Optimizing Care for Suspected Urinary Tract Infection

Danielle Backus, Assistant Professor, Pacific University
Sharon Leigh, Clinical Pharmacy Supervisor, Providence ElderPlace
Conflict of Interest

• Drs. Backus and Leigh have no conflicts of interest to disclose
Introduction

• Who is here today?

• Does your PACE have an antimicrobial stewardship program?

• Is your PACE associated with a health-system? (for access to inpatient and antimicrobial labs)
Learning Objectives

1. Describe the barriers to optimal diagnosis and treatment of suspected urinary tract infections for older adults.

2. Utilize the materials in the Agency for Healthcare Research and Quality suspected UTI SBAR Toolkit to improve communication of urinary tract symptoms for a provided patient case.

3. Begin creating a preliminary plan for implementation of this process at your Program of All-Inclusive Care for the Elderly.
Urinary Tract Infection

Barriers to optimal diagnosis
Barriers to optimal diagnosis and treatment

- Fear of urosepsis
- Pressure to prescribe
  - “Positive” urinalanalysis
- Off-site prescribers
- Patient communication barriers
**Asymptomatic Bacteriuria**

Bacteria lives in urinary tract, but not invading the tissues
- Urinary tract is “colonized”
- Patient does not exhibit s/s of infection
- Urine culture may be positive
  - Colony count may be $>100,000$

**Urinary Tract Infection**

Bacteria invading tissues
- S/S of infection
  - Positive lab culture
  - Fever
  - Elevated WBC count
  - Inflammation
Colonization vs. Infection

- Positive Culture = Bacteriuria
- IDSA Definition of Bacteriuria:
  - Clean Catch:
    - >100,000 CFU/mL of 1 pathogen x2 samples for females
    - >100,000 CFU/mL of 1 pathogen x1 sample for males
  - Straight Catheterization
    - >100 CFU/mL of 1 pathogen x1 for both
- Bacteriuria present in both ASB and UTI
  - ASB = No UTI-specific symptoms
  - UTI = UTI-specific symptoms
UTI-Specific Symptoms

- Acute, marked increase in urinary frequency
- Acute, marked increase of incontinence
- Suprapubic pain
- Dysuria
- Costovertebral tenderness
- Gross hematuria
- Flank pain/tenderness
Loeb: Minimum Criteria for Starting ABX

**No Long-Term Indwelling Catheter**

- Acute dysuria
- OR
- Temp >37.9°C (100°F) or 1.5°C (2.4°F) above baseline AND ≥ 1 UTI-specific symptom

**With Long-Term Indwelling Catheter**

At least one:
- Rigors
- Temp >37.9°C (100°F) or 1.5°C (2.4°F) above baseline
- New onset delirium
- New costovertebral angle tenderness
• Both Criteria 1 and 2 must be met:
  o 1. At least 1 of the following s/s:
    • **Dysuria** OR acute pain, swelling, tenderness of the testes, epididymis, or prostate
    • Fever or leukocytosis **AND** at least 1 localized s/s
    • If no fever or leukocytosis, then 2 or more localized s/s
  o 2. One of the following:
    • \( \geq 10^5 \) CFU/mL of \( \leq 2 \) organisms in voided urine
    • \( \geq 10^2 \) CFU/mL of any # organisms in a catheter sample
      • In/out catheter, not a swab from indwelling catheter
Pop Quiz!

Can you use the results of a urinalysis to confirm a “positive” culture?
Urinalysis:

- (+) UA ≠ (+) UTI
  - A positive UA means that a C&S may be warranted
- (-) UA = (-) UTI
  - A negative UA means the patient does NOT have bacteriuria

- Pyruria (pus in the urine)
  - Present in up to 90% of patients with ASB
- “Positive” UA is hard to ignore
  - Typically sent for C&S
    - “Positive” culture harder to ignore
  - Only order a UA if patient has UTI-specific symptoms
- Do not obtain baseline UA or baseline urine cultures
  - Per IDSA – leads to inappropriate antimicrobial therapy
Confusion or Altered Mental Status

AMS has a myriad of causes:

- Dehydration
- Hypoglycemia
- Meds
- Blood loss or Anemia
- Other Infection
- Delirium
- Insomnia
- Depression
- Depression
Treatment of UTI
# Adverse Effects of Antimicrobials

## Nitrofurantoin

- **Considered first-line for UTI from *E. coli***
  - Limited *E. coli* resistance nation-wide
  - Only used for UTI, so use is not as common as other abx
- **Highly eliminated by kidneys into the urine**
  - Cannot use if CrCl <30 mL/min; on Beers Criteria
- **Adverse effects (risks increased if CrCl <30 mL/min)**
  - Hepatotoxicity
  - Optic neuritis
  - Peripheral neuropathy
  - Pulmonary toxicity
Adverse Effects of Antimicrobials

Fluoroquinolones (ciprofloxacin, levofloxacin)

- Reserve for complicated urinary tract infections
- Significant resistance
- Significant adverse effects (Multiple FDA warnings)
  - Hypoglycemia
    - More common in elderly
  - Mental health disturbances
    - Inattention, disorientation, agitation, nervousness, memory impairment, delirium
  - Peripheral neuropathy
  - Tendonitis and tendon rupture
  - Nephrotoxicity
    - Acute interstitial nephritis, crystallization in tubules

https://www.fda.gov/newsevents/newsroom/pressannouncements/ucm612995.htm
Sulfamethoxazole/Trimethoprim combination

- Reserve for targeted therapy
  - After isolate is known to be susceptible
- Can cause significant nephrotoxicity
  - Sulfamethoxazole
    - Acute allergic nephritis, crystallization in tubules
  - Trimethoprim
    - Hyperkalemia
    - Risk higher for elderly with impaired renal function who are taking ACE-Ils or ARBs
Adverse Effects of Antimicrobials

- Allergic responses
- Special administration concerns
  - Take with food to limit nausea/vomiting
  - May need to separate from other meds to limit interactions
- Antibiotic-related diarrhea
  - Can cause dehydration
  - Increases risk for fecal incontinence/skin breakdown
- *Clostridium difficile* superinfection
  - *C. dif* invades the gut after “good” flora are killed
  - Causes significant diarrhea, can be life-threatening
  - Requires treatment with appropriate antibiotic
Inappropriate Treatment

• Treatment of ASB leads to:
  o Antimicrobial resistance
    • Surviving bacteria pass on mechanisms of resistance by multiplying
  o Colonization more difficult to treat pathogens
    • Treat for *E coli*, make room for new pathogens to invade (*Klebsiella pneumoniae, Pseudomonas aeruginosa*)
UTI Communication and Treatment
Addressing barriers to optimal care
Appropriate UTI Treatment

- Try fluids first if UTI diagnosis uncertain
  - Patient may be dehydrated; adequate hydration may reverse some signs/symptoms and will help to flush out the bacteria
- Choose antimicrobial agent based on previous cultures and local resistance patterns
- If several options are viable, choose antimicrobials with most ideal side-effect profile
  - Nitrofurantoin preferred for uncomplicated UTI if renal function allows
Appropriate UTI Treatment

• Antibiogram
  o Document containing sensitivity of isolated bacterial strains to different antibiotics
    • Created by your laboratory; in-vitro sensitivity
  o Used to guide empiric antimicrobial therapy
  o If unable to create an antibiogram for your PACE
    • Ask for antibiogram of the hospital or health-system where your patients are most commonly admitted
    • Shared interest since you share patients; reduce antimicrobial resistance and healthcare associated infections within the health-system
### Appropriate UTI Treatment

<table>
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<th>Pathogen</th>
<th>Amik</th>
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<th>A/S</th>
<th>Cfh</th>
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<th>T/S</th>
<th>ESBL Rate</th>
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**Notes:**
- **:** Susceptible
- **:** Resistant
- ESBL: Extended-Spectrum Beta-Lactamase

**References:**
- <sup>1</sup> Source: [Journal of Antimicrobial Chemotherapy](https://academic.oup.com/jac)
- <sup>2</sup> Data from [Centers for Disease Control and Prevention](https://www.cdc.gov)
Appropriate UTI Treatment

Strategies to improve antimicrobial stewardship

• Utilize clinical pharmacists to assist with antimicrobial stewardship and pharmacotherapy selection

• Consult with health-system ID team to help setup an antimicrobial stewardship program

• Involve all leaders and healthcare providers of the PACE program in the process

• Set default length of therapy to 5 days

• Review a specific class of antibiotics on a pre-determined interval

Agency for Healthcare Research and Quality

• Nursing Home Antimicrobial Stewardship Guide
  o Includes 4 toolkits:
    • Implement, monitor, and sustain an Antimicrobial Stewardship Program
    • Determine whether it’s necessary to treat a potential infection with antibiotics
      • Suspected UTI SBAR
    • Help prescribing clinicians choose the right antibiotic for treating an infection
    • Educate and engage residents and family members
Suspected UTI SBAR

Use handout to review elements of the form

S: Situation
B: Background
A: Assessment
R: Recommendation
Suspected UTI SBAR

• SBAR form
  o Improve communication to decrease inappropriate antimicrobial prescribing
    • Reduce treatment for non-specific symptoms
  o Implement form or pieces of it within your PACE
    • Created for use in LTC facilities; modify for PACE
  o Let’s review the contents of the SBAR together
    • See your handout
Patient Case

Use handout to review patient and guide discussion
Patient Case

• Fill out the SBAR form for your patient
  o Are any parts of the form tripping you up?
  o Do you think your patient has a UTI?
Implementation

Use handout to guide discussion
Discussion

• What are the steps at your PACE before the prescriber finds out about a suspected UTI?
  o Who usually gets the call from a participant’s caregiver?

• What information are prescribers usually looking for when diagnosing/treating a UTI?

• Which antimicrobial stewardship processes have been successful at your PACE?
Create a plan

- Which antimicrobial stewardship processes would you like to implement or improve upon?
- Would a communication tool improve your antimicrobial prescribing?
  - Or are there improvements you could make to your current communication process?
- Who are the key players at your PACE?
- What barriers do you face?
  - Do you have strategies to share?
Thank you for your participation!

1. https://www.sidp.org/LTCStewardship