The UC Davis Antimicrobial Stewardship Program (ASP) was first established in 1986 and then expanded in pediatrics in 2011 and hospital wide in 2013 in response to the growing challenge of antibiotic resistance. Due to increasing antibiotic resistance, patients are at a higher risk for adverse effects and poor outcomes and treatment strategies become more complex.

Antibiotics are life-saving drugs and their use has important implications for patient care and public health. With this in mind, the UC Davis Health ASP strives to ensure all patients receive optimal antibiotic therapy when indicated. We thank you for your support in putting this very important program into action.

In This Issue

- UTIs: What You Need to Know
- Stewardship in the Time of COVID-19
- Test Your Knowledge
- ASP Gold Star Winners
- Meet the Stewardship Team
Urinary Tract Infections (UTI)

Diagnosis

- **First, ask about SYMPTOMS**
  - Acute cystitis: dysuria, frequency, urgency, suprapubic pain
  - Pyelonephritis: fever, flank pain
  - Catheter-associated UTI (CAUTI): main symptoms are subpubic pain and fever; patients with catheters may not report dysuria, frequency, or urgency
- If a person has symptoms, obtain a urinalysis (UA) and culture
  - A positive UA shows evidence of inflammation (e.g., elevated white blood cells)
  - A positive urine culture is defined as ≥10,000-100,000 CFU/mL of a urinary pathogen (≥1,000 in patients with urinary catheters)
  - A positive culture in the absence of symptoms does not benefit from treatment in most cases
- If a chronic indwelling catheter is in place, remove and replace it **before** sending UA and culture

Treatment

Assess prior urine culture data, as previous susceptibility patterns can help guide antibiotic choice.

- **Uncomplicated acute cystitis** (cystitis in a female without urologic abnormality or catheter):
  - Oral therapy preferred; avoid fluoroquinolones
  - Nitrofurantoin 100 mg PO BID (preferred)
  - Cephalexin 500 mg PO TID
  - TMP/SMX 1 DS tab PO BID
  - Fosfomycin 3 g sachet x 1

- **Uncomplicated pyelonephritis in women**
  - Fluoroquinolones and trimethoprim/sulfamethoxazole are preferred given excellent penetration into the kidney when the isolate is susceptible
  - Levofoxacin 750 mg PO daily (preferred)
  - TMP/SMX 1-2 DS tabs PO BID
  - Ceftriaxone 1 g IV q24h or Cefepime 1 q IV q8h depending on whether nosocomial

- **Complicated UTI** (UTI occurring in the presence of urologic abnormality, pregnancy, or urinary catheter or UTI in men)
  - UTI in men in the absence of obstructive pathology (e.g., renal stone, stricture, enlarged prostate) or urinary catheter is **uncommon**
  - Remove and do not replace urinary catheters whenever possible
  - Nitrofurantoin 100 mg PO BID
  - Ceftriaxone 1 g IV q24h or Cefepime 1 q IV q8h depending on whether nosocomial
  - TMP/SMX 1 DS tab PO BID

Duration

<table>
<thead>
<tr>
<th>Uncomplicated acute cystitis</th>
<th>Nitrofurantoin or cephalosporin: 5 days</th>
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<tbody>
<tr>
<td></td>
<td>TMP/SMX: 3 days</td>
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<tr>
<td></td>
<td>Fosfomycin: 1 day</td>
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<tr>
<td>Uncomplicated pyelonephritis</td>
<td>Fluoroquinolone: 5-7 days</td>
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<td>IV and Oral cephalosporins: 10-14 days (shorter course if early response)</td>
</tr>
<tr>
<td>Complicated UTI (including CAUTI)</td>
<td>Nitrofurantoin or cephalosporin: 10-14 days (7 days if entire course IV)</td>
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<tr>
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<td>TMP/SMX: 7 days</td>
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<tr>
<td></td>
<td>Fluoroquinolone: 5-7 days</td>
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</tbody>
</table>
References


Co-infections up front?1
- Not common
- Approximately 3%
  - Mix of community respiratory and bacterial pathogens

Co-infections later on?2
- Possible
- Approximately 10% overall
  - Mostly in higher acuity pts
  - Common HAI pathogens

Procalcitonin1
- Typically negative in viral dz
- Can be positive in the setting of severe COVID-19
  - PPV only 9%, NPV 98%
- Positive tests not reliable to guide abx management

What About CAPA?3,4
(COVID-19 Associated Pulmonary Aspergillosis)
- Incidence unclear
  - Possible regional variation
- Mostly critically ill
  - Mostly delayed-onset
  - Primarily A. fumigatus
- ID consult for voriconazole


Meet the Stewardship Team

Dr. Naomi Houser started as a faculty member in Infectious Diseases at UC Davis in August 2020 and works in both inpatient and outpatient settings and on the Infection Prevention team. She completed her ID fellowship in 2020 at the University of Maryland in Baltimore, MD, and internal medicine residency at Roger Williams Medical Center in Providence, RI. Her interests include infectious disease as it relates to climate change and other anthropogenic environmental changes, infection control and prevention, and zoonotic disease. Outside of work, she enjoys running, camping, and hiking with her dog.

If you see Dr. Houser, say hi to one of the new members of the team!
Test Your Knowledge

Would you like to win a $10 gift certificate to the Sunshine Café? Complete the following post-newsletter quiz and submit to hs-ASP@ucdavis.edu to be entered into a raffle for a free lunch!

A 63-year-old female with Type II diabetes is seen in the ED following 24 hours of vomiting and dysuria. She is hemodynamically and afebrile. Exam is notable for some right-sided CVA tenderness, but she is otherwise non-toxic appearing. Her CBC is unremarkable, and she is discharged home.

1. What empiric antibiotic course is most appropriate for this patient?
   a. Nitrofurantoin 100 mg PO BID x 10-14 days
   b. Fosfomycin 3 g sachet PO x 1
   c. Levofloxacin 750 mg PO daily x 5-7 days

2. True or False: A urine culture growing >100,000 CFUs of *Pseudomonas aeruginosa* in a stable patient with a foley catheter (bladder catheter was switched out prior to obtaining the culture) and no fever or localizing symptoms still requires treatment with antibiotics to prevent complications.

3. When should urine cultures be obtained in a patient with a foley catheter in place?
   a. When the urine appears cloudy / foul smelling & after the catheter has been replaced
   b. When symptoms suggestive of a UTI are present & after the catheter has been replaced
   c. Immediately when symptoms suggestive of a UTI are present to prevent delay

4. True or False: An elevated procalcitonin in a newly admitted patient with COVID-19 indicates bacterial co-infection and a need to start antibiotics?

Answers to last Newsletter’s quiz: 1. D, 2. True, 3. C., 4. A

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ASP Gold Star Winners for January 2021

The Antimicrobial Stewardship team would like to recognize Jason Lau for his dedication to combatting antimicrobial resistance and commitment to the principles of antimicrobial stewardship:

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Fun Microbe Fact:

*Cupriavidus metallidurans* thrives in environments rich with heavy metals which are typically toxic to most other bacteria. To survive these harsh environments it produces an enzyme, CopA, which takes one particular mineral, aqueous gold, and precipitates it back into its non-toxic metallic form. The end result is tiny, harmless gold particles which contribute to the formation of secondary deposits that form as a part of the weathering process of geologically created primary ores.
Contact Us

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Antibiotic questions? Contact us.

See the On-Call Schedule for the ASP attending/fellow of the day

Contact the ASP Pharmacist at 916-703-4099 or by Vocera "Infectious Disease Pharmacist"