



# Cystic Fibrosis Research News

## **Title:**

Finding the Relevance of Antimicrobial Stewardship for Cystic Fibrosis

## **Authors:**

Jonathan D. Cogen<sup>1</sup> MD MPH, Barbara C. Kahl MD<sup>2</sup>, Holly Maples PharmD<sup>3</sup>, Susanna A. McColley MD<sup>4</sup>, Jason A. Roberts<sup>5</sup>, Kevin L. Winthrop MD MPH<sup>6</sup>, Andrew M. Morris MD SM<sup>7</sup>, Alison Holmes MD MPH<sup>8</sup>, Patrick A. Flume MD<sup>9</sup>, Donald R. VanDevanter PhD<sup>10</sup>, Valerie Waters MD<sup>11</sup>, Marianne S. Muhlebach MD<sup>12</sup>, J. Stuart Elborn MD<sup>13</sup>, Lisa Saiman MD MPH<sup>14</sup>, Scott C. Bell MD<sup>15</sup> on behalf of the Antimicrobial Resistance International Working Group in Cystic Fibrosis

## **Affiliations:**

1. Division of Pulmonary & Sleep Medicine, Department of Pediatrics, University of Washington, Seattle, WA, USA
2. Institute of Medical Microbiology, University Hospital Münster, Münster, Germany
3. Department of Pharmacy Practice, University of Arkansas for Medical Sciences and Arkansas Children's Hospital, Little Rock, AR, USA
4. Division of Pulmonary and Sleep Medicine, Ann & Robert H. Lurie Children's Hospital of Chicago, and Northwestern University Feinberg School of Medicine, Chicago, IL, USA
5. University of Queensland Centre for Clinical Research and School of Pharmacy, The University of Queensland, Brisbane, Australia; Departments of Pharmacy and Intensive Care Medicine, Royal Brisbane and Women's Hospital, Brisbane, Australia; Division of Anaesthesiology, Critical Care, Emergency and Pain Medicine, Nîmes University Hospital, University of Montpellier, Nîmes France
6. Oregon Health and Science University School of Medicine and Public Health, Portland, Oregon, USA
7. Division of Infectious Diseases, Department of Medicine, Sinai Health, University Health Network, and University of Toronto, Toronto, Canada
8. National Institute for Health Research (NIHR) Health Protection Research Unit in Healthcare Associated Infections and Antimicrobial Resistance, Imperial College London, Hammersmith Campus, London, UK
9. Medical University of South Carolina, Charleston, SC, USA
10. Department of Pediatrics, Case Western Reserve University School of Medicine, Cleveland OH, USA
11. Division of Infectious Diseases, Hospital for Sick Children, University of Toronto, Toronto, Ontario, Canada.

**Cystic Fibrosis Research News**

[cfresearchnews@gmail.com](mailto:cfresearchnews@gmail.com)



# Cystic Fibrosis Research News

12. Department of Pediatrics, Division Pulmonology, University of North Carolina at Chapel Hill, NC, USA

13. Centre for Experimental Medicine, School of Medicine, Dentistry and Biomedical Sciences, Queen's University Belfast, Belfast, UK

14. Columbia University Irving Medical Center and New York-Presbyterian Hospital, New York, NY, USA

15. Department of Thoracic Medicine, The Prince Charles Hospital, and QIMR Berghofer Medical Research Institute, Brisbane, QLD, Australia

## **What was your research question?**

Antimicrobials are agents that kill microorganisms or stop their growth. Antimicrobial stewardship refers to guiding the individualized treatment of an infection, defining the need for treatment, and optimising antimicrobial choice, dose, and treatment duration while reducing the risk for toxicity and side effects. The purpose of this review is to describe how antimicrobial stewardship programs might benefit the care of people with CF. We explore the definition of and current evidence for antimicrobial stewardship programs as well as discuss how elements of CF care support with antimicrobial stewardship principles.

## **Why is this important?**

Antimicrobials are frequently used in the care of people with CF to treat both chronic (long term) and acute (new) respiratory infections. However, the use of antimicrobial therapy is also associated with the development of antimicrobial-resistant bacteria and difficult-to-treat infections. In addition, prolonged antimicrobial exposure is associated with important side effects, including hearing loss and kidney injury. Partnerships between CF care teams and antimicrobial stewardship programs can help determine when an antimicrobial is needed and an optimal dose and treatment duration with the goal of treating the infection and reducing any unwanted antimicrobial side-effects.

## **What did you do?**

This review defines an antimicrobial stewardship program and discusses specific antimicrobial stewardship approaches. In addition, this review looks at why antimicrobial stewardship is challenging in the care of a person with CF as well as the risks and consequences of antimicrobial use. Examples of CF care that align with antimicrobial stewardship programs and principles are discussed as are opportunities for antimicrobial stewardship in CF. Finally, this review examines potential research priorities for antimicrobial stewardship in CF and

**Cystic Fibrosis Research News**

[cfresearchnews@gmail.com](mailto:cfresearchnews@gmail.com)



# Cystic Fibrosis Research News

provides four case examples to illustrate challenges related to antimicrobial stewardship in CF care.

## **What did you find?**

Antimicrobials have played an enormous role in the improved outcomes of people with CF over the last several decades, and are recommended for eradication protocols, suppression of persistent respiratory microorganisms, and acute pulmonary exacerbation treatment. However, antimicrobial benefits must be weighed against the many well-described short- and long-term risks of antimicrobial administration to people with CF. Several current practices in CF treatment support collaboration between CF care teams and antimicrobial stewardship programs. These include partnerships with clinical microbiology laboratories for respiratory culture specimen collection, processing and reporting, the existence of several robust CF disease registries that allow for the longitudinal collection of demographic and clinical data, and the incorporation of CF-specific pharmacists into many CF clinical teams to provide antimicrobial dosing and therapeutic drug monitoring recommendations.

## **What does this mean and reasons for caution?**

While we have described the challenges related to antimicrobial stewardship in CF as well as opportunities for partnerships between antimicrobial stewardship and CF care teams, collaborations between these teams remain important and will likely lead to more appropriate use of antimicrobials. Currently, there are only a small number of studies in the literature that have assessed the benefits of antimicrobial stewardship in CF care.

## **What's next?**

More research is needed into how to best engage and communicate between CF and antimicrobial stewardship teams in order to build long-standing collaborations and improve antimicrobial utilization for people with CF. Evidence-based guidelines for the treatment of CF pulmonary disease with antimicrobials are greatly needed and should consider antimicrobial stewardship principles.

## **Original manuscript citation in PubMed**

[https://pubmed.ncbi.nlm.nih.gov/32122785/?from\\_single\\_result=Finding+the+Relevance+of+Antimicrobial+Stewardship+for+Cystic+Fibrosis&expanded\\_search\\_query=Finding+the+Relevance+of+Antimicrobial+Stewardship+for+Cystic+Fibrosis](https://pubmed.ncbi.nlm.nih.gov/32122785/?from_single_result=Finding+the+Relevance+of+Antimicrobial+Stewardship+for+Cystic+Fibrosis&expanded_search_query=Finding+the+Relevance+of+Antimicrobial+Stewardship+for+Cystic+Fibrosis)

**Cystic Fibrosis Research News**

[cfresearchnews@gmail.com](mailto:cfresearchnews@gmail.com)