

The Carolina Antimicrobial Stewardship Program (CASP) Annual Antibiotic Awareness Week Newsletter



A message from the Carolina Antimicrobial Stewardship Program...

Thank you for taking the time to read our Annual Antibiotic Awareness Week Newsletter! The goal of this newsletter is to inform you of our initiatives and inspire you to continue ensuring patient safety through antimicrobial stewardship.

The Carolina Antimicrobial Stewardship Program (CASP) works collaboratively to optimize patient care outcomes by promoting the effective use of antimicrobials. Services provided by CASP include antimicrobial therapy consultations, clinical interventions, clinical guideline and protocol development, and antimicrobial stewardship education. Antimicrobial resistance is a growing problem, and we are all part of the solution. CASP is committed to providing the support and tools needed for all clinicians to participate in antimicrobial stewardship activities.

What has the CASP been up to?

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Who are the members of the Carolina Antimicrobial Stewardship Program (CASP)?

The CASP and OPAT are joint programs between the Department of Pharmacy and the Divisions of Adult and Pediatric Infectious Diseases at UNC Medical Center. The main personnel involved are described below:

CASP Team

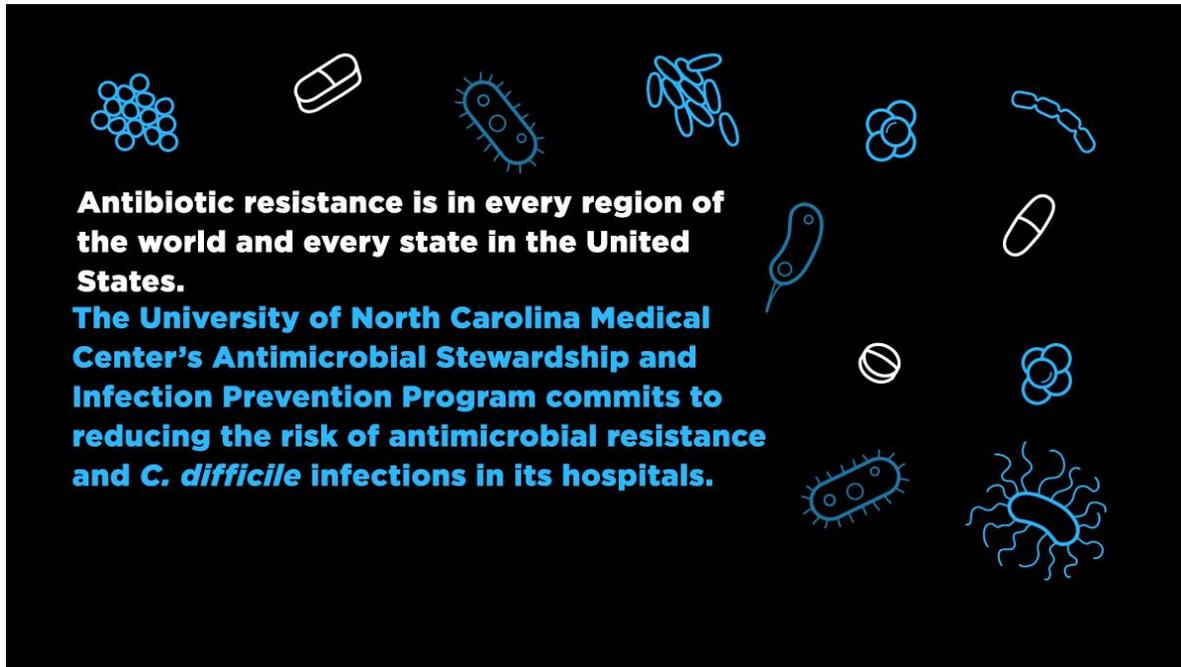
- Nikolaos Mavrogiorgos, MD- Co-Medical Director, Adult Infectious Diseases
- Jonathan J. Juliano, MD, MSPH- Co-Medical Director, Adult Infectious Diseases
- Lindsay Daniels, PharmD- Pharmacy Lead
- Zachary Willis, MD- Director of Pediatric Stewardship, Pediatric Infectious Diseases
- Emily Sickbert Bennett, PhD- Director, Hospital Epidemiology
- Melissa Miller, PhD- McLendon Clinical Laboratories
- Kayla Waldron, Pharm D- Clinical Manager, Department of Pharmacy
- Ashley Marx, PharmD- ID Pharmacist
- David Weber, MD- Adult Infectious Diseases
- Tom Belhorn, MD- Pediatric Infectious Diseases
- William Wilson, PharmD, BCPS- ID Pharmacist (Pediatrics)
- Jessica Lin, MD- Adult Infectious Diseases
- Jonathan Parr, MD- Adult Infectious Diseases
- Alan Kinlaw, PhD, MSPH- Epidemiologist, School of Pharmacy
- Emily Ciccone, MD- Advanced OPAT Fellow, Adult Infectious Diseases
- Michael Swartwood, BSN, RN, CAPM- Project Manager | Data Analyst

OPAT Leadership

- Claire Farel, MD- Co-Director, OPAT
- Nikolaos Mavrogiorgos, MD- Co-Director, OPAT

OPAT Team

- Renae Boerneke, Pharm D, CPP, BCPS- OPAT Pharmacist
- Emily Ciccone, MD, MHS- Advanced OPAT Fellow
- Markita Clark-Evans, MHA- Infectious Diseases Clinic Manager
- Claire Farel, MD, MPH- OPAT Physician
- Anita Holt, RN- OPAT Nurse Care Coordinator
- Bejal Kikani, MSN, FNP-BC, WHNP-BC- OPAT Nurse Practitioner
- Alan Kinlaw, PhD, MSPH- OPAT Epidemiologist, School of Pharmacy
- Nikolaos Mavrogiorgos, MD- OPAT Physician
- Suzy Rogers- OPAT Patient Coordinator
- Asher Schranz, MD- OPAT Physician
- Michael Swartwood, BSN, RN, CAPM- OPAT Program Manager | Data Manager



The CASP and the UNC Infection Prevention Program have joined the Centers for Diseases Control and Prevention's (CDC) Antimicrobial Resistance (AMR) Challenge, the U.S. government's yearlong effort to accelerate the fight against antimicrobial resistance across the globe. As part of this challenge, we have committed to preventing antimicrobial resistance and to enhancing patient safety by decreasing unnecessary antibiotic use and preventing hospital-acquired infections. For more information regarding the CDC's AMR Challenge, please click [here](#).



Advanced Standing in North Carolina STAR Partner's Initiative

North Carolina's Department of Health and Human Services recently launched the Stewardship of Antimicrobial Resources (STAR) Partners initiative. In order to address the critical need for optimizing antimicrobial use to improve patient care and limit antimicrobial resistance, the STAR initiative is partnering with health facilities statewide to both promote and implement stewardship interventions within their facilities, as well as mentor facilities that are newer to antimicrobial stewardship. Participation in the partnership requires meeting of the requirements for different levels of antimicrobial stewardship implementation. UNC Medical Center was awarded Advanced standing in recognition of our comprehensive antimicrobial stewardship program. UNCCMC is the only hospital in the Triangle region to achieve Advanced standing. UNCCMC will continue to collaborate with the State of North Carolina through this program to promote evidence based antimicrobial stewardship practices both in our hospital, as well as to help develop effective programs across the state.

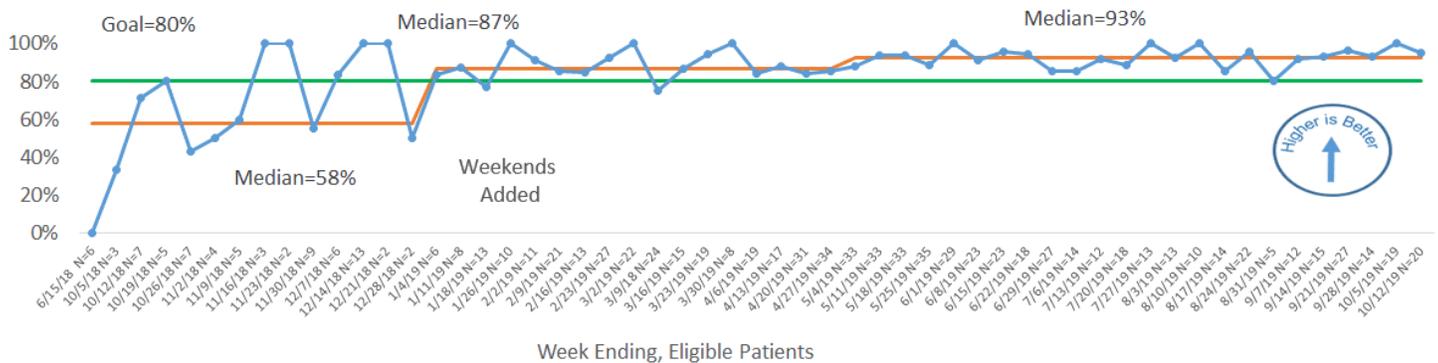
Antibiotic Time Outs: A Team-Driven Approach to Stewardship

The CDC recommends “antibiotic time outs,” a formal review by the care team of all antibiotic regimens 48 hours after they were started. Evidence suggests that time outs reduce antibiotic overuse by encouraging the transition from empiric to targeted antibiotics based on clinical and microbiologic data. In many instances, antibiotics can be discontinued entirely at 48 hours if culture results are negative at that point. This process should happen independently of the antimicrobial stewardship team and helps to engage all providers in stewardship.

The Carolina Antimicrobial Stewardship Program, led by Zach Willis, MD, MPH, of the Division of Pediatric Infectious Diseases, submitted a successful application for the UNC Institute for Healthcare Quality Improvement (IHQI) Quality Scholars Program. The aim was to implement antibiotic time outs on selected services, beginning with the medical teams at UNCCMC’s Hillsborough campus. IHQI provided expert project manager support and faculty coaching for the project. Pharmacists and hospitalists from Hillsborough joined the project team. In October 2018, two hospital medicine teams in Hillsborough began conducting time outs on all admitted patients receiving antibiotics for 36-72 hours. The participating teams quickly achieved the target of 80% of eligible patients having a documented time out. The project gradually spread to two additional hospital medicine teams in Hillsborough and then to two Family Medicine Teams in Chapel Hill by April 2019. It is currently being trialed by a pediatric hospital medicine team as well.

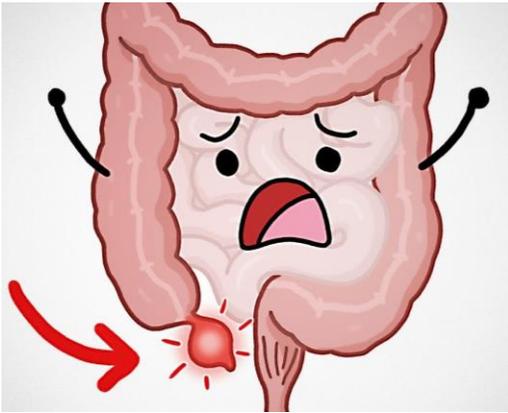
Dr. Willis presented the team’s results at the 2019 IHQI Improvement Scholars Symposium and at the 2019 Quality Expo. Participating teams continue to consistently perform time outs in over 80% of eligible patients. Approximately 35% of patients with a time out conducted have a change made to their antibiotic regimen, usually a significant de-escalation such as discontinuation or switch from IV to oral antibiotics.

Antibiotic time outs have the potential to make care safer by reducing exposure to potentially toxic antibiotics, decreasing the risk of *C. difficile* infection, and combating antibiotic resistance. The stewardship team plans to continue spreading the project across UNC Medical Center.



Percent Eligible Patients with an Antibiotic Time Out, N=848 Eligible Patients

Participating teams have consistently completed time outs in >80% of eligible patients (green line = target).



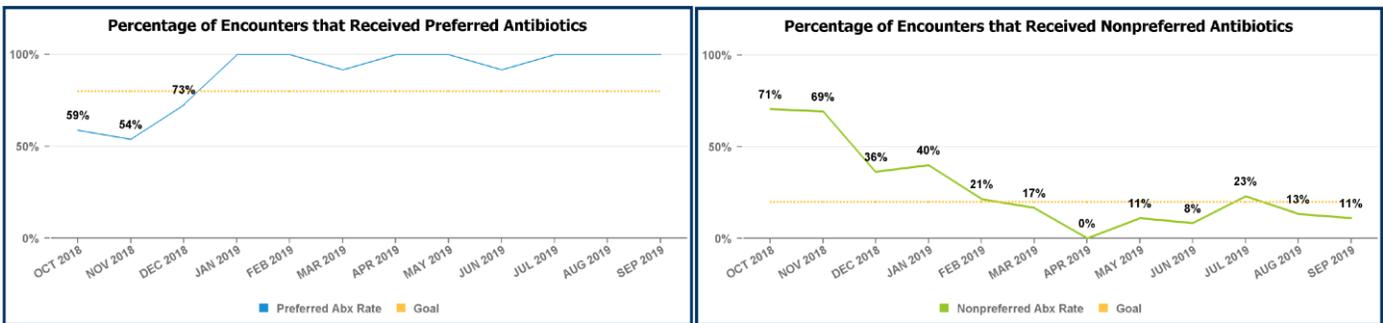
Pediatric Appendicitis: Collaboration, Optimization, and Automation

Recent clinical trials and observational studies of children with acute appendicitis have determined that an antibiotic regimen of ceftriaxone plus metronidazole is as effective as broader-spectrum regimens such as piperacillin-tazobactam or ertapenem. For children with complicated appendicitis (e.g., perforation or abscess at presentation), discharge with a brief oral antibiotic course reduces infectious complications and readmissions. We identified an opportunity to align our management of children with appendicitis with these evidence-based best practices, thereby

reducing the use of unnecessarily broad-spectrum antibiotics in UNC Children’s Hospital. We anticipated that infectious complications and readmissions would not change or would be reduced.

Goals of this multidisciplinary initiative included: establishing a pathway for appropriate management of pediatric appendicitis; reducing exposure to broad-spectrum antibiotics in accordance with published data; and creating an electronic tool that automatically monitors adherence to preferred antibiotics (e.g., ceftriaxone and metronidazole).

Members of CASP collaborated with Dr. Dan Park from Pediatric Emergency Medicine, Dr. Mike Phillips from Pediatric Surgery, and their colleagues to develop the Pediatric Appendicitis Pathway, which standardizes the diagnosis, surgical management, and antibiotic treatment of appendicitis in children. Implementation and monitoring of this pathway began in November 2018. Initially, data collection was performed manually by a member of CASP. The Pharmacy Analytics team an automatically generated monitoring dashboard to enable just-in-time targeted feedback.



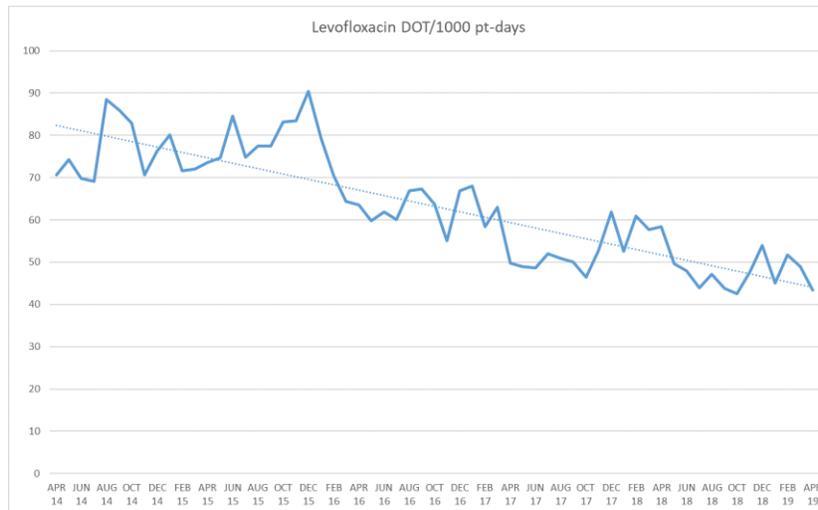
These data were presented by Bill Wilson, PharmD, at the 2019 Quality Expo. The pediatric appendicitis project helped prove that management pathways developed and implemented in a multidisciplinary fashion can be done successfully. This project also proved that engaging the Pharmacy Analytics Team can make monitoring of antibiotic regimens more efficient, allowing for consistent and timely feedback.

While members of this project will continually educate new residents to sustain adherence, they will also be exploring other disease states (e.g., community-acquired pneumonia) in a similar, multidisciplinary fashion.

Antibiotic Use Trends at UNC Medical Center: what's new?

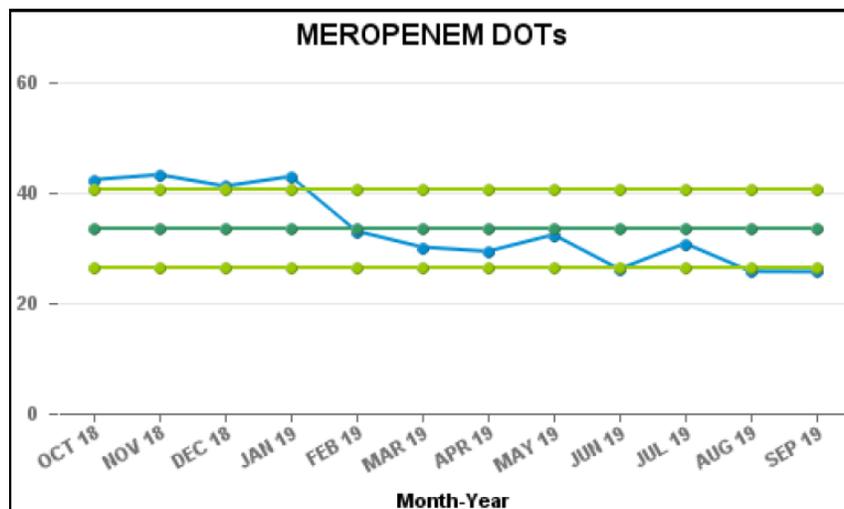
Fluoroquinolone Use

Over the last few years we have seen a significant decrease in fluoroquinolone use at UNC. This decrease is an exciting development because fluoroquinolones are often overused, and they have a number of significant side effects that have led to multiple black box warnings, such as risk of tendinopathy and tendon rupture, risk of peripheral neuropathy, and risk of aortic aneurysm rupture. In addition, they are associated with increased risk for *Clostridioides difficile* colitis compared to alternatives. While fluoroquinolones have a place in the treatment of serious bacterial infection, judicious use and avoidance of empiric use, when other safer antibiotics are available, is very important.



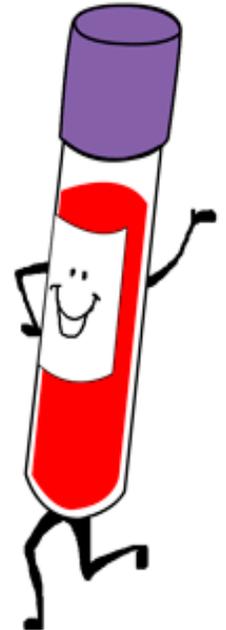
Carbapenem Use

Meropenem and other carbapenems are “last-line” antibiotics for highly resistant infections, making conservation critically important. Over the last year, we have seen a significant decrease in meropenem use, the most common carbapenem used at UNC. This coincided with closer prospective monitoring of meropenem use by members of CASP. Cases where meropenem is prescribed are reviewed by the stewardship team and suggestions for less broad antibiotics are being made when appropriate.



Rapid Staphylococcal Testing for Positive Blood Cultures

Last year the microbiology lab added rapid staphylococcal testing for positive blood cultures to the existing service for streptococci and enterococci. All positive blood cultures with Gram-positive cocci receive rapid molecular identification and resistance screening. Cultures positive for *S. aureus* are screened for methicillin resistance (*mecA*), and cultures positive for *Enterococcus* are screened for vancomycin resistance (*vanA/B*). Results are available approximately 3 hours after the blood culture becomes positive, which is significantly faster than the two days required using conventional laboratory methods. The ordering physician is notified by the laboratory when the culture is positive. Rapid test results are monitored by the Antimicrobial Stewardship Program, who then works with the treatment team if a change to therapy is warranted. The antimicrobial stewardship pager (216-2398) is available from 9 am – 5 pm on weekdays if additional assistance is needed.



Clostridioides difficile Diagnostic Stewardship: Different name, same game

The infectious diarrhea-causing pathogen formerly known as *Clostridium difficile* has a new name that has recently been adopted by the CDC as well as the Clinical and Laboratory Standards Institute (CLSI): *Clostridioides difficile*.

It may have a new name, but the same care should be used when evaluating, diagnosing, and treating a patient with *C. diff*. For a refresher on how to provide optimal care for patients with *C. diff*, checkout this infographic by clicking [here](#).

Introducing: the CASP Website!

The Carolina Antimicrobial Stewardship Program (CASP) launched a new website last year (<https://www.med.unc.edu/casp/>). The website includes information about CASP as well as the UNC OPAT (Outpatient Parenteral Antibiotic Therapy) program. It also includes a number of useful recourses, such as guidelines for the management of *Staphylococcus aureus* bacteremia, candidemia, dosing of antimicrobials, the process for referral to OPAT, easy access to the UNC antibiogram and much more. Check it out!



Recruiting Antimicrobial Stewardship Partners!

Thank you for taking the time to read our newsletter. Please take this brief survey to let us know how we can engage you more in Antimicrobial Stewardship and enter a prize drawing.

Survey link: https://unc.az1.qualtrics.com/jfe/form/SV_8FZFXQPCwKqIVyR



THANK YOU!



We would like to extend a huge “thank you!” to all of our Antimicrobial Stewardship Program partners, including (in no particular order):

Department of Pharmacy

Hospital Epidemiology

Infection Control Liaisons

Clinical Microbiology Laboratory

Division of Allergy and Immunology

Division of Pediatric Infectious Diseases

Division of Infectious Diseases and Global Health