

Preserving the power of antibiotics

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Staphylococcus aureus - Antibiotics Test plate. Credit: CDC

Of the 10 million prescriptions for antibiotics that emergency department physicians in the U.S. write each year, many are prescribed for known viral infections such as acute bronchitis and upper respiratory

infections, which do not respond to antibiotics.

A one-year study at UC Davis Medical Center funded with a grant from the U.S. Centers for Disease Control and Prevention is working to reduce inappropriate antibiotic prescribing and preserve the microbe-fighting power of antibiotics.

Led by Larissa May, a UC Davis associate professor of emergency medicine and national expert on antibiotic stewardship, the study focuses on reducing [antibiotic prescriptions](#) for [acute bronchitis](#) in adults and upper [respiratory tract infections](#) in children - two common conditions seen in emergency and urgent-care settings that are often inappropriately treated with antibiotics.

"Seventy-five percent of adults with acute bronchitis and 45 percent of children with viral [upper respiratory infections](#) are treated with antibiotics in emergency departments nationwide even though we have good evidence that these infections will resolve on their own and should be managed with over-the-counter medications and other remedies designed to treat the symptoms," May said.

"The difficulty is that providers in emergency and urgent-care settings face unique challenges to decision-making, including frequent interruptions and the need make decisions quickly with limited information," she said.

To help physicians make better antibiotic-prescribing decisions without limiting the choices available, May is comparing the effectiveness of two interventions. One offers educational materials for patients and providers, an on-site physician champion, and monthly summaries of appropriate and inappropriate antibiotic prescribing practices to department leaders.

The second, more intensive intervention includes behavioral approaches that have successfully changed antibiotic-prescribing patterns in other health-care settings. These include personalized posters in patient care areas with physicians' photos and their signed public commitment to antibiotic stewardship, and monthly performance rankings for each physician identifying top and not-top performers for appropriate antibiotic prescribing.

"As ED physicians, we routinely prescribe antibiotics to treat a range of conditions, from [viral respiratory infections](#) to life-threatening bloodstream infections," she said. "But there is more we can do to effectively promote the judicious use of antibiotics.

"Our goal is to educate patients and their families about inappropriate use of antibiotics and the importance of following evidence-based guidelines for treatment to reach the national goal of reducing antibiotic resistant strains by 50 percent by 2020," she said.

For the study, May will enroll approximately 381 providers from the UC Davis and Harbor-UCLA adult and pediatric emergency departments, the Harbor-UCLA adult urgent care center, and Children's Hospital Colorado pediatric emergency department and five urgent-care centers who will be randomized to receive one of the antibiotic-prescribing interventions.

According to the CDC, antibiotic resistant bacteria cause two million illnesses and approximately 23,000 deaths in the U.S. each year, and a study May published earlier this year with collaborators nationwide in the *Journal of the American Medical Association* found inappropriate prescribing rates for [acute respiratory infections](#) are as high as 50 percent in U.S. emergency departments.

"Reducing unnecessary antibiotic use is critical to reduce antibiotic

resistance in the community," May said. "And adverse events related to antibiotic overuse, including serious allergic reactions and the development of secondary life-threatening antibiotic-associated infections such as *Clostridium difficile*, is an important patient-safety issue."

The CDC grant is one of 34 awarded to U.S. institutions to implement the tracking, prevention and antibiotic stewardship activities outlined in the National Action Plan for Combating Antibiotic-Resistant Bacteria.

"Antibiotics are life-saving medicines, but the overuse of antibiotics threatens their future effectiveness through the selection of resistance. As a means to promote the better use of [antibiotics](#), this project is an example of applied research that has the potential to produce innovative public health approaches to better combat [antibiotic resistance](#)," said Clifford McDonald, associate director of Science for CDC's Division of Healthcare Quality Promotion.

More information: Katherine E. Fleming-Dutra et al. Prevalence of Inappropriate Antibiotic Prescriptions Among US Ambulatory Care Visits, 2010-2011, *JAMA* (2016). [DOI: 10.1001/jama.2016.4151](https://doi.org/10.1001/jama.2016.4151)

Provided by UC Davis

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