°F, OR A 2.4°F INCREASE ABOVE BASELINE TEMPERATURE)

*OR*

- ACUTE DYSURIA
- FEVER (>100°F, OR A 2.4°F INCREASE ABOVE BASELINE TEMPERATURE)

*AND* AT LEAST ONE OF THE FOLLOWING

NEW OR WORSENING:

- URGENCY
- FREQUENCY
- SUPRAPUBIC PAIN
- URINARY INCONTINENCE
- GROSS HEMATURIA
- CVA TENDERNESS

RESIDENTS *WITH* AN INDEWLLING CATHETER

AT LEAST *ONE* OF THE FOLLOWING:

- FEVER (100°F OR A 2.4°F INCREASE ABOVE BASELINE TEMPERATURE)
- NEW CVA TENDERNESS
- RIGORS
- NEW ONSET OF DELERIUM
ASYMPTOMATIC BACTERIURIA

Is defined as the presence of bacteria in the urine in quantities of $10^5$ cfu/mL or more in 2 consecutive urine specimens in women, or 1 urine specimen in men, in the absence of clinical signs and symptoms suggestive of a UTI.\(^7\)

In this context, the term asymptomatic includes bacteriuria in the presence of nonspecific, non-urinary symptoms (i.e.: malaise, fatigue, change in functional status.)\(^{10}\)
# ASYMPTOMATIC BACTERIURIA

<table>
<thead>
<tr>
<th>Population</th>
<th>Prevalence, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy premenopausal women</td>
<td>1-5</td>
</tr>
<tr>
<td>Diabetic patients</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>9-27</td>
</tr>
<tr>
<td>Men</td>
<td>0.7-11</td>
</tr>
<tr>
<td>Elderly persons in the community</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>10.8-16</td>
</tr>
<tr>
<td>Men</td>
<td>3.6-19</td>
</tr>
<tr>
<td>Elderly persons in a LTCF</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>25-50</td>
</tr>
<tr>
<td>Men</td>
<td>15-40</td>
</tr>
<tr>
<td>Patients with indwelling catheter use</td>
<td></td>
</tr>
<tr>
<td>Short-Term</td>
<td>9-23</td>
</tr>
<tr>
<td>Long-term</td>
<td>100</td>
</tr>
</tbody>
</table>

10. Infectious Diseases Society of America Guidelines for the Diagnosis and Treatment of Asymptomatic Bacteriuria in Adults | Clinical Infectious Diseases | Oxford Academic [Internet]. Available from: https://academic.oup.com/cid/article/40/5/643/363229
ASYMPTOMATIC BACTERIURIA

10%
Percentage of LTCF residents with fever and bacteriuria who actually have a UTI without any urinary symptoms.\textsuperscript{15}

50%
Percentage of LTCF residents with UTI in the presence of urinary symptoms, fever, and bacteriuria.\textsuperscript{15}

90%
Percentage of institutionalized elderly persons with bacteriuria who also have pyuria.\textsuperscript{15}

IDSA recommendation: (2005)
Screening for and treatment of asymptomatic bacteriuria in elderly institutionalized residents of LTCFs is \textit{NOT} recommended.
## ASYMPTOMATIC BACTERIURI A

### MANAGEMENT

<table>
<thead>
<tr>
<th>POPULATION</th>
<th>SCREENING</th>
<th>TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premenopausal, nonpregnant women</td>
<td>NOT INDICATED</td>
<td>NOT INDICATED</td>
</tr>
<tr>
<td>Diabetic women</td>
<td>NOT INDICATED</td>
<td>NOT INDICATED</td>
</tr>
<tr>
<td>Older persons residing in the community.</td>
<td>NOT RECOMMENDED</td>
<td>NOT RECOMMENDED</td>
</tr>
<tr>
<td>Elderly institutionalized residents of LTCFs</td>
<td>NOT RECOMMENDED</td>
<td>NOT RECOMMENDED</td>
</tr>
<tr>
<td>Individuals with spinal cord injuries</td>
<td>NOT RECOMMENDED</td>
<td>NOT RECOMMENDED</td>
</tr>
<tr>
<td>Individuals with indwelling urethral catheters: Short-term or long-term</td>
<td>NOT RECOMMENDED</td>
<td>NOT RECOMMENDED</td>
</tr>
<tr>
<td>Individuals undergoing traumatic genitourinary procedures with mucosal bleeding, i.e.: TURP</td>
<td>RECOMMENDED</td>
<td>INITIATE PRIOR TO PROCEDURE</td>
</tr>
</tbody>
</table>

WHAT IS ANTIBIOTIC STEWARDSHIP?

Antibiotic stewardship refers to a set of commitments and activities designed to optimize the treatment of infections while minimizing the adverse events associated with antibiotic use.22

- Antibiotic stewardship seeks to minimize inappropriate and unnecessary use of antibiotics.23
STEWARDSHIP IS A TEAM EFFORT

As of November 2017, CMS requires all LTCFs to establish an antibiotic stewardship program.25

WHO IS ON OUR TEAM?

- Nursing home leadership (administrators, owners)
- Medical Director
- Director of Nursing
- Consultant pharmacists
- Consultant laboratory
- Consultant infectious disease specialists.
- Infection prevention program coordinator
- Providers
- Staff Nurses
- State and local health departments
AHRQ SUSPECTED UTI SBAR

Suspected UTI SBAR

Complete this form before contacting the resident’s physician.

Nursing Home Name ____________________________ Facility Fax ____________

Resident Name ____________________________ Date of Birth ________

Physician/NP/PA ____________________________ Phone ____________

Nurse ____________________________ Facility Phone ____________

Submitted by: □ Phone □ Fax □ In Person □ Other ________

■ Situation

I am contacting you about a suspected UTI for the above resident.

Vital Signs: BP ____________ HR ____________ Resp. rate ____________ Temp. ____________

■ Background

Active diagnoses or other symptoms (especially: bladder, kidney/gallbladder conditions)

Specify ________

□ No □ Yes The resident is on an indwelling catheter

□ No □ Yes The resident is on a dialysis

□ No □ Yes The resident is infants < 1 year of age

□ No □ Yes Advance directives for limited treatment related to antibiotics and/or hospitalizations

Specify ________

□ No □ Yes Medication Allergies

Specify ________

□ No □ Yes The resident is on Warfarin (Coumadin®)

Assessment Input (check all boxes that apply)

Resident WITH Indwelling Catheter

Criteria are met if one or all of the following are met

No Yes

□ Fever of 100°F (38°C) or higher

□ New back or flank pain

□ Acute pain

□ Signs/symptoms of bladder irritation

□ New change in mental status

□ Hypertension significant change from baseline BP or a systolic (SBP) > 40

Residents WITHOUT Indwelling Catheter

Criteria are met if one or all of the following are met

No Yes

□ 1. Acute dysuria/urination

□ 2. Signs of infection: temperature ≥ 100°F (38°C) or higher and at least one of the following: urgent, suprapubic/pubic tenderness, frequency, hematuria, back pain, fever, chills

□ 3. At least two or more of the following symptoms: urgent, suprapubic/pubic tenderness, frequency, gross hematuria

Nurse: Please check box to indicate whether or not criteria are met

□ Nursing home protocol criteria are met. Resident may require LA with C&S or an antibiotic.

□ Nursing home protocol criteria are NOT met. The resident does NOT need an immediate prescription for an antibiotic, but may need additional observation.

Request for Physician/NP/PA Orders

Orders were provided by physician through: □ Phone □ Fax □ In Person □ Other ________

□ Give LA

□ Give culture

□ Encourage ____________ ounces of liquid intake ____________ times daily calling is light yellow in color

□ Restart oral intake

□ Assess vital signs for ____________ days, including every ____________ hours for ____________ hours.

□ Notify Physician/NP/PA if symptoms worsen or if unresponsive in ____________ hours.

□ Initiate the following antibiotic

□ Dose: ____________ Route: ____________ Duration: ____________

□ Other

Physician/NP/PA signature ____________________________ Date/Time ____________

□ No □ Yes Physician to adjust for renal function

□ Done

Physician/NP/PA signature ____________________________ Date/Time ____________

Family/NH notified ( festivities): ____________ Date/Time ____________
# RESULTS

## Paired Samples Statistic

<table>
<thead>
<tr>
<th>s</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of correct pre-test answers</td>
<td>6.40</td>
<td>10</td>
<td>1.350</td>
<td>0.427</td>
</tr>
<tr>
<td>Number of correct post-test answers</td>
<td>8.10</td>
<td>10</td>
<td>1.197</td>
<td>0.379</td>
</tr>
</tbody>
</table>

## Paired Samples Test

<table>
<thead>
<tr>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>95% CI of the differences (Lower)</th>
<th>95% CI of the differences (Upper)</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.7</td>
<td>1.494</td>
<td>0.473</td>
<td>0.631</td>
<td>2.769</td>
<td>3.597</td>
<td>9</td>
<td>0.006</td>
</tr>
</tbody>
</table>
1. Antibiotic resistance is a major public health burden.

2. Residents of LTCFs are at particular risk due to age, comorbid conditions, and institutionalized living.

3. Urinary tract infection is the most common diagnosis for which antibiotics are prescribed in long-term care facilities.

4. Antibiotics are often prescribed inappropriately, for a diagnosis of UTI, although asymptomatic, due to the high prevalence of asymptomatic bacteriuria in this population.
THANKS FOR YOUR ATTENTION
Access the full e-Learning video here: https://youtu.be/GF68x43KV-A

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REFERENCES

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