A petri dish containing agar with various bacterial colonies and streaks, creating an artistic pattern. The background is a solid blue color. In the bottom left corner of the blue area, there is a small white icon of a microscope and the text 'asm.org' in white.

UC Davis Health Antimicrobial Stewardship Program

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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.

Image: Agar art submitted by Isabel Araque and Jenny Oñate to the 2020 ASM contest. <https://asm.org/Events/ASM-Agar-Art-Contest/2020-Winners>

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Community-Acquired Pneumonia (CAP)

Diagnosis

- Most patients have fever, cough and sputum production; many will also have chills (50%), tachypnea (45%), or pleuritic chest pain (30%)
- If symptoms are present, a chest x-ray (CXR) should be obtained; the absence of an infiltrate makes the diagnosis unlikely
- Infiltrate on CXR or chest CT without signs and symptoms of CAP is unlikely to represent CAP
- Microbiology: *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Legionella pneumophila*
- Obtain sputum culture and *S. pneumoniae* urinary Ag for those with severe disease or risk factors for resistance
- Obtain *Legionella* urinary Ag for those with severe disease or significant immunocompromise
- Obtain blood cultures for those with severe disease or with evidence of parapneumonic effusion
- Obtain viral respiratory testing or PCT during respiratory virus season if it will change care

Treatment

• Empiric therapy

- Cover for *S. pneumoniae*, *H. influenzae*, *Legionella*
- Avoidance of antibiotics with strong association with *Clostridium difficile* infection is recommended (e.g., fluoroquinolones > ceftriaxone > ampicillin/sulbactam)
- In patient with a recent respiratory viral infection presenting with new pneumonia, coverage for *Staphylococcus aureus*, including methicillin-resistant *S. aureus* (MRSA) in addition to standard CAP antibiotics should be considered
- Consider coverage for *Pseudomonas aeruginosa* if patient is from a long-term care facility or has significant immunocompromise
- Ceftriaxone 2 g IV q24h + Doxycycline 100 mg IV/PO q12h
- If high risk for MRSA: add vancomycin
- If high risk for *Pseudomonas*: change ceftriaxone to cefepime 2 g IV q8hrs
- If severe PCN allergy: Levofloxacin 750 mg IV/PO q24h

• Narrowing and oral therapy

- Use sputum culture results to narrow therapy; if organism is susceptible to ampicillin or if the *S. pneumoniae* urinary antigen is positive, switch to ampicillin (IV) or amoxicillin (PO)
- Stop azithromycin after 3 days unless treating *Legionella*
- If cultures are negative or not obtained, narrow to amoxicillin/clavulanate or oral third-generation cephalosporins (reserve fluoroquinolones for severe PCN allergy)
- In most cases, stop antibiotics if viral respiratory testing is positive
- After clinical improvement is observed, convert from intravenous to oral therapy
- Amoxicillin/clavulanate 2 g PO BID
- If severe PCN allergy: Levofloxacin 750 mg PO q24h
 - The fluoroquinolones are associated with greater *C difficile* and side effects risks

Duration

- 5 days if clinical response by day 3 for most patients
- 7 days if patient is immunocompromised, has underlying structural lung disease, or did not have clinical response by day 3
- If the patient has *Legionella*, *P. aeruginosa*, or *S. aureus*, longer durations of therapy are usually required, particularly if there is associated bacteremia

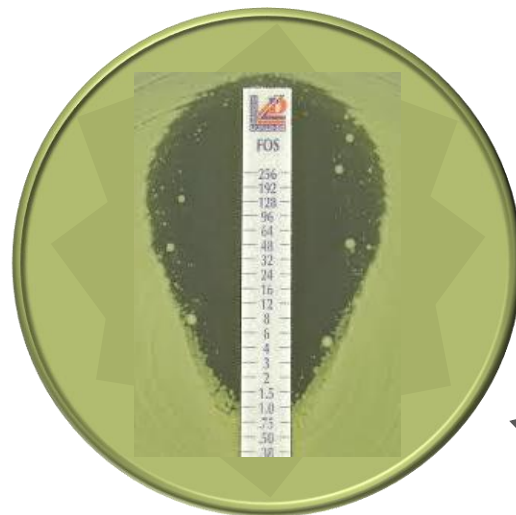
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Fosfomycin for MDR UTIs

Fosfomycin

- An oral antibiotic for UTIs
- Novel mechanism of action
- Effective against:
 - Most *Enterobacterales*
 - Most *Enterococci*
- **Not on most automated antibiotic testing panels**



an E-test strip

As of March 1st, 2021...

- Microbiology Lab will reflexively perform E-testing on all **ESBLs, CRE, and VRE** obtained in the outpatient setting
- Results will typically appear the next day in the susceptibility report
- Fosfomycin E-testing may also be requested on a case-by-case basis when necessary due to drug allergy, toxicity, etc.

ESBL = Extended spectrum beta-lactamase, CRE = Carbapenem resistant Enterobacterales, VRE = Vancomycin-resistant Enterococci

Meet the Stewardship Team

James Go is the most recent addition/return to the Infectious Diseases Pharmacy team here at UC Davis Health. He completed his PGY1 residency at the University of Kentucky and stayed on to complete his PGY2 in Infectious Diseases. He serves as a pharmacy preceptor for the ID Consult and Antimicrobial Stewardship rotations. His areas of interest include gram-negative mechanisms of resistance and HIV. Outside of the hospital setting, James can be found looking for "guinea pigs" to try his baking/cooking, keeping active with sports such as tennis and volleyball, and jet-setting.

If you see Dr. Go, say hi to one of the newest 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 cough and shortness of breath. She is hemodynamically stable, but febrile to 101 °F. Exam is notable for some lower right-sided crackles on auscultation of her lungs, but she is otherwise non-toxic appearing. Her CBC is unremarkable. She is admitted overnight for observation.

1. What empiric antibiotic course is most appropriate for this patient?
 - a. Cefepime 2 g IV q8h + Vancomycin 15 mg/kg IV x 1
 - b. Ceftriaxone 2 g IV q24h + Doxycycline 100 mg IV/PO q12h
 - c. Ciprofloxacin 500 mg PO q12h
2. True or False: In patients with uncomplicated pneumonia and no risk factors for drug resistance, a respiratory fluoroquinolone will have the same *C difficile* and side effect risks as amoxicillin-clavulanate with equal efficacy and easier compliance?
3. What is the duration of treatment for this patient's CAP assuming improvement by day 3?
 - a. 5 days
 - b. 7 days
 - c. 10 days
4. True or False: Fosfomycin is an effective oral option for uncomplicated, multidrug resistant (MDR) UTIs if found susceptible by laboratory testing.

Answers to last Newsletter's quiz: 1. C, 2. False, 3. B., 4. False



ASP Gold Star Winners for January 2021

The Antimicrobial Stewardship team would like to recognize **Daniel Trevino** for his dedication to combatting antimicrobial resistance and commitment to the principles of antimicrobial stewardship.

Fun Microbe Fact:

If you took all the microbes off and out of your body and put them in a bucket, they'd weigh about three pounds—almost as much as your brain.

<https://microbe.med.umich.edu/some-interesting-facts-missing-microbes>

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"