

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: "Dancing Microbes," Ana Tsitsishvili, Undergraduate Student, Agricultural University of Georgia, Tbilisi, Georgia. The white color is Staphylococcus epidermidis, the pink is Rhodotorula mucilaginosa, the yellow is Micrococcus luteus, and the green is Xanthomonas axonopodis.
Source: <https://asm.org/Events/ASM-Agar-Art-Contest/Previous-Winners>



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Cholecystitis and Cholangitis

Diagnosis

- Cholangitis: right upper quadrant (RUQ) pain (80%), fever (80%), jaundice (50%)
 - In the absence of signs and symptoms of infection, patients with jaundice or non-obstructing gallstones do not require antibiotics
- Acute cholecystitis: RUQ pain, fever, nausea/vomiting, usually in the presence of gallstones
 - In the absence of signs and symptoms of infection, patients with biliary colic (i.e., RUQ pain lasting 1-3 hours that resolves) do not require antibiotics
- Microbiology: *Escherichia coli*, *Klebsiella pneumoniae*, *Enterococcus spp.*
- Blood cultures should be obtained in all patients with cholangitis
- Blood cultures should be obtained in patients with cholecystitis that have concomitant sepsis
- Bile cultures should be obtained if the biliary tree is accessed via endoscopic retrograde cholangiopancreatography (ERCP) or percutaneous drain

Treatment

- **Non-severely ill patients with community-acquired infections**
 - Coverage for *Enterobacteriaceae* spp. +/- anaerobes
 - Ceftriaxone +/- Metronidazole
 - Severe beta-lactam allergy: Levofloxacin +/- Metronidazole

Note: *Staphylococcus aureus*, *Pseudomonas aeruginosa* and anaerobes are generally not biliary pathogens and do not require empiric coverage in non-severely ill patients with community-acquired infections; *Enterococcus spp.* grow in the biliary tree but are of low virulence and do not require empiric coverage in this population.

- **Patients with severe infection, hospital-acquired infection, or prior extensive biliary tract manipulation**
 - Review any prior biliary cultures to target empiric therapy
 - Cefepime + Metronidazole
 - Severe beta-lactam allergy: Levofloxacin + Metronidazole
 - Consider piperacillin-tazobactam in patients with a history of recent abdominal surgery
 - Consider vancomycin in patients with risk factors for or known colonization with MRSA

Note: Broader coverage for *P. aeruginosa*, resistant enterics, and anaerobes is necessary for severely ill, hospital-acquired, and prior biliary tract manipulation cases. Consider additional coverage for *Enterococcus spp.* and *Staphylococcus aureus* in patients at risk

- **Narrowing and oral therapy**
 - Narrow based on available culture data
 - Consider transition to oral therapy when clinical improvement (usually by 48–72 hours) and source control are achieved
 - Oral therapy can be used for bacteremia if agents with good oral bioavailability are chosen (e.g., trimethoprim-sulfamethoxazole, fluoroquinolones, metronidazole)

Duration

Acute cholangitis and source control	3 days after source control
Acute cholangitis and source control with concomitant bacteremia	7 days
Uncomplicated acute cholecystitis, medical management, clinical response	7 days
Uncomplicated acute cholecystitis, surgical management	No antibiotics after surgery
Complicated acute cholecystitis (e.g., perforation, fistula), surgical management for source control	4 days after surgery

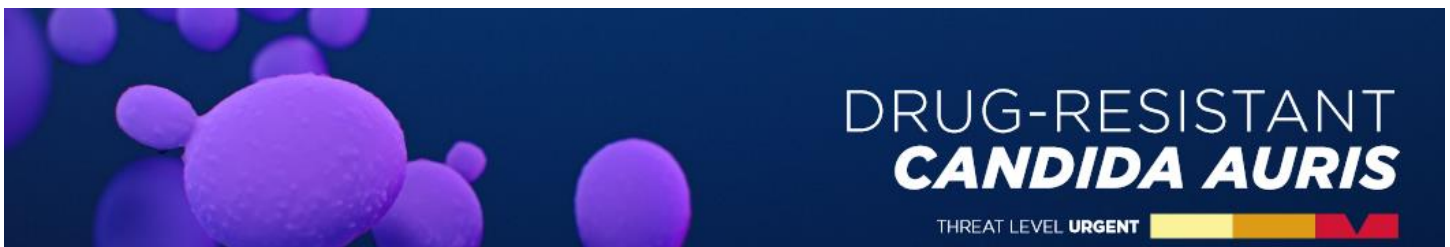
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Carbapenem-Resistant *Acinetobacter* (**CRAB**) can survive a long time on surfaces. Nearly all Carbapenem-resistant *Acinetobacter* infections happen in patients who recently received care in a healthcare facility. **Outbreaks of new strains producing OXA-23 carbapenemases have been occurring in California.** Most have been non-susceptible to all commonly used antibiotics.

Patients found to be infected or colonized with CRAB require Contact Isolation indefinitely given both the potential for patient-to-patient transmission and the limited treatment options when present. Screening of high-risk patients is in the works at UC Davis and will be coming soon.



Candida auris is an emerging multidrug-resistant yeast. It can cause severe infections and spreads easily between hospitalized patients and nursing home residents. **Outbreaks have been occurring nationwide including now throughout California.** Some isolates have been found to be non-susceptible to all commonly used antifungals.

Patients found to be infected or colonized with CRAB require Contact Isolation indefinitely given both the potential for patient-to-patient transmission and the limited treatment options when present. Screening of high-risk patients is in the works at UC Davis and will be coming soon.

Source: from CDC. Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019.

Meet the Stewardship Team

Ritu Cheema is one of our pediatric ID faculty members who joined UC Davis in 2017. She completed her Pediatrics residency from Women & Children's Hospital, Buffalo in 2008 and Pediatric ID fellowship from University of Michigan, Ann Arbor in 2011. She has been involved in various aspects of clinical infectious diseases including clinical care, optimizing antimicrobial usage in hospital & outpatient clinics, participating in hospital infection prevention team, contributing to research via various clinical trials (newer antibiotics, vaccines), and developing guidelines/workflows (related to infections) to improve patient care. She enjoys nature and loves to spend time with her family in her free time.



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 45-year-old woman with no known allergies and without prior abdominal symptoms develops right upper quadrant pain, fever, leukocytosis, and nausea and vomiting. An abdominal ultrasound shows a distended gallbladder with wall thickening greater than 3 mm and a non-mobile 7mm stone visualized in the gallbladder neck.

1. What empiric antibiotics should be initiated at this time?
 - a. Ceftriaxone +/- Metronidazole
 - b. Cefepime +/- Metronidazole
 - c. Levofloxacin +/- Metronidazole
2. True or False: Blood cultures should be obtained in all patients with cholangitis and all patients with acute cholecystitis that have concomitant sepsis.
3. The following day the patient is feeling much better. She is afebrile and her leukocytosis has resolved. She declines surgery for her cholecystitis and wishes to be discharged home. How long should any empiric antibiotics that were started be continued?
 - a. Step down to a 7-day course of oral antibiotics given clinical improvement
 - b. Continue intravenous antibiotics for a 7-day course given clinical improvement
 - c. Step down to a 14-day course of oral antibiotics given no cholecystectomy
4. True or False: CRAB and *Candida auris* are extremely drug resistant organisms capable of nosocomial transmission thus requiring Contact Isolation at UCD to try and limit spread.

Answers to last Newsletter's quiz: 1. C, 2. False, 3. A., 4. T

ASP Gold Star Winners for September 2021



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:

- Victoria Oyewole (ICU)
- Sun Yim (Neuro)

Fun Microbe Fact:

By age three, each of us has acquired our own unique foundation of microbes. The makeup of this microbiota is relatively permanent throughout our lives.

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

Contact Us

The Antimicrobial Stewardship Program team members

Adult ASP Physicians:

Stuart Cohen, MD
Archana Maniar, MD
Sarah Waldman, MD
Scott Crabtree, MD
Natascha Tuznik, DO
Christian Sandrock, MD
Larissa May, MD
Angel Desai, MD
Naomi Hauser, MD
Alan Koff, MBBS

Pediatric ASP Physicians:

Natasha Nakra, MD
Jean Wiedeman, MD
Ritu Cheema, MD
Elizabeth Partridge, MD

ASP Pharmacists:

Monica Donnelley, PharmD
Nicola Clayton, PharmD
Jen Curello, PharmD
James Go, PharmD

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"