

UC Davis Health Antimicrobial Stewardship Program

Volume 6, Issue 1

January-February 2024

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: Bacillus subtilis colony seen using a fluorescence microscope.
<https://news.harvard.edu/gazette/story/2017/11/photos-reveal-strange-beauty-of-microbes/>*

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Diagnosis

- Clinical spectrum of infection ranges from watery diarrhea with lower abdominal pain, cramping, and nausea (with or without low-grade fevers and leukocytosis) to severe or fulminant colitis
- Case definition: \geq three unformed stools in a 24-hour period without an alternative explanation and positive stool test for *C. difficile*
- Patients with severe disease may have ileus without stool output; these patients generally have colitis on imaging, abdominal pain/distention, and systemic illness
- Nucleic acid tests detect the gene that produces the toxin that causes CDI but not the presence of the toxin itself; thus, given that up to 30% of hospitalized patients can be colonized with *C. difficile* but not actively infected, patients with positive nucleic acid tests who do not have symptoms consistent with CDI should not be treated for CDI
- 30% of patients have recurrent CDI within 30 days of treatment (retest to confirm the diagnosis)
- *C. difficile* testing recommendations
 - Do not test formed stool samples
 - Confirm patient has not received a laxative in the previous 48 hours
 - Do not test infants <1 year of age
 - Do not repeat testing within 7 days

Treatment

Discontinue antibiotics not used for CDI treatment whenever possible

If antibiotic therapy is still needed, select the narrowest agent possible and avoid agents with a strong association with CDI (i.e., fluoroquinolones, clindamycin, and third- and fourth-generation cephalosporins)

Discontinue gastric acid suppression medications whenever possible

Do not prescribe anti-motility agents

- **Non-severe CDI**
 - Adults: vancomycin (125 mg orally (PO) 4 times a day) or fidaxomicin for 10 days
 - Children: metronidazole (7.5 mg/kg/dose PO 4 times a day) or vancomycin (10 mg/kg PO 4 times a day) for 10 days
- **Severe (WBC \geq 15,000 cells/mL and/or serum creatinine \geq 1.5 mg/dL associated with CDI) or fulminant CDI (hypotension, intestinal perforation, toxic megacolon)**
 - Obtain abdominal imaging and prompt surgical consultation
 - Adults: vancomycin 125 mg PO/nasogastric tube (NG) 4 times a day for severe colitis; vancomycin 500 mg PO/NG 4 times per day for fulminant colitis for 10 days
 - Children: vancomycin 10 mg/kg/dose PO/NG 4 times a day for severe or fulminant colitis for 10 days
 - If ileus present, vancomycin can also be administered via rectum as a retention enema, along with metronidazole intravenously for 10 days

References

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C diff at UC Davis

Tests
Diagnosis
Treatment

What's Unique?

We screen all eligible adult patients upon admission for Clostridium difficile with a rectal swab PCR test. This test looks for C diff capable of producing toxin. It identifies colonization, not disease. Colonized patients are at greater risk for disease & transmission.

Things to know...

- A positive screening test should not be used for diagnosis & does not require a follow up diagnostic test in the absence of symptoms consistent with C diff infection (CDI)
- Colonized patients will be placed on "Contact Enteric" precautions for the duration of their hospital stay
- In the absence of CDI, colonized patients do not need to continue isolation precautions upon discharge or transfer to another facility
- Hand washing with soap and water is necessary for both colonized and infected patients to further reduce transmission

What's the Same?

Everything else.

- Diagnostic testing with "stool toxin EIA" is diagnostic in patients with signs and symptoms compatible with CDI. False positives are still possible, however, if:
<3 watery BMs/day... on stool softeners... on tube feeds... other causes present
- Given increases in community-onset C diff infection (CO-CDI) consider early diagnostic testing in those admitted complaining of diarrhea
- There is no utility in tests for cure or repeat testing if < 7 days from last negative test

Treat most 1st cases of CDI with:

Vancomycin 125 mg PO q6h x 10 days

Further guidance for recurrent or severe disease available on UCD's [ASP website](#)

Questions? Email hs-ASP@ucdavis.edu

Test Your Knowledge

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

A 50-year-old man presents to the ED with chest pain, and is found to have a NSTEMI. His admission C diff rectal swab PCR returns positive, and he is placed on Contact Enteric isolation. Also on admission for unclear reasons a urinalysis is obtained and returns positive for pyuria. He is started on ceftriaxone for UTI. On HD5 he develops 6 Bristol stool class 7 BMs, a new leukocytosis of 20k, and becomes hypotensive despite resuscitation requiring transfer to the ICU. A C diff stool toxin EIA is positive. This is his 1st episode of CDI.

1. What antibiotic is most appropriate at this time?
 - a. Fidaxomicin 200 mg PO daily
 - b. Vancomycin 500 mg PO q6hrs + Metronidazole 500 mg IV q8hrs
 - c. Vancomycin 125 mg PO q6hrs
 - d. Metronidazole 500 mg PO q8hrs
2. True or False: The patient's nurse asks whether he should have been treated upon admission because his screening swab was positive. Because the patient was not having any symptoms of CDI at the time, however, the patient was only colonized, and treatment was not indicated.
3. While reviewing the patient's chart you see he is also on pantoprazole. It was started a few years ago for heartburn and he has taken it ever since. The overnight resident had also started him on loperamide after his diarrhea started. He remains on ceftriaxone with no end date ordered. What additional interventions may improve outcomes?
 - a. Stop the patient's loperamide
 - b. Stop the patient's PPI
 - c. Stop the patient's ceftriaxone
 - d. Stop all the above

Answers to last Newsletter's quiz: 1. B, 2. T, 3. D, 4. T

ASP Gold Star Winners for Jan & Feb



The following staff have been recognized by the ASP team for their dedication to combatting antimicrobial resistance and commitment to the principles of antimicrobial stewardship:

- Lara Zimmerman (NCC)
- Laura Zimmerman (Acute Care)

Quick Antibiotic Fact:

Ampicillin / Amoxicillin

Ampicillin & Amoxicillin are the drugs of choice against susceptible Enterococci. Amoxicillin's 60-80% bioavailability also makes it a good choice for uncomplicated beta-hemolytic Strep infections.

Antibiotic Escape Room!



You're trapped!

You are forced to play a game of tic tac toe. Using the two rules below, who wins this round?

Tic Tac Toe

Ampicillin

Nitrofurantoin

Cefepime

If the organism is intrinsically resistant, X gets the spot.

Proteus mirabilis

Enterococcus faecalis

Otherwise, O gets the spot.

Pseudomonas aeruginosa

modified from:

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answer on last page...

Antibiotic Escape Room! Correction

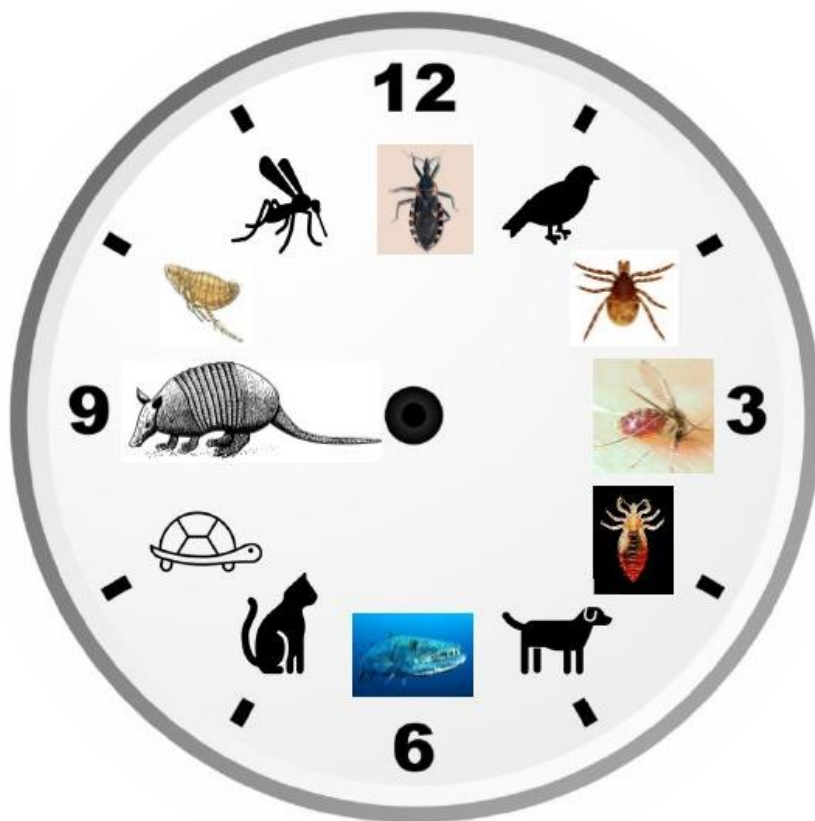
In our last ASP newsletter, the time was incorrectly listed as 3:45 when it should have been 12:45. The vector at 3:00 is the sand fly, source of Leishmania. The vector at 12:00 is the triatomine “kissing bug”, source of Chagas disease.

Thank you Dr. Metcalfe for identifying the error!

Hour hand points to the vector for Chaga’s disease

Minute hand points to an animal easily infected by *Mycobacterium leprae* given its low body temperature

What time
is it?



Contact Us

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Antibiotic questions? Contact us.

<https://health.ucdavis.edu/antibiotic-stewardship/>

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"

Escape Room answer: O