

---

# Antimicrobial Resistance

Problem Pathogens and  
Clinical Countermeasures

---

edited by  
Robert C. Owens, Jr.  
Ebbing Lautenbach

**informa**  
healthcare

# Contents

Foreword Robert C. Moellering, Jr. v

Preface ix

Contributors xv

## Part I: Resistance Concerns for the Practicing Clinician: General Considerations

1. The Attributable Costs of Resistant Infections in Hospital Settings:  
Economic Theory and Application 1  
*R. Douglas Scott II and Rebecca R. Roberts*
2. Benchmarking: Its Utility in the Fight Against Antibacterial Resistance 25  
*Sujata M. Bhaonani and Glenn S. Tillotson*
3. Antibiotic Resistance: Opportunity or Obstacle for the  
Pharmaceutical Industry? 39  
*Glenn S. Tillotson*
4. Understanding Studies of Resistant Organisms: Focus on  
Epidemiological Methods 61  
*Ebbing Lautenbach*

## Part II: Contemporary Antimicrobial Resistance Issues: Gram-Positive, Gram-Negative, and Miscellaneous Pathogens

5. *Staphylococcus aureus*: Resistance Update and Treatment Options 75  
*Pamela A. Moise and George Sakoulas*
6. Enterococci: Resistance Update and Treatment Options 89  
*Peter K. Linden*
7. *Streptococcus pneumoniae*: Resistance Update and Treatment Options 111  
*Nicole Akar, William R. Bishai, and Sanjay K. Jain*
8. *Acinetobacter* Species: Resistance Update and Treatment Options 125  
*Lisa L. Maragakis and Trish M. Perl*
9. *Pseudomonas aeruginosa*: An Understanding of Resistance Issues 149  
*Karen Lolans, Maria Virginia Villegas, and John P. Quinn*
10. Problematic Beta-Lactamases: An Update 169  
*Marion S. Helfand and Louis B. Rice*

- 11.** *Clostridium difficile*-Infection: Overview and Update with a Focus on Antimicrobial Resistance as a Risk Factor 183  
*Robert C. Owens, Jr., August J. Valenti, and Mark H. Wilcox*
- 12.** Emerging Resistance Among *Candida* Species: Trends and Treatment Considerations for Candidemia 219  
*Ingi Lee and Theoklis Zaoutis*

### Part III: Interventional Strategies to Combat Resistance

- 13.** Early Appropriate Empiric Therapy and Antimicrobial De-Escalation 231  
*James M. Hollands, Scott T. Micek, Peggy S. McKinnon, and Marin H. Kollef*
- 14.** Antimicrobial Cycling Programs 251  
*Bernard C. Camins and Victoria J. Fraser*
- 15.** Antimicrobial Stewardship: Rationale for and Practical Considerations of Programmatic Institutional Efforts to Optimize Antimicrobial Use 261  
*Robert C. Owens, Jr.*
- 16.** Computer-Assisted Programs to Optimize Antimicrobial Use 301  
*Stanley L. Pestotnik and Jonathan B. Olson*
- 17.** Practical Application of Pharmacodynamic Principles to Optimize Therapy and Treat Resistant Organisms: A Focus on Beta-Lactam Antibiotics 317  
*Thomas P. Lodise, Ben M. Lomaestro, and George L. Drusano*
- 18.** Shorter Course Antibiotic Therapy (SCAT): Principles, Current Data, and Caveats 337  
*Donald E. Craven, Daniel P. McQuillen, Winnie W. Ooi, George A. Jacoby, Efen L. Rael, and Kathleen Steger Craven*
- 19.** Impact of Guidelines on Antimicrobial Treatment of Respiratory Tract Infections 371  
*Thomas M. File*
- 20.** The Impact of Hospital Epidemiology on the Management and Control of Antimicrobial Resistance: Issues and Controversies 397  
*August J. Valenti*
- 21.** Combination Antimicrobial Therapy for Gram-Negative Infections: What Is The Evidence? 433  
*Nasia Safdar and Cybele L. Abad*
- 22.** Antibiotic Resistance: Modern Principles and Management Strategies to Optimize Outpatient Use of Antibiotics 461  
*Sharon B. Meropol and Joshua P. Metlay*