

Ranking Antimicrobial Drugs According to Their Importance in Human Medicine

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Cornelius J. Clancy, MD
Chief, Infectious Diseases, VA Pittsburgh Healthcare System
Associate Chief, Infectious Diseases, University of Pittsburgh
IDSA Antimicrobial Resistance Committee



"There is an increasingly robust consensus that unnecessary use of antibiotics in animals and agriculture is a significant concern for human health."

—Jim O'Neill, The Review on Antimicrobial Resistance, May 2016

Criteria and the tier-based framework

Organization and rationale are clear and straightforward



Changes to criteria and tiers

Additional criteria that should be included among the criteria for ranking antimicrobials:

- the toxicity of an antimicrobial agent and the availability of better alternative therapies
- the potential for development of resistance to a drug or class of drugs



Application of criteria to antimicrobial classes

First Generation Cephalosporins

- -Sole or one of limited therapies
 - Cephalexin and cefadroxil: cellulitis and streptococcal pharyngitis
 - UTIs (fluoroquinolone and sulfa resistance rates)
 - Osteomyelitis and septic arthritis

Sources:

Stapleton A et al. *Escherichia coli* Resistance to Fluoroquinolones in Community-Acquired Uncomplicated Urinary Tract Infection in Women: a Systematic Review. Antimicrobial Agents and Chemotherapy Sep 2020. https://aac.asm.org/content/64/10/e00862-20.abstract

Wagenlehner, F.M., Naber, K.G. Understanding clinical variables to improve empirical antibiotic therapy for UTI. Nat Rev Urol 2019.

https://www.nature.com/articles/s41585-019-0240-0

Ramchandar N et al. Frequency of Dosing of Cephalexin for Oral Step-Down Therapy of Pediatric Osteoarticular Infections Caused by Methicillin-Sensitive *Staphylococcus Aureus*. The Pediatric Infectious Diseases Journal. June 2020.

https://journals.lww.com/pidj/Abstract/2020/06000/Frequency of Dosing of Cephalexin for Oral.13.aspx

Application of criteria to antimicrobial classes

Sulfonamides

- -Sole or one of limited therapies
- -Potential for development of resistance
 - Toxoplasmosis treatment

Source:

Zhang Y et al. Current treatment of ocular toxoplasmosis in immunocompetent patients: a network meta-analysis Acta Tropica. September 2018. https://www.sciencedirect.com/science/article/abs/pii/S0001706X17315267



Add additional: Category (antifungals) and Classes (azoles)

Clinical Infectious Diseases









Voriconazole Resistance and Mortality in Invasive Aspergillosis: A Multicenter Retrospective Cohort Study

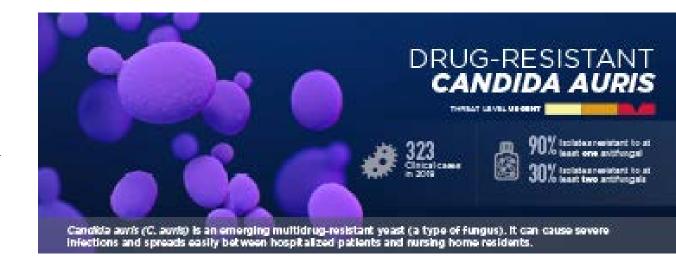
Pieter P. Lestrade, 1,2,1,6 Robbert G. Bentvelsen, 3,8 Alexander F. A. D. Schauwvlieghe, 4,8 Steven Schalekamp, 5 Walter J. F. M. van der Velden, 2,6 Ed J. Kuiper, 3 Judith van Paassen, 7 Ben van der Hoven, 8 Henrich A. van der Lee, 1,2 Willem J. G. Melchers, 1,2 Anton F. de Haan, 9 Hans L. van der Hoeven, 2,10 Bart J. A. Rijnders, 4 Martha T. van der Beek, 3 and Paul E. Verweij 1,2,0

¹Department of Medical Microbiology, Radboud University Medical Center, and ²Center of Expertise in Mycology Radboud University Medical Center/CWZ, Nijmegen, ³Department of Medical Microbiology, Leiden University Medical Center, ⁶Department of Medical Microbiology and Infectious Disease, Erasmus Medical Center, Rotterdam, Departments of ⁵Radiology and Nuclear Medicine and ⁶Hematology, Radboud University Medical Center, Nijmegen, ⁷Department of Intensive Care, Leiden University Medical Center, ⁸Department of Intensive Care, Erasmus Medical Center, Notterdam, and Departments of ⁹Health Evidence and ¹⁰Intensive Care, Radboud University Medical Center, Nijmegen, the Netherlands

Morbidity and Mortality Weekly Report

Multidrug-Resistant Aspergillus fumigatus Carrying Mutations Linked to Environmental Fungicide Exposure — Three States, 2010–2017

Karlyn D. Beer, PhD¹; Eileen C. Farnon, MD²; Seema Jain, MD³; Carol Jamerson⁴; Sarah Lineberger, MPH⁴; Jeffrey Miller, MD⁵,6; Elizabeth L. Berkow, PhD¹; Shawn R. Lockhart, PhD¹; Tom Chiller, MD¹; Brendan R. Jackson, MD¹



Updating the Ranking of Medically Important Antimicrobials

Review of data every two-three years

Formal updates every five years

Ability for medical experts to call for review as needed





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