

Cambridge University Press
978-1-107-03891-2 - Clinical Infectious Disease
Edited by David Schlossberg
Frontmatter
[More information](#)

Clinical Infectious Disease

SECOND EDITION

Cambridge University Press
978-1-107-03891-2 - Clinical Infectious Disease
Edited by David Schlossberg
Frontmatter
[More information](#)

Cambridge University Press
978-1-107-03891-2 - Clinical Infectious Disease
Edited by David Schlossberg
Frontmatter
[More information](#)

Clinical Infectious Disease

SECOND EDITION

Edited by

David Schlossberg, MD, FACP

Professor of Medicine, Temple University School of Medicine,
Adjunct Professor of Medicine, University of Pennsylvania
School of Medicine, and Director, Tuberculosis Control Program,
Philadelphia Department of Public Health, Philadelphia, PA



CAMBRIDGE
UNIVERSITY PRESS

Cambridge University Press
978-1-107-03891-2 - Clinical Infectious Disease
Edited by David Schlossberg
Frontmatter
[More information](#)

CAMBRIDGE
UNIVERSITY PRESS

University Printing House, Cambridge CB2 8BS, United Kingdom

Cambridge University Press is part of the University of Cambridge.

It furthers the University's mission by disseminating knowledge in the pursuit of education, learning, and research at the highest international levels of excellence.

www.cambridge.org

Information on this title: www.cambridge.org/9781107038912

© Cambridge University Press (2008) 2015

This publication is in copyright. Subject to statutory exception and to the provisions of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Cambridge University Press.

First edition published 2008

Second edition published 2015

Printed in Spain by Grafos SA, Arte sobre papel

A catalog record for this publication is available from the British Library

Library of Congress Cataloging in Publication data

Clinical infectious disease / [edited by] David Schlossberg. – Second edition.

p. ; cm.

Includes bibliographical references and index.

ISBN 978-1-107-03891-2 (Hardback)

I. Schlossberg, David, editor.

[DNLM: 1. Communicable Diseases. WC 100]

RC111

616.9–dc23 2014014736

ISBN 978-1-107-03891-2 Hardback

Cambridge University Press has no responsibility for the persistence or accuracy of URLs for external or third-party internet websites referred to in this publication, and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

.....

Every effort has been made in preparing this book to provide accurate and up-to-date information which is in accord with accepted standards and practice at the time of publication. Although case histories are drawn from actual cases, every effort has been made to disguise the identities of the individuals involved. Nevertheless, the authors, editors, and publishers can make no warranties that the information contained herein is totally free from error, not least because clinical standards are constantly changing through research and regulation. The authors, editors, and publishers therefore disclaim all liability for direct or consequential damages resulting from the use of material contained in this book. Readers are strongly advised to pay careful attention to information provided by the manufacturer of any drugs or equipment that they plan to use.

Cambridge University Press
978-1-107-03891-2 - Clinical Infectious Disease
Edited by David Schlossberg
Frontmatter
[More information](#)

This book is dedicated to Dr. Jonas A. Shulman, respected mentor and valued friend.
In the Sayings of the Fathers, we are advised:

עשה לך רב, וקנה לך חבר
Provide yourself a teacher; take for yourself a friend.

I was very lucky to find both in the same person.

Cambridge University Press
978-1-107-03891-2 - Clinical Infectious Disease
Edited by David Schlossberg
Frontmatter
[More information](#)

Contents

List of contributors	page xvii
Preface	xxxvii
Part I. Clinical syndromes: general	
1. Fever of unknown origin (FUO) <i>Cheston B. Cunha and Burke A. Cunha</i>	2
2. Sepsis, severe sepsis, and septic shock <i>Joseph Adrian L. Buensalido and Rodger D. MacArthur</i>	13
3. Chronic fatigue syndrome <i>N. Cary Engleberg</i>	24
Part II. Clinical syndromes: head and neck	
4. Pharyngotonsillitis <i>Itzhak Brook</i>	33
5. Infectious thyroiditis <i>Jeanne Carey and Stephen G. Baum</i>	42
6. Otitis media and externa <i>Stephen I. Pelton</i>	48
7. Sinusitis <i>Charles D. Bluestone and Todd D. Otteson</i>	59
8. Dental infection and its consequences <i>Bridget Hathaway, Jennifer Rubin Grandis, and Jonas T. Johnson</i>	63
9. Infection of the salivary and lacrimal glands <i>Zainab Alhamal, Mary Jordan, and Issam Raad</i>	68
10. Deep neck infections <i>Jeremy D. Gradon</i>	75
Part III. Clinical syndromes: eye	
11. Conjunctivitis <i>Elmer Y. Tu</i>	81
12. Keratitis <i>Elmer Y. Tu, Francis S. Mah, and Jules Baum</i>	88
13. Iritis <i>Alice Lorch and Ann-Marie Lobo</i>	97
14. Retinitis <i>Daniel M. Albert, Amol D. Kulkarni, and Amir A. Azari</i>	102
15. Endophthalmitis <i>Roy D. Brod, Harry W. Flynn Jr., and Lili G. Kaplan</i>	107
16. Periocular infections <i>Marlene L. Durand</i>	116

Part IV. Clinical syndromes: skin and lymph nodes

17. Fever and rash	122
<i>John W. Sensakovic and Leon G. Smith</i>	
18. Staphylococcal and streptococcal toxic shock and Kawasaki syndromes	127
<i>Aristides P. Assimacopoulos, Wilmara Salgado-Pabón, and Patrick M. Schlievert</i>	
19. Classic viral exanthems	133
<i>Lisa M. Chirch, Kevin D. Dieckhaus, and Jane M. Grant-Kels</i>	
20. Skin ulcer and pyoderma	139
<i>Joanne T. Maffei</i>	
21. Cellulitis and erysipelas	148
<i>Alok Vij and Kenneth J. Tomecki</i>	
22. Deep soft-tissue infections: necrotizing fasciitis and gas gangrene	153
<i>Stephen Ash and Louis E. Kennedy</i>	
23. Animal and human bites	157
<i>Ellie J. C. Goldstein and Fredrick M. Abrahamian</i>	
24. Scabies, lice, and myiasis	162
<i>Gentiane Monsel and Olivier Chosidow</i>	
25. Tungiasis and bed bugs	167
<i>Tania F. Cestari and Simone Pessato</i>	
26. Superficial fungal diseases of the hair, skin, and nails	171
<i>Gian L. Vinelli, Evelyn K. Koestenblatt, and Jeffrey M. Weinberg</i>	
27. Eumycetoma	180
<i>Ncoza C. Dlova, Anisa Mosam, and Antoinette Chateau</i>	
28. Lymphadenopathy/lymphadenitis	184
<i>Sheela Shenoi and Gerald Friedland</i>	

Part V. Clinical syndromes: respiratory tract

29. Acute bronchitis and acute exacerbations of chronic airways disease	193
<i>Phillippa Poole and Mark Hobbs</i>	
30. Croup, supraglottitis, and laryngitis	199
<i>Irmgard Behlau</i>	
31. Atypical pneumonia	205
<i>Thomas M. File, Jr.</i>	
32. Community-acquired pneumonia	214
<i>Keyur S. Vyas</i>	
33. Nosocomial pneumonia	221
<i>Burke A. Cunha</i>	
34. Aspiration pneumonia	226
<i>Suttirak Chaiwongkarjohn, Arash Heidari, Christopher J. Graber, and Matthew Bidwell Goetz</i>	
35. Lung abscess	233
<i>Lisa L. Dever</i>	
36. Empyema and bronchopleural fistula	237
<i>Charlotte E. Bolton and Dennis J. Shale</i>	

Part VI. Clinical syndromes: heart and blood vessels

37. Endocarditis of natural and prosthetic valves: treatment and prophylaxis	243
<i>Mashiul H. Chowdhury and Amanda M. Michael</i>	
38. Acute pericarditis	254
<i>Richard A. Martinello and Michael Cappello</i>	
39. Myocarditis	260
<i>Lori A. Blauwet</i>	

40. Mediastinitis	268
<i>Ravi Karra and Keith S. Kaye</i>	
41. Vascular infection	273
<i>Susan E. Beekmann and David K. Henderson</i>	
42. Infections of cardiovascular implantable electronic devices and VAD	280
<i>M. Rizwan Sohail and James M. Steckelberg</i>	

Part VII. Clinical syndromes: gastrointestinal tract, liver, and abdomen

43. Acute viral hepatitis	287
<i>Kalyan Ram Bhamidimarri and Paul Martin</i>	
44. Chronic hepatitis	296
<i>Michelle E. Freshman and Lawrence S. Friedman</i>	
45. Biliary infection: cholecystitis and cholangitis	308
<i>Robert V. Rege</i>	
46. Pyogenic liver abscess	314
<i>Patricia Wong and H. Franklin Herlong</i>	
47. Infectious complications of acute pancreatitis	317
<i>Jodie A. Barkin and Jamie S. Barkin</i>	
48. Esophageal infections	324
<i>Mark Flasar and Jean-Pierre Raufman</i>	
49. Gastroenteritis	334
<i>Douglas R. Morgan, Vivian Chidi, and Robert L. Owen</i>	
50. Food poisoning	342
<i>Carly R. Davis and Andrew T. Pavia</i>	
51. Antibiotic-associated diarrhea	349
<i>John G. Bartlett</i>	
52. Sexually transmitted enteric infections	352
<i>Thomas C. Quinn</i>	
53. Acute appendicitis	357
<i>Bian Wu and John Maa</i>	
54. Diverticulitis	361
<i>Ronald L. Nichols and James R. Korndorffer Jr</i>	
55. Abdominal abscess	366
<i>K. Shad Pharaon and Donald D. Trunkey</i>	
56. Splenic abscess	370
<i>Ross M. Clark and Thomas R. Howdieshell</i>	
57. Peritonitis	375
<i>Linda A. Slavoski and Matthew E. Levison</i>	
58. Whipple’s disease	381
<i>Amirkaveh Mojtahed and Payam Afshar</i>	

Part VIII. Clinical syndromes: genitourinary tract

59. Urethritis and dysuria	386
<i>George Pappas, Ioannis A. Bliziotis, and Matthew E. Falagas</i>	
60. Vaginitis and cervicitis	392
<i>Sebastian Faro</i>	
61. Epididymo-orchitis	401
<i>Suyin Chi and Thomas Fekete</i>	
62. Genital ulcer adenopathy syndrome	406
<i>Allan Ronald</i>	
63. Prostatitis	413
<i>Jonathan M. Zenilman</i>	

64. Pelvic inflammatory disease	418
<i>William J. Ledger</i>	
65. Urinary tract infection	421
<i>Keith W. Hamilton and Judith A. O'Donnell</i>	
66. Candiduria	430
<i>Jack D. Sobel</i>	
67. Focal renal infections and papillary necrosis	434
<i>David B. Banach and Louise M. Dembry</i>	

Part IX. Clinical syndromes: musculoskeletal system

68. Infection of native and prosthetic joints	440
<i>Shahbaz Hasan and James W. Smith</i>	
69. Bursitis	445
<i>Richard H. Parker</i>	
70. Acute and chronic osteomyelitis	448
<i>Ilona Kronig, Pierre Vaudaux, Domizio Suvà, Daniel Lew, and Ilker Uçkay</i>	
71. Polyarthritits and fever	454
<i>Kathryn H. Dao and John J. Cush</i>	
72. Infectious polymyositis	460
<i>Elizabeth Soda and Upinder Singh</i>	
73. Iliopsoas abscess	464
<i>Lisa M. Kodadek and Pamela A. Lipsett</i>	

Part X. Clinical syndromes: neurologic system

74. Bacterial meningitis	471
<i>Sarbjit S. Sandhu and Allan R. Tunkel</i>	
75. Aseptic meningitis syndrome	479
<i>Burt R. Meyers and Dalilah Restrepo</i>	
76. Acute viral encephalitis	487
<i>David N. Irani</i>	
77. Intracranial suppuration	495
<i>Brian Wispelwey and Scott K. Heysell</i>	
78. Spinal epidural abscess	504
<i>Mark J. DiNubile</i>	
79. Myelitis and peripheral neuropathy	510
<i>Jeffrey M. Percak and Rodrigo Hasbun</i>	
80. Reye syndrome	524
<i>Debra L. Weiner</i>	
81. Progressive multifocal leukoencephalopathy	529
<i>Joshua J. Chalkley and Joseph R. Berger</i>	
82. Cerebrospinal fluid shunt infections	536
<i>Elisabeth E. Adderson and Patricia M. Flynn</i>	
83. Prion diseases	541
<i>Richard T. Johnson</i>	

Part XI. The susceptible host

84. Evaluation of suspected immunodeficiency	545
<i>Thomas A. Fleisher</i>	
85. Infections in the neutropenic patient	551
<i>Eric Sachinwalla and Rafik Samuel</i>	
86. Infections in patients with neoplastic disease	558
<i>Amar Safdar and Donald Armstrong</i>	

87. Corticosteroids, cytotoxic agents, and infection	563
<i>Babafemi O. Taiwo and Robert L. Murphy</i>	
88. Biologics	567
<i>Pritha Sen and Jatin M. Vyas</i>	
89. Infections in transplant recipients	573
<i>Raymund R. Razonable</i>	
90. Diabetes and infection	585
<i>Stefan Bughi and Sylvia J. Shaw</i>	
91. Infectious complications in the injection and non-injection drug user	591
<i>Carlo Contoreggi</i>	
92. Infections in the alcoholic	597
<i>Laurel C. Preheim and Mir Akbar Ali</i>	
93. Infections in the elderly	603
<i>Kent Crossley</i>	
94. Neonatal infection	607
<i>Patrick G. Gallagher and Robert S. Baltimore</i>	
95. Pregnancy and the puerperium: infectious risks	615
<i>Raúl E. Istúriz and Jorge Murillo</i>	
96. Dialysis-related infection	622
<i>Peter Mariuz and Roy T. Steigbigel</i>	
97. Overwhelming postsplenectomy infection	629
<i>Larry I. Lutwick</i>	

Part XII. HIV

98. HIV infection: initial evaluation and monitoring	638
<i>Fouad Bouharb and Aaron E. Glatt</i>	
99. HIV infection: antiretroviral therapy	645
<i>Kathleen Squires and Christopher T. Miller</i>	
100. Immune reconstitution inflammatory syndrome (IRIS)	669
<i>Suzaan Marais and Graeme Meintjes</i>	
101. Differential diagnosis and management of HIV-associated opportunistic infections	676
<i>Anthony Ogedegbe and Marshall J. Glesby</i>	
102. Prophylaxis of opportunistic infections in HIV disease	688
<i>Amy S. Baranoski and Jeffrey M. Jacobson</i>	

Part XIII. Nosocomial infection

103. Prevention of healthcare-associated infections in staff and patients	698
<i>Karen Beydoun and Gonzalo Bearman</i>	
104. Percutaneous injury: risks and prevention	703
<i>David T. Kuhar</i>	
105. Hospital-acquired fever	709
<i>Susan K. Seo and Arthur E. Brown</i>	
106. Transfusion-related infection	712
<i>William R. Jarvis and Virginia R. Roth</i>	
107. Intravascular catheter-related infections	717
<i>Anne-Marie Chافتari and Issam Raad</i>	
108. Infections associated with urinary catheters	722
<i>Lindsay E. Nicolle</i>	

Part XIV. Infections related to surgery and trauma

109. Postoperative wound infections	729
<i>E. Patchen Dellinger</i>	

110. Trauma-related infection	734
<i>Mark A. Malangoni</i>	
111. Infected implants	738
<i>Gordon Dickinson and John C. Oeltjen</i>	
112. Infection in the burn-injured patient	741
<i>Roger W. Yurt and Rafael Gerardo Magaña</i>	

Part XV. Prevention of infection

113. Nonsurgical antimicrobial prophylaxis	746
<i>James P. Steinberg and Nadine G. Roupheal</i>	
114. Surgical prophylaxis	752
<i>Joseph S. Solomkin and Giorgio Tarchini</i>	
115. Immunizations	763
<i>Elaine C. Jong</i>	

Part XVI. Travel and recreation

116. Advice for travelers	778
<i>Henry M. Wu and Jessica K. Fairley</i>	
117. Fever in the returning traveler	785
<i>Alimuddin Zumla</i>	
118. Systemic infection from animals	790
<i>David J. Weber, Jonathan J. Juliano, and William A. Rutala</i>	
119. Tick-borne disease	797
<i>Steven C. Buckingham</i>	
120. Recreational water exposure	800
<i>Andrea K. Boggild and Mary Elizabeth Wilson</i>	
121. Travelers' diarrhea	810
<i>Karen J. Vigil and Herbert L. DuPont</i>	

Part XVII. Bioterrorism

122. Bioterrorism	815
<i>Andrew W. Artenstein</i>	

Part XVIII. Specific organisms: bacteria

123. Actinomycosis	829
<i>Thomas A. Russo and Rajinder P. S. Bajwa</i>	
124. Anaerobic infections	835
<i>Sydney M. Finegold</i>	
125. Anthrax and other <i>Bacillus</i> species	843
<i>Tirdad T. Zangeneh, Marc Traeger, and Stephen A. Klotz</i>	
126. <i>Bartonella bacilliformis</i>	850
<i>Nuria Sanchez Clemente</i>	
127. Cat scratch disease and other <i>Bartonella</i> infections	853
<i>William A. Schwartzman</i>	
128. <i>Bordetella</i>	859
<i>Sarah S. Long</i>	
129. <i>Branhamella</i> – <i>Moraxella</i>	863
<i>Lisa S. Hodges and Joseph A. Bocchini, Jr.</i>	
130. Brucellosis	866
<i>Carlos Carrillo and Eduardo Gotuzzo</i>	

131.	<i>Campylobacter</i>	870
	<i>David W. K. Acheson</i>	
132.	<i>Clostridium</i>	873
	<i>Derek Forster</i>	
133.	<i>Corynebacteria</i>	881
	<i>Carlos H. Ramírez-Ronda and Carlos R. Ramírez-Ramírez</i>	
134.	<i>Enterobacteriaceae</i>	888
	<i>L. W. Preston Church</i>	
135.	<i>Enterococcus</i>	895
	<i>Ronald N. Jones</i>	
136.	<i>Erysipelothrix</i>	901
	<i>W. Lee Hand</i>	
137.	<i>HACEK</i>	904
	<i>Vivian H. Chu</i>	
138.	<i>Helicobacter pylori</i>	907
	<i>David Y. Graham and Emiko Rimbara</i>	
139.	<i>Gonococcus: Neisseria gonorrhoeae</i>	915
	<i>Amy J. Mathers and Michael F. Rein</i>	
140.	<i>Haemophilus</i>	920
	<i>Timothy F. Murphy</i>	
141.	<i>Legionellosis</i>	924
	<i>Thomas J. Marrie</i>	
142.	<i>Leprosy</i>	931
	<i>Eduardo Castro-Echeverry, Thomas Lee, Travis Vandergriff, and Clay J. Cockerell</i>	
143.	<i>Meningococcus and miscellaneous neisseriae</i>	935
	<i>Chuen-Yen Lau and Edmund C. Tramont</i>	
144.	<i>Listeria</i>	942
	<i>Bennett Lorber</i>	
145.	<i>Nocardia</i>	950
	<i>Lisa Haglund</i>	
146.	<i>Pasteurella multocida</i>	954
	<i>Paulina A. Rebolledo, Naasha J. Talati, and David S. Stephens</i>	
147.	<i>Pneumococcus</i>	959
	<i>Maurice A. Mufson and Nancy B. Norton</i>	
148.	<i>Pseudomonas, Stenotrophomonas, and Burkholderia</i>	966
	<i>Titus L. Daniels and David W. Gregory</i>	
149.	<i>Rat-bite fevers</i>	975
	<i>Neil S. Lipman</i>	
150.	<i>Salmonella</i>	979
	<i>Bruce S. Ribner</i>	
151.	<i>Staphylococcus</i>	985
	<i>Suzanne F. Bradley</i>	
152.	<i>Streptococcus groups A, B, C, D, and G</i>	991
	<i>Dennis L. Stevens, J. Anthony Mebane, and Karl Madaras-Kelly</i>	
153.	<i>Viridans streptococci</i>	997
	<i>Caroline C. Johnson</i>	
154.	<i>Poststreptococcal immunologic complications</i>	1000
	<i>Barbara W. Stechenberg</i>	
155.	<i>Shigella</i>	1004
	<i>David W. K. Acheson</i>	
156.	<i>Tularemia</i>	1007
	<i>Kari A. Neemann and Jessica N. Snowden</i>	
157.	<i>Tuberculosis</i>	1010
	<i>Jay B. Mehta and Asim K. Dutt</i>	

158.	Nontuberculous mycobacteria	1020
	<i>Timothy Aksamit and David E. Griffith</i>	
159.	Vibrios	1030
	<i>Duc J. Vugia</i>	
160.	<i>Yersinia</i>	1034
	<i>Royce H. Johnson and Arash Heidari</i>	
161.	Miscellaneous gram-positive organisms	1037
	<i>Iqra Choudary, Steven K. Schmitt, and Roberto Baun Corales</i>	
162.	Miscellaneous gram-negative organisms	1044
	<i>Sampath Kumar and Kamaljit Singh</i>	

Part XIX. Specific organisms: spirochetes

163.	Syphilis and other treponematoses	1053
	<i>Arlene C. Seña and Adaora A. Adimora</i>	
164.	Lyme disease	1060
	<i>Janine Evans</i>	
165.	Relapsing fever borreliosis	1068
	<i>Sally J. Cutler</i>	
166.	Leptospirosis	1072
	<i>Christopher D. Huston</i>	

Part XX. Specific organisms: *Mycoplasma* and *Chlamydia*

167.	<i>Mycoplasma</i>	1076
	<i>Ken B. Waites</i>	
168.	<i>Chlamydia pneumoniae</i>	1086
	<i>Margaret R. Hammerschlag</i>	
169.	<i>Chlamydia psittaci</i> (psittacosis)	1089
	<i>Alfred E. Bacon III</i>	

Part XXI. Specific organisms: *Rickettsia*, *Ehrlichia*, and *Anaplasma*

170.	Rickettsial infections	1093
	<i>Paul D. Holtom</i>	
171.	Ehrlichiosis and anaplasmosis	1098
	<i>Johan S. Bakken and J. Stephen Dumler</i>	

Part XXII. Specific organisms: fungi

172.	Candidiasis	1104
	<i>Christopher F. Carpenter and Nicholas Gilpin</i>	
173.	Aspergillosis	1113
	<i>Sanjay Ram and Stuart M. Levitz</i>	
174.	Mucormycosis (and entomophthoromycosis)	1119
	<i>Scott F. Davies</i>	
175.	<i>Sporotrichum</i>	1124
	<i>Ronald A. Greenfield[†]</i>	
176.	<i>Cryptococcus</i>	1128
	<i>William G. Powderly</i>	
177.	Histoplasmosis	1134
	<i>Mitchell Goldman and Alvaro Lapitz</i>	
178.	Blastomycosis	1138
	<i>Peter G. Pappas</i>	

179.	Coccidioidomycosis	1141
	<i>Laurence F. Mirels and Stan Deresinski</i>	
180.	<i>Pneumocystis jirovecii</i> (carinii)	1151
	<i>Shelley A. Gilroy and Nicholas J. Bennett</i>	
181.	Miscellaneous fungi and algae	1156
	<i>Cheryll N. Cash and George A. Pankey</i>	

Part XXIII. Specific organisms: viruses

182.	Cytomegalovirus	1161
	<i>Rima I. El-Herte and Jeffery L. Meier</i>	
183.	Dengue	1168
	<i>Nguyen Thanh Hung</i>	
184.	Enteroviruses	1172
	<i>Michael N. Oxman</i>	
185.	Epstein–Barr virus and other causes of the mononucleosis syndrome	1183
	<i>Jeffery L. Meier</i>	
186.	Hantavirus cardiopulmonary syndrome in the Americas	1190
	<i>Gregory J. Mertz and Michelle J. Landiorio</i>	
187.	Herpes simplex viruses 1 and 2	1193
	<i>Richard J. Whitley</i>	
188.	Human herpesviruses 6, 7, 8	1199
	<i>Ruth M. Greenblatt</i>	
189.	Influenza	1205
	<i>Ramin Sedaghat Herati and Harvey M. Friedman</i>	
190.	Papillomavirus in oro-genital infection	1211
	<i>Lawrence J. Eron</i>	
191.	Acute and chronic parvovirus infection	1216
	<i>Neal S. Young</i>	
192.	Rabies	1220
	<i>Gloria von Geldern, Anita Mahadevan, Susarla K. Shankar, and Avindra Nath</i>	
193.	Varicella-zoster virus	1226
	<i>Jeffrey M. Weinberg</i>	
194.	Viral hemorrhagic fevers	1234
	<i>Daniel G. Bausch</i>	

Part XXIV. Specific organisms: parasites

195.	Intestinal roundworms	1250
	<i>Kathryn N. Suh and Jay S. Keystone</i>	
196.	Tissue nematodes	1258
	<i>Thomas A. Moore</i>	
197.	Schistosomes and other trematodes	1268
	<i>James H. Maguire</i>	
198.	Tapeworms (cestodes)	1274
	<i>Zbigniew S. Pawlowski</i>	
199.	<i>Toxoplasma</i>	1279
	<i>Roderick Go and Benjamin J. Luft</i>	
200.	Malaria	1285
	<i>Jessica K. Fairley and Henry M. Wu</i>	
201.	Human babesiosis	1295
	<i>Tempe K. Chen, Choukri Ben Mamoun, and Peter J. Krause</i>	
202.	Trypanosomiasis and leishmaniasis	1302
	<i>Anastácio de Queiroz Sousa, Selma M. B. Jeronimo, and Richard D. Pearson</i>	

203. Intestinal protozoa	1313
<i>Paul Kelly</i>	
204. Extraintestinal amebic infection	1318
<i>Robert Huang and Sharon L. Reed</i>	
Part XXV. Antimicrobial therapy: general considerations	
205. Principles of antibiotic therapy	1324
<i>John S. Czachor</i>	
206. Antibacterial agents	1333
<i>Richard R. Watkins</i>	
207. Antifungal therapy	1344
<i>Nathan P. Wiederhold and Thomas F. Patterson</i>	
208. Antiviral therapy	1353
<i>Thomas N. Kakuda and Frank L. Tomaka</i>	
209. Probiotics	1366
<i>Varsha Gupta and Ritu Garg</i>	
210. Hypersensitivity to antibiotics	1371
<i>D’Jahna Akinyemi, Gulfem E. Celik, and N. Franklin Adkinson, Jr.</i>	
211. Antimicrobial agent tables	1383
<i>Jomy George and Rosalie Pepe</i>	
Index	1415
† Deceased	

Contributors

Fredrick M. Abrahamian, DO, FACEP, FIDSA
Clinical Professor of Medicine, David Geffen
School of Medicine at UCLA,
Los Angeles, California
Director of Education, Department of Emergency
Medicine, Olive View-UCLA Medical Center,
Sylmar, California

David W. K. Acheson, MD
Founder and CEO, The Acheson Group

Elisabeth E. Adderson, MD
Associate Member of St. Jude Faculty, Director of
Pediatric Infectious Diseases Fellowship
Program, Department of Infectious Diseases,
St. Jude Children’s Research Hospital,
Memphis, Tennessee
Department of Pediatrics, University of
Tennessee Health Science Center, Memphis,
Tennessee

Adaora A. Adimora, MD, MPH
Professor of Medicine
University of North Carolina at Chapel Hill,
Chapel Hill, North Carolina

N. Franklin Adkinson, Jr., MD
Professor of Medicine and Program Director,
Graduate Training Program in Clinical
Investigation
Associate TP Director, Allergy-Immunology
Johns Hopkins Asthma & Allergy Center,
Baltimore, Maryland

Payam Afshar, MS, MD
Gastroenterology Staff
Kaiser Permanente, San Diego/San Marcos,
California

D’Jahna Akinyemi, MD
Instructor of Medicine, Division of Allergy and
Clinical Immunology
Johns Hopkins Asthma and Allergy Center,
Johns Hopkins University, Baltimore,
Maryland

Timothy Aksamit, MD
Consultant, Pulmonary Disease and Critical Care
Medicine
Mayo Clinic, Rochester, Minnesota

Daniel M. Albert, MD, MS, FACS
Founding Director of UW McPherson Eye
Research Institute, F.A. Davis Professor in
Department of Ophthalmology and Visual
Sciences, Professor in Department of Pathology
University of Wisconsin School of Medicine and
Public Health, Madison, Wisconsin

Zainab Alhamal
Postdoctoral Fellow
MD Anderson Cancer Center, Houston, Texas

Mir Akbar Ali, MD, MS
Infectious Diseases Fellow
Creighton University School of Medicine,
Omaha, Nebraska

Donald Armstrong
Member and Chief of the Infectious Disease
Service Emeritus
Memorial Sloan-Kettering Cancer Center, New
York, New York

Andrew W. Artenstein, MD, FACP, FIDSA
Chair, Department of Medicine, Director,
Center for Biodefense and Emerging Pathogens,
Baystate Health, Springfield, Massachusetts
Tufts University School of Medicine Chair of
Medicine at Baystate
Professor of Medicine, Tufts University School
of Medicine, Boston, Massachusetts

Stephen Ash, MB, BS, FRCP
Consultant Physician
Ealing Hospital, London, UK

Aristides P. Assimakopoulos, MD, FIDSA
Physician
Metro Infectious Disease Consultants, LLC,
Chicago, Illinois

Amir A. Azari, MD

Fellow in Ophthalmic Pathology, Department of
Ophthalmology and Visual Sciences
University of Wisconsin, Madison, Wisconsin

Alfred E. Bacon III, MD, FACP

Medical Director, Clinical Trials, Clinical
Assistant Professor
Christiana Care Health System, Jefferson Medical
College, Newark, Delaware

Rajinder P. S. Bajwa, MD

Infectious Disease Consultant
Niagara Falls Memorial Medical Center, Niagara
Falls, New York

Johan S. Bakken, MD, PhD, FIDSA

Infectious Disease Associates, St. Luke's Hospital,
Duluth, Minnesota

Robert S. Baltimore, MD

Professor of Pediatrics and Epidemiology
Yale School of Medicine, New Haven, Connecticut

David B. Banach, MD, MS, MPH

Assistant Professor of Medicine, Infectious Diseases
Yale University School of Medicine, New Haven,
Connecticut

Amy S. Baranoski, MD, MSc

Assistant Professor, Department of Medicine,
Division of Infectious Diseases and HIV
Medicine
Drexel University College of Medicine,
Philadelphia, Pennsylvania

Jodie A. Barkin, MD

Internal Medicine Resident
University of Miami, Miller School of Medicine/
Jackson Memorial Hospital, Miami Beach,
Florida

**Jamie S. Barkin, MD, MACG, MACP, AGAF,
FASGE**

Division of Gastroenterology
Mt. Sinai Medical Center, Miami Beach, Florida

John G. Bartlett, MD

Chief, Division of Infectious Diseases
Johns Hopkins School of Medicine, Baltimore,
Maryland

Jules Baum, MD

Massachusetts Eye and Ear Infirmary, Harvard
Medical School, Boston, Massachusetts

Stephen G. Baum, MD

Professor, Department of Microbiology and
Immunology
Albert Einstein College of Medicine, Bronx,
New York

Daniel G. Bausch, MD, MPH&TM

Associate Professor, Department of Tropical
Medicine
Tulane School of Public Health and Tropical
Medicine, New Orleans, Louisiana

Gonzalo Bearman, MD, MPH, FACP

Associate Professor of Medicine, Epidemiology
and Community Medicine, Associate Hospital
Epidemiologist
Virginia Commonwealth University, Richmond,
Virginia

Susan E. Beekmann, RN, MPH

Carver College of Medicine, University of Iowa,
Iowa City, Iowa

Irmgard Behlau, MD

Instructor, Infectious Diseases
Mount Auburn Hospital, Harvard Medical
School, Cambridge, Massachusetts

**Nicholas J. Bennett, MA (Cantab),
MBBChir, PhD**

Assistant Professor of Pediatrics, Division of
Pediatric Infectious Diseases and Immunology
Connecticut Children's Medical Center, Hartford,
Connecticut

Joseph R. Berger, MD

Ruth L. Works Professor of Neurology
University of Kentucky Medical Center,
Lexington, Kentucky

Karen Beydoun, MD

Infectious Disease Fellow
Virginia Commonwealth University, Richmond,
Virginia

Kalyan Ram Bhamidimarri, MD, MPH

Assistant Professor of Medicine
University of Miami Miller School of Medicine,
Miami, Florida

Lori A. Blauwet, MD, MA

Associate Professor of Medicine, Department of
Medicine, Division of Cardiovascular Diseases
and Internal Medicine
Mayo Clinic, Rochester, Minnesota

Ioannis A. Bliziotis, MD, MSc
Alfa Institute of Biomedical Sciences (AIBS),
Athens, Greece

Charles D. Bluestone, MD
Professor of Otolaryngology
University of Pittsburgh School of Medicine,
Pittsburgh, Pennsylvania

Joseph A. Bocchini, Jr., MD
Professor and Chairman of Pediatrics, Pediatric
Infectious Diseases Section, Department of
Pediatrics
Director, Clinical Virology Laboratory, Louisiana
State University, Shreveport, Louisiana

Andrea K. Boggild, MSc, MD, FRCPC
Assistant Professor, Department of Medicine,
University of Toronto, Toronto, Canada
Clinical Director, Tropical Disease Unit,
University Health Network, Toronto, Canada
Parasitology Lead, Public Health Ontario
Laboratories, Public Health Ontario,
Toronto, Canada

Charlotte E. Bolton, MD
Clinical Associate Professor in Respiratory
Medicine, Honorary Consultant in Faculty of
Medicine and Health Sciences
University of Nottingham, Nottingham, UK

Fouad Bouharb, MD
Infectious Disease Attending, New York
Community Hospital, Brooklyn, New York;
St. John’s Episcopal Hospital, Far Rockaway,
Queens, New York

Suzanne F. Bradley, MD
Professor of Internal Medicine, University of
Michigan Medical School, Ann Arbor,
Michigan
Division of Infectious Diseases, Veterans Affairs
Ann Arbor Healthcare System, Ann Arbor,
Michigan

Roy D. Brod, MD
Senior Partner, Lancaster Retina Specialists
Clinical Associate Professor of Ophthalmology,
Pennsylvania State University School of
Medicine, Hershey, Pennsylvania

Itzhak Brook, MD, MSc
Professor, Pediatrics
Georgetown University School of Medicine,
Washington DC

Arthur E. Brown, MD, MACP, FIDSA, FSHEA
Chief and Medical Director, Employee Health &
Wellness Services
Attending Physician, Infectious Disease Service,
Memorial Sloan Kettering Cancer Center
Professor of Clinical Medicine, Weill Cornell
Medical College, New York, New York

Steven C. Buckingham, MD
Associate Professor of Pediatrics
University of Tennessee Health Science Center,
Memphis, Tennessee

Joseph Adrian L. Buensalido, MD
Division of Infectious Diseases
Wayne State University School of Medicine,
Detroit, Michigan

Stefan Bughi, MD, FABD, MACM
Clinical Associate Professor of Medicine,
Keck School of Medicine, University of
Southern California, Los Angeles, California
Rancho Los Amigos National Rehabilitation
Center, Downey, California

Michael Cappello, MD
Professor of Pediatrics, Microbial Pathogenesis
and Public Health
Yale School of Medicine, New Haven, Connecticut

Jeanne Carey, MD
Chief of Infectious Diseases
Lutheran Medical Center, Brooklyn, New York

Christopher F. Carpenter, MD, FACP, FIDSA
Associate Professor of Medicine, Oakland
University William Beaumont School of
Medicine, Rochester, Michigan
Section Head, Infectious Diseases and
International Medicine, Beaumont Hospital,
Royal Oak, Michigan

Carlos Carrillo, MD, MSc
Instituto de Medicina Tropical Alexander von
Humboldt Universidad Peruana Cayetano
Heredia, Lima, Peru
Departamento de Enfermedades Transmisibles,
Hospital Nacional Cayetano Heredia, Lima,
Peru

Cheryll N. Cash, MD
Ochsner Health System, New Orleans, Louisiana

Eduardo Castro-Echeverry, MD
Scott & White Hospital, Temple, Texas

Gulfem E. Celik, MD

Professor of Medicine
Ankara University School of Medicine, Ankara,
Turkey

Tania F. Cestari, MD, PhD

Department of Dermatology, School
of Medicine
University of Rio Grande do Sul, Hospital de
Clinicas de Porto Alegre, Brazil

Anne-Marie Chaftari, MD

Assistant Professor, Department of Infectious
Diseases, Division of Internal Medicine
MD Anderson Cancer Center, Houston, Texas

Suttirak Chaiwongkarjohn, MD

Cedars-Sinai Multicampus Program, VA Greater
Los Angeles Health Care System, UCLA-Olive
View, Los Angeles, California

Joshua J. Chalkley, MD

Department of Neurology
University of Kentucky Medical Center,
Lexington, Kentucky

Antoinette Chateau, MD

Dermatologist, Head of Department
Pietermaritzburg, South Africa

Tempe K. Chen, MD

Assistant Clinical Professor of Pediatrics, School
of Medicine
University of California Irvine, California

Suyin Chi, MD

Infectious Disease, Internal Medicine
Franciscan Medical Specialists, Valparaiso,
Indiana

Vivian Chidi, MD

Fellow, Division of Gastroenterology, Hepatology,
and Nutrition, Department of Medicine
Vanderbilt University, Nashville, Tennessee

Lisa M. Chirch, MD

University of Connecticut Health Center,
Farmington, Connecticut

Olivier Chosidow, MD, PhD

Professor of Dermatology, Chairman, Department
of Dermatology
AP-HP, Hôpital Henri-Mondor, UPEC Université
Paris-Est Créteil, Val de Marne, INSERM,
Créteil, France

Iqra Choudary, MD

Internal Medicine Resident
Rochester General Hospital, Rochester, New York

Mashiul H. Chowdhury, MD

Chief of Infectious Diseases
Cancer Treatment Centers of America at Eastern
Regional Medical Center, Philadelphia,
Pennsylvania

Vivian H. Chu, MD

Duke University Medical Center, Durham, North
Carolina

L. W. Preston Church, MD

Associate Professor, Division of Infectious
Disease,
Medical University of South Carolina, Charleston,
South Carolina
Chief of Hospital Epidemiology, Chief of
Infectious Diseases, Ralph H. Johnson VA
Medical Center, Charleston, South Carolina

Ross M. Clark, MD

Resident Physician, Department of Surgery
University of New Mexico HSC, Albuquerque,
New Mexico

Clay J. Cockerell, MD

Clinical Professor, Department of Dermatology
University of Texas Southwestern Medical Center,
Dallas, Texas

Carlo Contoreggi, MD

Diagnostic Radiology
Johns Hopkins Bayview Medical Center,
Baltimore, Maryland

Roberto Baun Corales, DO, AAHIVS

Senior Director, HIV Medicine and Clinical
Research
Trillium Health, Rochester, New York

Kent Crossley, MD

Professor of Medicine
University of Minnesota Medical School and the
Minneapolis VA Healthcare System,
Minneapolis, Minnesota

Burke A. Cunha, MD, MACP

Chief, Infectious Disease Division, Winthrop-
University Hospital, Mineola, New York
Professor of Medicine, State University of
New York School of Medicine, Stony Brook,
New York

Cheston B. Cunha, MD
Assistant Professor of Medicine, Infectious Disease Division
Brown University Alpert School of Medicine, Rhode Island Hospital and Miriam Hospital, Providence, Rhode Island

John J. Cush, MD
Director of Clinical Rheumatology, Baylor Research Institute, Dallas, Texas
Professor of Medicine and Rheumatology, Baylor University Medical Center, Dallas, Texas

Sally J. Cutler, PhD
Reader in Medical Microbiology, School of Health, Sport and Bioscience
University of East London, London, UK

John S. Czachor, MD, FACP, FIDSA, FSHEA
Chief of Infectious Diseases, Professor and Vice Chair of Internal Medicine
Wright State University Boonshoft School of Medicine, Dayton, Ohio

Titus L. Daniels, MD, MPH, MMHC
Vice Chair for Clinical Affairs, Department of Medicine
Vanderbilt University School of Medicine, Nashville, Tennessee

Kathryn H. Dao, MD, FACP, FACR
Associate Director of Clinical Rheumatology
Baylor Research Institute, Dallas, Texas

Carly R. Davis, MD
Fellow, Division of Pediatric Infectious Diseases
University of Utah, Salt Lake City, Utah

Scott F. Davies, MD
Chief of Medicine
Hennepin County Medical Center, Minneapolis, Minnesota

E. Patchen Dellinger, MD
Professor of Surgery
University of Washington, Seattle, Washington

Louise M. Dembry, MD, MS, MBA
Professor of Medicine, Infectious Diseases and Epidemiology
Yale University School of Medicine, New Haven, Connecticut

Stan Deresinski, MD
Clinical Professor, Division of Infectious Diseases, Department of Medicine
Stanford School of Medicine, Stanford, California

Lisa L. Dever, MD
Professor of Medicine
Rutgers New Jersey Medical School, Newark, New Jersey

Gordon Dickinson, MD
Professor of Medicine, University of Miami Miller School of Medicine, Miami, Florida
Chair, Infectious Disease Section, Miami VA Medical Center, Miami, Florida

Kevin D. Dieckhaus
University of Connecticut Health Center, Farmington, Connecticut

Mark J. DiNubile, MD
Merck Research Laboratories, North Wales, Pennsylvania

Ncoza C. Dlova, MBChB, FcDerm (SA)
KwaZulu-Natal University, Durban, South Africa

J. Stephen Dumler, MD
Professor, Departments of Pathology and Microbiology & Immunology
University of Maryland School of Medicine, Baltimore, Maryland

Herbert L. DuPont, MD, MACP
Director, Center for Infectious Diseases, Houston School of Public Health, University of Texas, Houston, Texas
Chief, Internal Medicine Service, St Luke's Hospital, Houston, Texas
Vice Chairman, Department of Medicine, Baylor College of Medicine, Houston, Texas

Marlene L. Durand, MD
Associate Professor, Harvard Medical School
Director, Infectious Disease Service, Massachusetts Eye and Ear Infirmary
Physician, Massachusetts General Hospital, Boston, Massachusetts

Asim K. Dutt, MD
Chief, Medical Service (retired), Alvin C. York Veterans Administration Medical Center, Murfreesboro, Tennessee
Professor and Vice Chairman (retired),

Cambridge University Press
 978-1-107-03891-2 - Clinical Infectious Disease
 Edited by David Schlossberg
 Frontmatter
[More information](#)

Department of Medicine, Melharrey Medical
 College, Nashville, Tennessee

Rima I. El-Herte, MD

Division of Infectious Diseases, Department of
 Internal Medicine
 University of Iowa Carver College of Medicine,
 Iowa City, Iowa

N. Cary Engleberg, MD, DTM&H

Professor of Internal Medicine and Microbiology
 & Immunology
 University of Michigan Medical School, Ann
 Arbor, Michigan

Lawrence J. Eron, MD, FACP, FIDSA

Associate Professor of Medicine, John A. Burns
 School of Medicine, University of Hawaii,
 Honolulu, Hawaii
 Consultant in Infectious Diseases,
 Kaiser Moanalua Medical Center, Honolulu,
 Hawaii

Janine Evans, MD

Associate Professor of Medicine, Section of
 Rheumatology, Department of Internal
 Medicine
 Yale University School of Medicine, New Haven,
 Connecticut

Jessica K. Fairley, MD

Assistant Professor of Medicine
 Emory University School of Medicine, Atlanta,
 Georgia

Matthew E. Falagas, MD, MSc, DSc

Alfa Institute of Biomedical Sciences (AIBS),
 Athens, Greece
 Department of Medicine, Tufts University
 School of Medicine, Boston, Massachusetts

Sebastian Faro, MS, PhD, MD, FACOG

John T. Armstrong Professor and Vice
 Chairman, Department of Obstetrics,
 Gynecology and Reproductive Sciences,
 University of Texas Health Science Center,
 Houston, Texas
 Chief of Obstetrics and Gynecology, Lyndon
 Banes Johnson Hospital, Houston, Texas

Thomas Fekete, MD

Section Chief, Infectious Diseases
 Professor, Department of Medicine
 Associate Professor, Department of Microbiology
 and Immunology

Executive Vice Chair for Clinical Affairs,
 Department of Medicine
 Temple University School of Medicine,
 Philadelphia, Pennsylvania

Thomas M. File Jr., MD, MSc

Chair, Infectious Disease Division, Summa Health
 System, Akron, Ohio
 Professor of Internal Medicine, Infectious Disease
 Division, Northeast Ohio Medical University,
 Rootstown, Ohio

Sydney M. Finegold, MD

Staff Physician, Infectious Diseases Section, VA
 Medical Center, Los Angeles, California
 Emeritus Professor, Department of Medicine
 Emeritus Professor, Department of
 Microbiology, Immunology and Molecular
 Genetics
 UCLA School of Medicine, Los Angeles,
 California

Mark Flasar, MD, MS

Assistant Professor of Medicine, Division of
 Gastroenterology and Hepatology
 University of Maryland School of Medicine,
 Baltimore, Maryland

Thomas A. Fleisher, MD

Chief, Department of Laboratory Medicine
 Chief, Immunology Service
 National Institutes of Health, Bethesda, Maryland

Harry W. Flynn Jr., MD

Professor of Ophthalmology, The J. Donald
 M. Gass Distinguished Chair of
 Ophthalmology, University of Miami Miller
 School of Medicine, Miami, Florida
 Bascom Palmer Eye Institute, Miami, Florida

Patricia M. Flynn, MD

Department of Infectious Diseases
 St. Jude Children's Research Hospital, Memphis,
 Tennessee

Derek Forster, MD

Assistant Professor of Medicine, Division of
 Infectious Diseases
 University of Kentucky, Lexington, Kentucky

**Michelle E. Freshman, MPH, MSN,
 APRN, FNP-BC**

Nurse Practitioner, Clinical Coordinator,
 Department of Medicine
 Newton-Wellesley Hospital, Newton, Massachusetts

Gerald Friedland, MD Professor of Medicine and Epidemiology Yale School of Medicine, New Haven, Connecticut	Professor of Clinical Medicine Mercy Medical Center, Rockville Center, New York
Harvey M. Friedman, MD Professor of Medicine and Infectious Diseases, Director of Botswana-UPenn Partnership Perelman School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania	Richard A. Gleckman, MD (deceased) Formerly Clinical Professor of Medicine Mount Sinai Hospital, New York, New York
Lawrence S. Friedman, MD Professor of Medicine, Harvard Medical School, Boston, Massachusetts Professor of Medicine, Tufts University School of Medicine, Boston, Massachusetts The Anton R. Fried, MD, Chair, Department of Medicine, Newton-Wellesley Hospital, Newton, Massachusetts Assistant Chief of Medicine, Massachusetts General Hospital, Boston, Massachusetts	Marshall J. Glesby, MD, PhD Professor of Medicine and Public Health Weill Cornell Medical College, New York, New York
Patrick G. Gallagher, MD Professor of Pediatrics, Pathology and Genetics Yale University School of Medicine, New Haven, Connecticut	Roderick Go, MD Department of Internal Medicine SUNY School of Medicine at Stony Brook, Stony Brook, New York
Ritu Garg, MBBS, MD Assistant Professor Government Medical College and Hospital, Chandigarh, India	Matthew Bidwell Goetz, MD Professor of Clinical Medicine, David Geffen School of Medicine at UCLA, Los Angeles, California Chief, Infectious Diseases, VA Greater Los Angeles Healthcare System, Los Angeles, California
Gloria von Geldern, MD Fellow in Neuroimmunology and Neurological Infections NINDS, NIH, Bethesda, Maryland	Mitchell Goldman, MD Professor of Medicine, Division of Infectious Diseases Indiana University School of Medical School, Indianapolis, Indiana
Jomy George, PharmD Clinical Pharmacist, Infectious Diseases Cooper Medical School of Rowan University, Camden, New Jersey	Ellie J. C. Goldstein, MD, FIDSA Clinical Professor of Medicine, David Geffen School of Medicine at UCLA, Los Angeles, California Director, R M Alden Research Laboratory, Santa Monica, California
Nicholas Gilpin, DO Section Head, Infectious Disease William Beaumont Hospital, Grosse Pointe, Michigan	Eduardo Gotuzzo, MD Director, Instituto de Medicina Tropical 'Alexander von Humboldt' Universidad Peruana Cayetano Heredia
Shelley A. Gilroy, MD, FACP Associate Professor of Medicine, Specialist in Infectious Diseases and HIV Medicine Albany Medical College, Albany, New York	Christopher J. Graber, MD, MPH Associate Clinical Professor of Medicine VA Greater Los Angeles Healthcare System, David Geffen School of Medicine at UCLA, Los Angeles, California
Aaron E. Glatt, MD, FACP, FIDSA, FSHEA Executive Vice President/Chief Administrative Officer	Jeremy D. Gradon, MD Associate Professor of Medicine The Johns Hopkins University School of Medicine, Baltimore, Maryland

Cambridge University Press
 978-1-107-03891-2 - Clinical Infectious Disease
 Edited by David Schlossberg
 Frontmatter
[More information](#)

David Y. Graham, MD

Departments of Medicine, Michael E. DeBakey
 Veterans Affairs Medical Center and Baylor
 College of Medicine, Houston, Texas
 Department of Bacteriology II, National
 Institute of Infectious Diseases, Tokyo, Japan

Jennifer Rubin Grandis, MD, FACS

Vice Chair for Research, Professor of
 Otolaryngology and Pharmacology,
 University of Pittsburgh School of Medicine,
 Pittsburgh, Pennsylvania
 Program Leader, Head and Neck Cancer Program,
 University of Pittsburgh Cancer Institute,
 Pittsburgh, Pennsylvania

Jane M. Grant-Kels, MD

University of Connecticut Health Center,
 Farmington, Connecticut

Ruth M. Greenblatt, MD

Professor of Clinical Pharmacy, Medicine,
 Epidemiology and Biostatistics
 University of California, San Francisco,
 California

Ronald A. Greenfield, MD (deceased)

Professor, Department of Medicine, Infectious
 Diseases
 University of Oklahoma Health Sciences Center,
 Oklahoma City, Oklahoma

David W. Gregory, MD

Associate Professor of Medicine, Emeritus,
 Division of Infectious Diseases
 Vanderbilt University School of Medicine,
 Nashville, Tennessee

David E. Griffith, MD

Professor of Medicine
 University of Texas Health Center, Tyler, Texas

Varsha Gupta, MBBS, MD, DNB

Professor
 Government Medical College and Hospital,
 Chandigarh, India

Lisa Haglund, MD

Associate Professor of Medicine, Division of
 Infectious Disease
 University of Cincinnati College of Medicine,
 Cincinnati, Ohio

Keith W. Hamilton, MD

Department of Infectious Diseases

Hospital of the University of Pennsylvania,
 Philadelphia, Pennsylvania

Margaret R. Hammerschlag, MD

Professor of Pediatrics and Medicine, Director of
 Division of Pediatric Infectious Diseases
 SUNY Downstate Medical Center, Brooklyn,
 New York

W. Lee Hand, MD, FIDSA

Retired: Professor of Internal Medicine (With
 Tenure), Texas Tech University Health Sciences
 Center, El Paso, Texas
 Infectious Diseases Consultant, Texas
 Department of Aging and Disability Services,
 El Paso, Texas

Shahbaz Hasan, MBBS

Staff Physician, Infectious Diseases
 THR-Presbyterian Hospital, Dallas, Texas

Rodrigo Hasbun, MD, MPH

Associate Professor in Infectious Diseases,
 Department of Internal Medicine
 University of Texas Medical School, Houston,
 Texas

Bridget Hathaway, MD

Assistant Professor, Department of Otolaryngology
 University of Pittsburgh Medical Center,
 Monroeville, Pennsylvania

Arash Heidari, MD

Assistant Clinical Professor of Medicine, David
 Geffen School of Medicine at UCLA
 Associate Program Director, Kern Medical Center,
 Los Angeles, California

David K. Henderson, MD

Deputy Director for Clinical Care, Associate
 Director for Hospital Epidemiology and Quality
 Improvement
 National Institutes of Health, Bethesda, Maryland

Ramin Sedaghat Herati, MD

Division of Infectious Disease
 University of Pennsylvania, Philadelphia,
 Pennsylvania

H. Franklin Herlong, MD

Professor, Department of Gastroenterology,
 Hepatology and Nutrition, Division of Internal
 Medicine
 University of Texas MD Anderson Cancer Center,
 Houston, Texas

Scott K. Heysell, MD, MPH
Assistant Professor, Division of Infectious
Diseases and International Health, Department
of Medicine
University of Virginia Health System,
Charlottesville, Virginia

Mark Hobbs, MBChB
Clinical Medical Education Fellow
University of Auckland, Auckland, New Zealand

Lisa S. Hodges, MD
Assistant Professor of Pediatrics and Medicine
Louisiana State University, Shreveport, Louisiana

Paul D. Holtom, MD
Professor of Medicine and Orthopaedics
Keck School of Medicine, University of Southern
California, Los Angeles, California

Thomas R. Howdieshell, MD, FACS, FCCP
Professor of Surgery, Trauma/Surgical Critical
Care, Department of Surgery
University of New Mexico HSC, Albuquerque,
New Mexico

Robert Huang, MD, DTM&H
Division of Infectious Diseases
Southern California Permanente Medical Group,
San Diego, California

Nguyen Thanh Hung, MD, PhD
Vice Director
Children’s Hospital 1, Ho Chi Minh City, Vietnam

Christopher D. Huston, MD
Associate Professor, Departments of Medicine,
Microbiology and Molecular Genetics
University of Vermont College of Medicine,
Burlington, Vermont

Michelle J. Iandiorio, MD
Associate Professor, Department of Internal
Medicine
University of New Mexico, Albuquerque,
New Mexico

David N. Irani, MD
Associate Professor of Neurology
University of Michigan Medical School,
Ann Arbor, Michigan

Raúl E. Istúriz, MD, FACP
Global Lead, Adult Medicines Development
Group & Scientific Affairs, Pfizer, Inc.

Jeffrey M. Jacobson, MD
Professor of Medicine, Microbiology and
Immunology
Chief, Division of Infectious Diseases and HIV
Medicine
Drexel University College of Medicine,
Philadelphia, Pennsylvania

William R. Jarvis, MD
President
Jason and Jarvis Associates, LLC, Hilton Head
Island, South Carolina

Selma M. B. Jeronimo, MD, PhD
Professor of Biochemistry, Director of Institute of
Tropical Medicine
Universidade Federal do Rio Grande do Norte,
Natal, Brazil

Caroline C. Johnson, MD
Philadelphia Department of Public Health,
Philadelphia, Pennsylvania

Jonas T. Johnson, MD
Professor and Chairman, Department of
Otolaryngology
The Dr Eugene N. Meyers Professor and
Chairman of Otolaryngology
Professor, Department of Oral and Maxillofacial
Surgery, School of Dental Medicine
University of Pittsburgh, Pittsburgh, Pennsylvania

Richard T. Johnson, MD
Distinguished Service Professor of Neurology,
Microbiology and Neuroscience
The Johns Hopkins University School of Medicine
and Bloomberg School of Public Health,
Baltimore, Maryland

Royce H. Johnson, MD, FACP
Professor of Medicine, David Geffen School of
Medicine at UCLA
Chief, Infectious Disease, Kern Medical Center,
Los Angeles, California

Ronald N. Jones, MD
Professor of Medicine, Tufts University
School of Medicine, Boston, Massachusetts
President, JMI Laboratories, North Liberty,
Iowa

Elaine C. Jong, MD, FIDSA
Department of Medicine
University of Washington School of Medicine,
Seattle, Washington

Cambridge University Press
 978-1-107-03891-2 - Clinical Infectious Disease
 Edited by David Schlossberg
 Frontmatter
[More information](#)

Mary Jordan, MD, CCRP
 MD Cancer Center Houston, Texas

Jonathan J. Juliano, MD
 Clinical Assistant Professor of Medicine, School of
 Medicine
 University of North Carolina, Chapel Hill,
 North Carolina

Thomas N. Kakuda, PharmD
 Scientific Director, Clinical Pharmacology
 (Quantitative Sciences), Infectious Diseases
 and Vaccines
 Janssen Pharmaceuticals, Titusville, New Jersey

Lili G. Kaplan, MD
 Ophthalmologist and Retina Specialist
 Retina Associates of Cleveland, Beachwood, Ohio

Ravi Karra, MD, MHS
 Medical Instructor, Division of Cardiology
 Duke University Medical Center, Durham,
 North Carolina

Keith S. Kaye, MD
 Professor of Medicine
 Wayne State University and Detroit Medical
 Center, Detroit, Michigan

Paul Kelly, MA, MD, FRCP
 Professor of Tropical Gastroenterology
 Barts and the London School of Medicine,
 Queen Mary University of London,
 Blizard Institute, London, UK

Louis E. Kennedy, REHS, BS
 Clinical Research Assistant
 Ealing Hospital NHS Trust, Southall, UK

Jay S. Keystone, MD, MSc (CTM), FRCPC
 Tropical Disease Unit, Division of Infectious
 Disease, Toronto General Hospital, UHN,
 Toronto, Canada
 Professor of Medicine, University of Toronto,
 Toronto, Canada

Stephen A. Klotz, MD
 Professor of Medicine, Division Chief, Infectious
 Diseases
 University of Arizona, Tucson, Arizona

Lisa M. Kodadek, MD
 Resident, Department of Surgery
 Johns Hopkins University School of Medicine

Evelyn K. Koestenblatt, MS
 Department of Ophthalmology
 Montefiore Medical Center, Bronx,
 New York

James R. Korndorffer Jr, MD, MHPE, FACS
 Professor, Department of Surgery
 Tulane University School of Medicine,
 New Orleans, Louisiana

Peter J. Krause, MD
 Senior Research Scientist
 Yale School of Public Health, Yale School of
 Medicine

Ilona Kronig
 Division of Infectious Diseases, Department of
 Specialties of Internal Medicine
 Geneva University Hospitals and Faculty of
 Medicine, Geneva, Switzerland

Amol D. Kulkarni
 University of Wisconsin Department of
 Ophthalmology and Visual Sciences, Madison,
 Wisconsin

David T. Kuhar
 Adjunct Assistant Professor, Infectious
 Diseases
 Emory University School of Medicine, Atlanta,
 Georgia

Sampath Kumar, MD
 Infectious Diseases Attending
 Metro Infectious Diseases, Chicago,
 Illinois
 University of Illinois, Chicago, Illinois

Alvaro Lapitz, MD
 Assistant Professor of Clinical Medicine,
 Division of Internal Medicine
 and Geriatrics
 Indiana University School of Medical School,
 Indianapolis, Indiana

Chuen-Yen Lau, MD, MS, MPH
 National Institutes of Health, Bethesda,
 Maryland

William J. Ledger, MD
 The Given Foundation Professor Emeritus of
 Obstetrics and Gynecology
 Weill Cornell Medical College, New York,
 New York

Thomas Lee

Matthew E. Levison, MD
Adjunct Professor of Medicine, Professor of Public Health
Drexel University, Bryn Mawr, Pennsylvania

Stuart M. Levitz, MD
Professor, Department of Medicine
University of Massachusetts Medical School,
Worcester, Massachusetts

Daniel Lew, MD
Division of Infectious Diseases, Department of
Specialties of Internal Medicine
Geneva University Hospitals and Faculty of
Medicine, Geneva, Switzerland

Neil S. Lipman, VMD
Director, Center of Comparative Medicine and
Pathology
Professor of Veterinary Medicine in Pathology
and Laboratory Medicine
Memorial Sloan-Kettering Cancer Center and the
Weill Medical College of Cornell University,
New York, New York

Pamela A. Lipsett, MD, MHPE
Warfield M. Firor Endowed Professorship in
Surgery, Professor of Surgery, Anesthesiology
and Critical Care Medicine
Johns Hopkins University School of Medicine,
Baltimore, Maryland

Ann-Marie Lobo, MD
Assistant Professor of Ophthalmology, Ocular
Immunology and Uveitis Specialist
Massachusetts Eye and Ear Infirmary,
Harvard Medical School, Boston,
Massachusetts

Sarah S. Long, MD
Professor of Pediatrics, Drexel University
College of Medicine, Philadelphia,
Pennsylvania
Chief, Section of Infectious Diseases,
St. Christopher’s Hospital for Children,
Philadelphia, Pennsylvania

Bennett Lorber, MD, MACP
Thomas M. Durant Professor of Medicine,
Professor of Microbiology and Immunology
Temple University School of Medicine,
Philadelphia, Pennsylvania

Alice Lorch, MD
Resident in Ophthalmology
Massachusetts Eye and Ear Infirmary, Harvard
Medical School, Boston, Massachusetts

Benjamin J. Luft, MD
Professor, Department of Internal Medicine
Stony Brook University Hospital, Stony Brook,
New York

Larry I. Lutwick, MD, FACP
Professor, Medicine and Biomedical Sciences
Western Michigan University Homer
Stryker MD School of Medicine, Kalamazoo,
Michigan

John Maa, MD
Department of Surgery
University of California, San Francisco,
California

Rodger D. MacArthur, MD
Director and Principal Investigator
Newland Immunology Center of Excellence,
Southfield, Michigan

Karl Madaras-Kelly, PharmD, MPH
Professor, Department of Pharmacy Practice and
Administrative Sciences
Idaho State University College of Pharmacy,
Meridian, Idaho

Joanne T. Maffei, MD
Associate Professor
Louisiana State University Health Sciences
Center, New Orleans, Louisiana

Rafael Gerardo Magaña, MD
NYC Plastic Surgery, New York, New York

James H. Maguire, MD, MPH
Professor of Medicine, Harvard Medical School,
Boston, Massachusetts
Division of Infectious Disease, Brigham and
Women’s Hospital, Boston, Massachusetts

Francis S. Mah, MD
Ophthalmologist
Scripps Health, San Diego, California

Anita Mahadevan, MD
Associate Professor, Neuropathology
National Institute of Mental Health &
Neurosciences, Bangalore, India

Mark A. Malangoni, MD
Associate Executive Director,
American Board of Surgery, Philadelphia,
Pennsylvania

Choukri Ben Mamoun, PhD
Associate Professor of Medicine
Yale School of Medicine, New Haven,
Connecticut

Suzaan Marais, MBChB, FC NeuroI(SA), PhD
Senior Research Officer, Clinical Infectious
Diseases Research Initiative, Institute of
Infectious Disease and Molecular Medicine
(IIDMM), University of Cape Town, Cape
Town, South Africa
Department of Medicine, University of Cape
Town, Cape Town, South Africa

Peter Mariuz, MD
Professor of Medicine
University of Rochester, Strong Memorial
Hospital, Rochester, New York

Thomas J. Marrie MD, FRCPC
Dean, Faculty of Medicine
Dalhousie University, Clinical Research Centre,
Halifax, Canada

Paul Martin, MD, FRCP, FRCPI
Professor of Medicine
Chief, Division of Hepatology
University of Miami Miller School of Medicine,
Miami, Florida

Richard A. Martinello, MD
Associate Professor of Internal Medicine and
Pediatrics, Yale School of Medicine, New
Haven, Connecticut
Office of Public Health, Department of Veterans
Affairs, Washington DC

Amy J. Mathers, MD
Assistant Professor, Division of Infectious
Diseases and International Health
University of Virginia Health System,
Charlottesville, Virginia

J. Anthony Mebane, MD
Division of Infectious Diseases
VA Medical Center, Boise, Idaho

Jay B. Mehta, MD, FCCP
Professor of Medicine, Chief of Division of
Preventive Medicine and Epidemiology

East Tennessee State University, James
H. Quillen College of Medicine, Johnson City,
Tennessee

Jeffery L. Meier, MD
Associate Professor, Internal Medicine
University of Iowa, Iowa City, Iowa

**Graeme Meintjes, MBChB, FRCP(Glasg),
FCP(SA), DipHIVMan(SA), PhD, MPH**
Associate Professor, Institute of Infectious
Disease and Molecular Medicine, University
of Cape Town, Cape Town, South Africa

Gregory J. Mertz, MD
Professor of Internal Medicine
University of New Mexico, Albuquerque,
New Mexico

Burt R. Meyers, MD, FACP
Adjunct Professor of Medicine
New York Medical College, Valhalla, New York

Amanda M. Michael, DO
Fellow of Infectious Diseases and HIV Medicine
Drexel University College of Medicine,
Philadelphia, Pennsylvania

Christopher T. Miller, MD
Infectious Diseases Fellow, Division of Infectious
Diseases, Department of Internal Medicine
Jefferson Medical College of Thomas Jefferson
University, Philadelphia, Pennsylvania

Laurence F. Mirels, MD
Physician, Division of Infectious Disease
Santa Clara Valley Medical Center, Santa Clara,
California

Amirkaveh Mojtahed, MD
Resident Physician, Internal Medicine
Board Certified Anatomic Pathologist
Scripps Green Hospital, La Jolla, California

Gentiane Monsel, MD
Consultant, Department of Internal Medicine,
Centre Hospitalier intercommunal de Crèteil,
Crèteil, France
Department of Dermatology, AP-HP, Hôpital
Henri-Mondor, Crèteil, France

Thomas A. Moore, MD, FACP
Clinical Professor, Department of Medicine
University of Kansas School of Medicine, Wichita,
Kansas

Douglas R. Morgan, MD, MPH
Associate Professor of Medicine
Division of Gastroenterology, Hepatology, and
Nutrition, Vanderbilt Ingram Cancer Center
(VICC)
Vanderbilt Institute for Global Health (VIGH)
Vanderbilt University, Nashville, Tennessee

Anisa Mosam, MD
Dermatologist
University of KwaZulu-Natal, Durban, South
Africa

Maurice A. Mufson, MD, MACP
Professor of Medicine Emeritus and Chairman
Emeritus, Department of Medicine
Marshall University Joan C. Edwards School of
Medicine, Huntington, West Virginia

Jorge Murillo, MD, FACP, FIDSA
Associate Professor of Medicine,
Herbert Wertheim College of Medicine,
Florida International University, Miami, Florida
Consultant in Infectious Disease and
Tropical Medicine, Baptist Health, Miami,
Florida

Robert L. Murphy, MD
Director, Center for Global Health
Northwestern University Feinberg School of
Medicine, Chicago, Illinois

Timothy F. Murphy, MD
Senior Associate Dean for Clinical and
Translational Research
University at Buffalo School of Medicine and
Biomedical Sciences, Buffalo, New York

Avindra Nath, MD
Chief, Section of Infections of the Nervous System
National Institute of Neurological Diseases and
Stroke, National Institutes of Health, Bethesda,
Maryland

Kari A. Neemann, MD
Assistant Professor, Pediatric Infectious Disease
University of Nebraska Medical Center, Omaha,
Nebraska

Ronald L. Nichols, MD, MS, FACS
William Henderson Professor of Surgery,
Emeritus Professor of Microbiology and
Immunology
Tulane University School of Medicine, New
Orleans, Louisiana

Lindsay E. Nicolle, MD, FRCPC
Professor, Department of Internal Medicine and
Medical Microbiology
University of Manitoba, Winnipeg, Canada

Nancy B. Norton, MD
Associate Professor, Department of Anatomy and
Pathology
Marshall University Joan C. Edwards
School of Medicine, Huntington,
West Virginia

Judith A. O'Donnell, MD
Hospital Epidemiologist, Director of Department
of Infectious Prevention and Control, Section
Chief of Infectious Diseases Division, Associate
Professor of Clinical Medicine
Penn Presbyterian Medical Center, Philadelphia,
Pennsylvania

John C. Oeltjen, MD, PhD
Associate Professor of Surgery
University of Miami, Miami, Florida

Anthony Ogedegbe, MD
Division of Hospital Medicine
Weill Cornell Medical College, New York,
New York

Todd D. Otteson, MD, MPH
Division Chief, Pediatric Otolaryngology,
University Hospitals Case Medical Center,
Cleveland, Ohio
Associate Professor, Otolaryngology and
Pediatrics, Case Western Reserve University
School of Medicine, Cleveland, Ohio

Michael N. Oxman, MD
Professor of Medicine and Pathology, University
of California, San Diego, California
Staff Physician, Infectious Diseases, VA San Diego
Healthcare System, San Diego, California

Robert L. Owen, MD
Department of Veteran Affairs Medical Center,
San Francisco, California

George A. Pankey, MD
Director, Infectious Disease Research
Ochsner Clinic Foundation, New Orleans,
Louisiana

George Pappas, MD
Institute for Continuing Medical Education of
Ioannina, Greece

Cambridge University Press
 978-1-107-03891-2 - Clinical Infectious Disease
 Edited by David Schlossberg
 Frontmatter
[More information](#)

Peter G. Pappas, MD, FACP

Professor of Medicine, Department of Medicine
 and Division of Infectious Diseases, Director of
 Mycoses Study Group
 University of Alabama at Birmingham,
 Birmingham, Alabama

Richard H. Parker, MD, FIDSA

Infectious Diseases and Internal Medicine,
 Supervisor of Primary Care and
 HIV Medicine
 Andromeda Transcultural Health Center,
 Washington DC

Thomas F. Patterson, MD

Professor and Chief, Infectious Diseases
 University of Texas Health Science Center at
 San Antonio and South Texas Veterans Health
 Care System, San Antonio, Texas

Andrew T. Pavia, MD

George and Esther Gross Presidential
 Professor
 Chief, Division of Pediatric Infectious
 Diseases
 University of Utah, Salt Lake City, Utah

**Zbigniew S. Pawlowski, MD, DTMH Dr honoris
 causa Warsaw**

Professor Emeritus, Clinic of Tropical and
 Parasitic Diseases
 University of Medicine, Poznan, Poland

Richard D. Pearson, MD

Harrison Distinguished Professor of Medicine
 and Pathology, Departments of Medicine and
 Pathology, Division of Infectious Diseases and
 International Health
 University of Virginia School of Medicine,
 Charlottesville, Virginia

Stephen I. Pelton, MD

Professor of Pediatrics and Epidemiology
 Boston University Schools of Medicine and Public
 Health, Boston, Massachusetts

Rosalie Pepe, MD

Assistant Professor of Medicine
 Cooper Medical School of Rowan University,
 Camden, New Jersey

Jeffrey M. Percak, MD

Assistant Professor of Clinical Medicine,
 Adult Infectious Diseases
 Tulane University, New Orleans, Louisiana

Simone Pessato, MD

Department of Dermatology, School of Medicine
 University of Rio Grande do Sul, Hospital de
 Clinicas de Porto Alegre, Brazil

K. Shad Pharaon, MD

Department of Surgery
 PeaceHealth Southwest Medical Center,
 Vancouver, Washington

Phillippa Poole, BSc, MBChB, MD, FRACP

Professor, Department of Medicine
 The University of Auckland, Auckland, New
 Zealand

William G. Powderly, MD

J. William Campbell Professor of Medicine
 Director, Institute for Public Health
 Co-Director, Division of Infectious Diseases
 Washington University, St. Louis, Missouri

Laurel C. Preheim, MD

Professor of Medicine, Medical Microbiology,
 and Immunology, Division of Adult Infectious
 Diseases
 Creighton University School of Medicine, Omaha,
 Nebraska

Anastácio de Queiroz Sousa, MD, PhD

Adjunct Professor of Medicine and Pathology
 Director, São José Hospital for Infectious Diseases
 Federal University of Ceará, Fortaleza, Ceará, Brazil

Thomas C. Quinn, MD

Professor of Medicine, Director of Johns Hopkins
 Center for Global Health
 The Johns Hopkins University School of
 Medicine, Baltimore, Maryland

Issam Raad, MD, FACP, FIDSA, FSHEA

Chair, Department of Infectious Diseases,
 Infection Control and Employee Health,
 Division of Internal Medicine
 University of Texas MD Anderson Cancer Center,
 Houston, Texas

Sanjay Ram, MD

Associate Professor, Department of Medicine
 University of Massachusetts Medical School,
 Worcester, Massachusetts

Carlos R. Ramírez-Ramírez, MD

Department of Medicine
 University of Puerto Rico School of Medicine,
 San Juan, Puerto Rico

Carlos H. Ramírez-Ronda, MD, MACP
Professor of Medicine
University of Puerto Rico School of Medicine,
San Juan, Puerto Rico

Jean-Pierre Raufman, MD
Professor of Medicine and Head, Division of
Gastroenterology and Hepatology
University of Maryland School of Medicine,
Baltimore, Maryland

Raymund R. Razonable, MD
Professor of Medicine; Chair, Transplantation
Virology and Infectious Diseases, Division of
Infectious Diseases
Mayo Clinic, Rochester, Minnesota

Paulina A. Rebolledo, MD, MSc
Infectious Diseases Fellow, Division
of Infectious Diseases, Department of
Medicine
Emory University School of Medicine, Atlanta,
Georgia

Sharon L. Reed, MD, MSCTM, D(ABMM)
Professor of Pathology and Medicine
University of California School of Medicine,
San Diego, California

Robert V. Rege, MD
Laparoscopic Surgeon
University of Texas Southwestern Medical Center,
Dallas, Texas

Michael F. Rein, MD
Professor Emeritus, Division of Infectious
Diseases and International Health
University of Virginia Health System,
Charlottesville, Virginia

Dalilah Restrepo, MD
St. Luke's – Roosevelt Hospital, New York,
New York

Bruce S. Ribner, MD, MPH
Professor of Medicine, Emory University School
of Medicine, Atlanta, Georgia
Epidemiologist, Emory University
Hospital and The Emory Clinic, Atlanta,
Georgia

Emiko Rimbara, PhD
Department of Bacteriology II
National Institute of Infectious Diseases, Tokyo,
Japan

Allan Ronald, OC, MD, FRCPC, MACP
Distinguished Professor Emeritus
University of Manitoba, Winnipeg, Canada

Virginia R. Roth, MD, FRCPC
Associate Professor of Medicine, University of Ottawa
Director, Infectious Prevention and Control
Program, The Ottawa Hospital, Ottawa, Canada

Nadine G. Rouphael, MD
Assistant Professor of Medicine, Division of
Infectious Diseases
Emory University School of Medicine, Atlanta, Georgia

Thomas A. Russo, MD
Professor and Chief, Infectious Disease,
Department of Medicine
University at Buffalo School of Medicine
and Biomedical Sciences, Buffalo, New York
Staff Physician, Veterans Administration, Western
New York Healthcare System

William A. Rutala, MS, MPH, PhD
Professor of Medicine, Director of Statewide
Program for Infection Control and Epidemiology,
Director of Hospital Epidemiology, Occupational
Health and Safety Program
University of North Carolina School of Medicine,
Chapel Hill, North Carolina

Eric Sachinwalla, MD
Clinical Instructor, Infectious Diseases
Temple University Hospital, Philadelphia,
Pennsylvania

Amar Safdar, MD
Associate Professor of Medicine, Director
Transplant Infectious Diseases
NYU Langone Medical Center, NYU School of
Medicine, New York, New York

Wilmara Salgado-Pabón, MS, PhD
Post-Doctoral Fellow
University of Iowa, Carver College of Medicine,
Iowa City, Iowa

Rafik Samuel, MD
Professor of Medicine
Temple University Hospital, Philadelphia,
Pennsylvania

Nuria Sanchez Clemente, MBChB, MSc, DTMH, MRCPCH
Paediatric Infectious Diseases
St. Mary's Hospital, London, UK

Sarbjit S. Sandhu, MD
Infectious Disease Fellow
Robert Wood Johnson University Hospital,
New Brunswick, New Jersey

Patrick M. Schlievert, PhD
Professor and Chair
University of Iowa, Iowa City, Iowa

Steven K. Schmitt, MD, FIDSA, FACP
Head, Section of Bone and Joint Infections
Associate Professor of Medicine, Department of
Infectious Disease
Vice Chair for Professional Staff Affairs, Medicine
Institute
Cleveland Clinic, Cleveland, Ohio

William A. Schwartzman, MD
Associate Clinical Professor of Medicine,
UCLA School of Medicine, Los Angeles,
California
Chief, Infectious Diseases, Sepulveda VA OPC,
Sepulveda, California
Chair, Infection Control Committee
Attending in Infectious Diseases, VA Greater
Los Angeles Healthcare System, Los Angeles,
California

Pritha Sen, MD
Department of Medicine, Division of Infectious
Disease
Harvard Medical School, Massachusetts General
Hospital, Boston, Massachusetts

Arlene C. Seña, MD, MPH
Associate Professor of Medicine, Division of
Infectious Diseases, University of North
Carolina at Chapel Hill, Chapel Hill, North
Carolina
Medical and Laboratory Director, Durham
County Department of Public Health, Durham,
North Carolina

John W. Sensakovic, MD, PhD
Infectious Disease
St. Michael's Medical Center, Newark, New Jersey

Susan K. Seo MD
Director, Antibiotic Management Program,
Associate Clinical Member, Infectious Disease
Service, Memorial Sloan-Kettering Cancer
Center, New York, New York
Associate Professor of Clinical Medicine,
Weill Medical College of Cornell University,
New York, New York

Dennis J. Shale, MD
Clinical Professor, Institute of Molecular and
Experimental Medicine
Cardiff University, Cardiff, UK

Susarla K. Shankar, MD
Emeritus Professor, Department of
Neuropathology
National Institute of Mental Health and
Neurosciences, Bangalore, India

Sylvia J. Shaw, MD
Assistant Professor of Clinical Medicine
Keck School of Medicine, University of Southern
California, Los Angeles, California

Sheela Sheno, MD, MPH
Assistant Professor of Medicine
Yale School of Medicine, New Haven, Connecticut

Kamaljit Singh MD, D(ABMM)
Associate Professor, Infectious Diseases
Rush University Medical Center, Chicago,
Illinois

Upinder Singh, MD
Associate Professor of Medicine (Infectious
Diseases and Geographic Medicine) and
Microbiology and Immunology
Stanford School of Medicine, Stanford, California

Linda A. Slavoski, MD
Doctor of Infectious Disease Medicine and
Internal Medicine
Wilkes Barre, Pennsylvania

James W. Smith, MD
Professor of Internal Medicine and Infectious
Diseases
University of Texas Southwestern Medical School,
Dallas, Texas

Leon G. Smith, MD
Chairman, Department of Medicine, St. Michael's
Medical Center, Newark, New Jersey
Chairman, Department of Medicine, Seton Hall
University School of Graduate Medical
Education
Professor of Preventative Medicine, New Jersey
Medical School, New Brunswick, New Jersey

Jessica N. Snowden, MD
Assistant Professor
University of Nebraska Medical Center, Omaha,
Nebraska

Jack D. Sobel, MD
Division of Infectious Diseases
Wayne State University School of Medicine,
Detroit, Michigan

Elizabeth Soda, MD
Infectious Diseases
Belmont, California

M. Rizwan Sohail, MD
Assistant Professor of Medicine, Divisions of
Infectious Diseases and Cardiovascular
Diseases, Department of Medicine
Mayo Clinic College of Medicine, Rochester,
Minnesota

Joseph S. Solomkin, MD
Professor Emeritus, Department of Surgery,
University of Cincinnati College of Medicine,
Cincinnati, Ohio
Director, Surgical Antimicrobial Stewardship
Program, University of Cincinnati Hospital,
Cincinnati, Ohio

Kathleen E. Squires, MD
Professor of Medicine, Division of Infectious
Diseases, Department of Internal
Medicine
Jefferson Medical College of Thomas Jefferson
University, Philadelphia, Pennsylvania

Barbara W. Stechenberg, MD
Professor of Pediatrics, Tufts University
School of Medicine, Springfield, Massachusetts
Associate Program Director, Pediatrics Residency
Program, Baystate Medical Center, Springfield,
Massachusetts

James M. Steckelberg, MD
Professor of Medicine, Division of Infectious
Diseases, Department of Medicine
Mayo Clinic College of Medicine, Rochester,
Minnesota

Roy T. Steigbigel, MD
Distinguished Service Professor, Medicine,
Pathology, Pharmacology and Microbiology
Stony Brook University, Stony Brook,
New York

James P. Steinberg, MD
Professor of Medicine, Division of Infectious
Diseases
Emory University School of Medicine, Atlanta,
Georgia

David S. Stephens, MD
Stephen W. Schwarzmans Distinguished Professor
of Medicine, Director, Division of Infectious
Diseases, Department of Medicine, Emory
University School of Medicine, Atlanta, Georgia
Medical Research Service, Department of
Veterans Affairs Medical Center (Atlanta),
Decatur, Georgia

Dennis L. Stevens, MD, PhD
Professor of Medicine
University of Washington School of Medicine,
Seattle, Washington
Chief, Infectious Disease, VAMC, Boise, Idaho

Kathryn N. Suh, MD, FRCPC
Associate Professor of Medicine, Division of
Infectious Diseases
University of Ottawa, Ottawa, Canada

Domizio Suvà
Division of Orthopaedic and Trauma Surgery,
Department of Surgery
Geneva University Hospitals and Faculty of
Medicine, Geneva, Switzerland

Babafemi O. Taiwo, MBBS
Associate Professor of Medicine, Division of
Infectious Diseases
Feinberg School of Medicine, Northwestern
University, Chicago, Illinois

Naasha J. Talati, MD
Division of Infectious Diseases, Department of
Medicine
Emory University School of Medicine, Atlanta,
Georgia

Giorgio Tarchini, MD
Associate Staff, Infectious Disease
Cleveland Clinic, Weston, Florida

Frank L. Tomaka, MD
Clinical Leader, STI Vaccines; Senior Director,
Clinical Development
Janssen Pharmaceuticals, Titusville, New Jersey

Kenneth J. Tomecki, MD
Department of Dermatology
Cleveland Clinic, Cleveland, Ohio

Donato Torre, MD
Consultant in Infectious Diseases, Section of
Infectious Diseases
General Hospital, Cittiglio (Varese), Italy

Cambridge University Press
 978-1-107-03891-2 - Clinical Infectious Disease
 Edited by David Schlossberg
 Frontmatter
[More information](#)

Marc Traeger, MD

Indian Health Service, White River, Arizona
 Clinical Assistant Professor, University of
 Arizona College of Medicine, Tucson, Arizona

Edmund C. Tramont, MD, FACP

Director, Division of AIDS
 National Institutes of Health, Bethesda, Maryland

Donald D. Trunkey, MD

Department of Surgery
 Oregon Health & Science University, Portland,
 Oregon

Elmer Y. Tu, MD

Associate Professor of Clinical Ophthalmology,
 Department of Ophthalmology and Visual
 Science
 University of Illinois Eye and Ear Infirmary,
 Chicago, Illinois

Allan R. Tunkel, MD, PhD, MACP

Professor of Medicine, Associate Dean for Medical
 Education
 Warren Alpert Medical School of Brown
 University, Providence, Rhode Island

Ilker Uçkay, MD

Division of Infectious Diseases, Department of
 Specialties of Internal Medicine
 Division of Orthopaedic and Trauma Surgery,
 Department of Surgery
 Geneva University Hospitals and Faculty of
 Medicine, Geneva, Switzerland

Travis Vandergriff, MD

Assistant Professor, Department of Dermatology
 University of Texas Southwestern Medical Center,
 Dallas, Texas

Pierre Vaudaux, PhD

Division of Infectious Diseases, Department of
 Specialties of Internal Medicine
 Geneva University Hospitals and Faculty of
 Medicine, Geneva, Switzerland

Karen J. Vigil, MD

Assistant Professor, Division of Infectious
 Diseases
 The University of Texas Health Science Center at
 Houston - Medical School, Houston, Texas

Alok Vij, MD

Chief Resident, Department of Dermatology
 Cleveland Clinic Foundation, Cleveland, Ohio

Gian L. Vinelli, BA

Medical Student
 New York Medical College, New York, New York

Duc J. Vugia, MD, MPH, FACP, FIDSA

Chief, Infectious Diseases Branch
 California Department of Public Health,
 Richmond, California

Jatin M. Vyas, MD, PhD

Assistant Professor in Medicine, Department of
 Medicine, Division of Infectious Disease
 Harvard Medical School, Massachusetts General
 Hospital, Boston, Massachusetts

Keyur S. Vyas, MD

Associate Professor of Medicine
 University of Arkansas for Medical Sciences,
 Little Rock, Arkansas

Ken B. Waites, MD, FAAM

Professor of Pathology and Microbiology,
 Director of Diagnostic Mycoplasma Laboratory,
 University of Alabama at Birmingham,
 Birmingham, Alabama
 Staff Pathologist and Microbiology Consultant,
 Birmingham Veterans Affairs Medical Center,
 Birmingham, Alabama

Richard R. Watkins, MD, MS, FACP

Associate Professor, Internal Medicine
 Northeast Ohio Medical University, Rootstown,
 Ohio
 Division of Infectious Diseases, Akron General
 Medical Center, Akron, Ohio

David J. Weber, MD, MPH

Professor of Medicine and Pediatrics, University
 of North Carolina School of Medicine, Chapel
 Hill, North Carolina
 Professor of Epidemiology, Gillings School of
 Global Public Health, Chapel Hill, North
 Carolina

Jeffrey M. Weinberg, MD

Department of Dermatology
 Columbia University College of Physicians and
 Surgeons, New York, New York

Debra L. Weiner, MD, PhD

Attending Physician, Emergency Medicine,
 Boston Children's Hospital, Boston,
 Massachusetts
 Assistant Professor, Pediatrics, Harvard Medical
 School, Boston, Massachusetts

Cambridge University Press
 978-1-107-03891-2 - Clinical Infectious Disease
 Edited by David Schlossberg
 Frontmatter
[More information](#)

Richard J. Whitley, MD
 Departments of Pediatrics, Medicine,
 Microbiology and Surgery
 University of Alabama at Birmingham School of
 Medicine, Birmingham, Alabama

Nathan P. Wiederhold, PharmD
 Associate Professor, Departments of Pathology
 and Medicine/Infectious Diseases; Director,
 Fungus Testing Laboratory
 University of Texas Health Science Center,
 San Antonio, Texas

**Mary Elizabeth Wilson, MD, FACP, FIDSA,
 FASTMH**
 Adjunct Professor, Global Health and Population
 Harvard School of Public Health, Boston,
 Massachusetts
 Visiting Professor of Epidemiology and
 Biostatistics, University of California, San
 Francisco, California

Brian Wispelwey, MD
 Professor of Medicine, Infectious Diseases and
 International Health
 University of Virginia School of Medicine,
 Charlottesville, Virginia

Patricia Wong, MD, MSCE
 Lankenau Hospital/Main Line Gastroenterology
 Associates, Philadelphia, Pennsylvania
 Adjunct Assistant Professor of Medicine,
 Johns Hopkins University, Baltimore,
 Maryland

Bian Wu, MD
 Resident
 UCSF School of Medicine, San Francisco,
 California

Henry M. Wu, MD, DTM&H
 Assistant Professor of Medicine
 Emory University School of Medicine, Atlanta,
 Georgia

Neal S. Young, MD
 Chief of Hematology Branch, Director of
 Trans-NIH Center for Human Immunology,
 Autoimmunity and Inflammation
 National Heart, Lung and Blood Institute,
 National Institutes of Health, Bethesda, Maryland

Roger W. Yurt, MD
 Chief of Burns, Critical Care and Trauma
 New York Presbyterian Hospital, New York,
 New York

John A. Zaia, MD
 Chair and Professor of Virology, Professor of
 Pediatrics, Aaron D. Miller and Edith Miller
 Chair in Gene Therapy
 City of Hope, Duarte, California

Tirdad T. Zangeneh, DO, MA
 Assistant Professor of Clinical Medicine
 University of Arizona, Tucson, Arizona

Jonathan M. Zenilman, MD
 Johns Hopkins Bayview Medical Center,
 Baltimore, Maryland

**Alimuddin Zumla MD, PhD, FRCP, FRCPath,
 FSBiol**
 Professor of Infectious Diseases and International
 Health, Department of Infection, Division of
 Infection and Immunity
 University College London and University
 College London Hospitals NHS Foundation
 Trust, London, UK

Cambridge University Press
978-1-107-03891-2 - Clinical Infectious Disease
Edited by David Schlossberg
Frontmatter
[More information](#)

Preface

The gratifying response to *Clinical Infectious Disease* has prompted this second edition. As with the first edition, our goal remains a complete and user-friendly guide to the diagnosis and treatment of infectious diseases.

The book is divided into 10 sections. First, Clinical syndromes, both general and by organ system, provides a traditional anatomic orientation, although within this section additional chapters are devoted to particularly challenging entities that are often difficult to research, such as infectious thyroiditis, deep neck infection, periorbital infection, lymphadenopathy, mediastinitis, pacemaker infection, sexually transmitted enteric infection, bursitis, polyarthritis, psoas abscess, splenic abscess, spinal epidural abscess, cerebrospinal shunt infection, myelitis and peripheral neuropathy, and prion disease.

The second section, The susceptible host, includes individual chapters on infection in various immunocompromised states, including diabetes, transplantation, neutropenia, dialysis, pregnancy, and asplenia. Subsequent entire sections are devoted to HIV, nosocomial infection, surgery and trauma, prophylaxis, travel and recreation, and bioterrorism.

Organism-specific chapters follow, with individual chapters for specific bacteria, viruses, fungi, parasites, and other pathogens. Finally, a major section on antimicrobial therapy includes chapters on principles of antibiotic therapy, antifungal therapy, antiviral therapy, and hypersensitivity to antibiotics. A final chapter lists antimicrobial agents in tabular form, providing a convenient reference for dosage, side effects, cost, pregnancy class, effect of food, and dose adjustment for renal dysfunction. All chapters include suggested readings.

For this new edition every chapter has been updated, and four new chapters have been added: Tungiasis and bedbugs (in Skin and lymph nodes), Biologics (in Compromised host), Antibacterial agents (in Antimicrobial therapy), and Probiotics (in Antimicrobial therapy).

We hope this text continues to provide a practical, clinically oriented, and convenient resource for the diagnosis and treatment of infectious disease.

I am enormously grateful for the vision, talent, and dedication of the staff at Cambridge University Press, particularly Richard Marley, Jane Seakins, Rob Sykes, Ross Higman, Sarah Payne, Anne Kenton, and Ed Robinson.