DISCLOSURE OF POTENTIAL CONFLICTS OF INTEREST

Consultancies: Lisa Dumkow (QIAGEN); Cory M. Hale (Seqirus); Bruce M. Jones (Allergan/AbbVie; Paratek; Tetraphase; Merck); Alex Kashmanian (Delaware Healthcare Acquired Infection Advisory Committee); Wesley D. Kufel (Theratechnologies, Inc.); Monica V. Mahoney (Tetraphase; Spero; Qpex; Merck); Eric Wenzler (Shionogi; Cepheid; GenMark; Merck)

Stock Ownership: Cory M. Hale (Novavax)

Royalties: John Boreyko (bioMerieux); Richard Drew (UpToDate)

Grants: Travis J. Carlson (Society of Infectious Diseases Pharmacists, Merck and Co.); Angela M. Huang (Merck); Bruce M. Jones (Merck; ALK); Wesley D. Kufel (Melinta, Merck); Eric Wenzler (Shionogi, Daiichi-Sankyo, Bristol-Myers Squibb, Merck, Paratek Pharmaceuticals, Cystic Fibrosis Foundation, Astellas; CDC)

Honoraria: Travis J. Carlson (Merck and Co.); Monica V. Mahoney (Tetraphase; ACCP; Pharmacy Times); Eric Wenzler (Melinta; Astellas; Allergan)

Other:

Nothing to disclose: Mohamed Hisham Basheer, Craig J. Beavers, Christo L. Cimino, Mary A. Hutton, Douglas Jennings, Travis M. Jones, Jeffrey A. Kyle, Nicholas Ladikos, Tiffany Lee, Rosanna Li, Audrey Littlefield, Nicholas Mercuro, Jerod Nagel, Elizabeth Neuner, Cynthia T. Nguyen, Kelsey Olson, Courtney Pagels, Twisha S. Patel, Emily Weisz, Christy Yost

ROLE OF BPS: The Board of Pharmacy Specialties (BPS) is an autonomous division of the American Pharmacists Association (APhA). To maintain its strict, independent standards for certification, BPS does NOT endorse or provide review information, preparatory courses, or study guides for Board Certification Examinations. The Board, through its specialty councils, is responsible for specialty examination content, administration, scoring, and all other aspects of its certification programs. BPS is totally separate and distinct from ACCP. IDSAP has been approved by BPS for use in BCIDP recertification. Information about the BPS recertification process is available online.

Questions regarding BCIDP recertification should be directed to:

Board of Pharmacy Specialties

2215 Constitution Avenue NW Washington, DC 20037 (202) 429-7591

Cardiopulmonary Infections I Panel

Series Editors:

Elizabeth S. Dodds Ashley, Pharm.D., MHS, BCPS

Associate Professor of Medicine
Division of Infectious Diseases
Duke University School of Medicine
Director of Operations
Duke Antimicrobial Stewardship Outreach Network
(DASON)
Durham, North Carolina

Alan E. Gross, Pharm.D., BCPS, BCIDP

Clinical Associate Professor

Department of Pharmacy Practice
University of Illinois at Chicago College of Pharmacy
Infectious Diseases Pharmacist
Hospital Pharmacy Services
University of Illinois Hospital and Health Sciences System
Chicago, Illinois

Faculty Panel Chair:

Richard H. Drew, Pharm.D., MS, FCCP, FIDP

Professor of Medicine (Infectious Diseases)

Duke University School of Medicine

Professor and Vice Chair of Research and Scholarship

Campbell University College of Pharmacy and Health

Sciences

Durham, North Carolina

Infective Endocarditis

Author

Twisha Patel, Pharm.D., BCPS, BCIDP

Pharmacist, Prevention Team
Chenega Enterprise Systems and Solutions (CHESS)
International Infection Control Program
Division of Healthcare Quality Promotion
National Center for Emerging and Zoonotic Infectious
Diseases
Centers for Disease Control and Prevention
Atlanta, Georgia

Reviewers

Jeffrey A. Kyle, Pharm.D., BCPS

Vice Chair and Director of Experiential Education
Professor
Department of Pharmacy Practice
McWhorter School of Pharmacy/Samford University
Clinical Pharmacy Specialist
Shelby Baptist Medical Center
Birmingham, Alabama

Courtney Pagels, Pharm.D., BCIDP

Clinical Pharmacy Specialist, Infectious Diseases Advocate Good Samaritan Hospital Downers Grove, Illinois

Rosanna Li, Pharm.D., BCIDP

Infectious Diseases Pharmacist
Department of Pharmacy
Maimonides Medical Center
Brooklyn, New York

Implantable Cardiac-assist Devices and Vascular Graft Infections

Authors

Audrey Littlefield, Pharm.D., BCPS, BCCCP

Pharmacy Manager
Perioperative Services and Controlled Substances
New York-Presbyterian Hospital
New York, New York

Douglas Jennings, Pharm.D., FCCP, FACC, FHFSA, BCPS

Associate Professor of Pharmacy Practice
Department of Pharmacy Practice
Long Island University
New York, New York

Director of Cardiovascular Services

Reviewers

Craig J. Beavers, Pharm.D., FCCP, FACC, FAHA, BCCP, BCPS-AQ Cardiology, CACP

Baptist Health Paducah

Cardiovascular Clinical Pharmacist

Department of Pharmacy Services

UK Healthcare

Assistant Adjunct Professor

Department of Pharmacy Practice and Science
University of Kentucky College of Pharmacy

Paducah, Kentucky

Alexander Kashmanian Pharm.D., BCPS, BCIDP

Clinical Pharmacist
Department of Pharmacy
Bayhealth Medical Center
Milford, Delaware

Mohamed Hisham Basheer, Pharm.D., BCCCP., BCIDP

Clinical Staff Pharmacist
Department of Pharmacy Services
Cleveland Clinic Abu Dhabi

Abu Dhabi, United Arab Emirates

The American College of Clinical Pharmacy and the authors thank the following individuals for their careful review of the Cardiopulmonary Infections I chapters:

Anne L. Hume, Pharm.D., FCCP, BCPS

Professor of Pharmacy
Department of Pharmacy Practice
University of Rhode Island
Kingston, Rhode Island
Adjunct Professor of Family Medicine
Alpert School of Medicine at Brown University
Providence, Rhode Island

Marisel Segarra-Newnham, Pharm.D., MPH, FCCP, BCPS, BCIDP

Clinical Pharmacy Specialist, Infectious Diseases/HIV Antimicrobial Stewardship Program Pharmacy Director Veterans Affairs Medical Center West Palm Beach, Florida Clinical Assistant Professor of Pharmacy Practice University of Florida College of Pharmacy Gainesville, Florida

Cardiopulmonary Infections II Panel

Series Editors:

Elizabeth S. Dodds Ashley, Pharm.D., MHS, BCPS

Associate Professor of Medicine
Division of Infectious Diseases
Duke University School of Medicine
Director of Operations
Duke Antimicrobial Stewardship
Outreach Network (DASON)
Durham, North Carolina

Alan E. Gross, Pharm.D., BCPS, BCIDP

Clinical Associate Professor
Department of Pharmacy Practice
University of Illinois at Chicago College of Pharmacy
Infectious Diseases Pharmacist
Hospital Pharmacy Services
University of Illinois Hospital and Health Sciences System
Chicago, Illinois

Faculty Panel Chair:

Richard H. Drew, Pharm.D., MS, FCCP, FIDP

Professor of Medicine (Infectious Diseases)

Duke University School of Medicine

Professor and Vice Chair of Research and Scholarship

Campbell University College of Pharmacy and Health

Sciences

Durham, North Carolina

Infections in Persons Who Inject Drugs

Authors

Tiffany Lee, Pharm.D., BCIDP

Clinical Pharmacy Specialist, Infectious Diseases
Department of Pharmacy
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania

Monica V. Mahoney, Pharm.D., FCCP, BCPS, BCIDP

Clinical Pharmacy Specialist
Department of Pharmacy
Beth Israel Deaconess Medical Center
Boston, Massachusetts

Reviewers

Christo L. Cimino, Pharm.D., BCPS, BCIDP

Clinical Pharmacist Specialist, Infectious Diseases PGY2 Infectious Diseases Pharmacy Residency Program Director Department of Pharmaceutical Services Vanderbilt University Medical Center Nashville, Tennessee

Kelsey Olson, Pharm.D., BCIDP

Infectious Diseases Clinical Pharmacist
Department of Pharmacy
HCA Houston Healthcare Clear Lake
Webster, Texas

Diagnostic Testing for Bacterial Pneumonia

Authors

Nicholas Mercuro, Pharm.D., BCIDP

Infectious Diseases Clinical Pharmacist
Department of Pharmacy
Maine Medical Center
Portland, Maine

Eric Wenzler, Pharm.D., BCPS, BCIDP, AAHIVP

Assistant Professor and Infectious Diseases Clinical Pharmacist Department of Pharmacy Practice University of Illinois at Chicago Chicago, Illinois

Reviewers

Bruce M. Jones, Pharm.D., FIDSA, BCPS

Infectious Diseases Clinical Pharmacy Specialist St. Joseph's/Candler Health System, Inc. Savannah, Georgia

Travis J. Carlson, Pharm.D., BCIDP

Assistant Professor
Department of Clinical Sciences
High Point University Fred Wilson School of Pharmacy
High Point, North Carolina

John Boreyko, Pharm.D., BCIDP

Clinical Infectious Diseases Pharmacist Department of Pharmacy Duke Regional Hospital Durham, North Carolina The American College of Clinical Pharmacy and the authors thank the following individuals for their careful review of the Cardiopulmonary Infections II chapters:

Elizabeth S. Dodds Ashley, Pharm.D., MHS, BCPS

Associate Professor of Medicine
Division of Infectious Diseases
Duke University School of Medicine
Director of Operations
Duke Antimicrobial Stewardship
Outreach Network (DASON)
Durham, North Carolina

Ralph H. Raasch, Pharm.D., FCCP, BCPS

Associate Professor of Pharmacy (retired)
Division of Practice Advancement and Clinical Education
Eshelman School of Pharmacy
The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina

Cardiopulmonary Infections III Panel

Series Editors:

Elizabeth S. Dodds Ashley, Pharm.D., MHS, BCPS

Associate Professor of Medicine
Division of Infectious Diseases
Duke University School of Medicine
Director of Operations
Duke Antimicrobial Stewardship
Outreach Network (DASON)
Durham, North Carolina

Alan E. Gross, Pharm.D., BCPS, BCIDP

Clinical Associate Professor

Department of Pharmacy Practice
University of Illinois at Chicago College of Pharmacy
Infectious Diseases Pharmacist
Hospital Pharmacy Services
University of Illinois Hospital and Health Sciences System
Chicago, Illinois

Faculty Panel Chair:

Richard H. Drew, Pharm.D., MS, FCCP, FIDP

Professor of Medicine (Infectious Diseases)

Duke University School of Medicine

Professor and Vice Chair of Research and Scholarship

Campbell University College of

Pharmacy and Health Sciences

Durham, North Carolina

Bacterial Pneumonia Treatment

Author

Travis M. Jones, Pharm.D.

Infectious Diseases Clinical Pharmacist
Division of Infectious Diseases
Duke University Medical Center
Durham, North Carolina

Reviewers

Mary Hutton, Pharm.D., BCIDP

Antimicrobial Stewardship/Infectious Diseases Pharmacist
Department of Pharmacy
Intermountain Healthcare-Utah Valley Hospital
Provo, Utah

Nicholas Ladikos, Pharm.D., BCPS, BCGP, BCIDP

Pharmacy Management Lead, Clinical Operations
World Trade Center Health Program
Optum Care/UnitedHealth Care
La Crosse, Wisconsin

Viral Pneumonia Treatment

Author

Angela Huang, Pharm.D., BCIDP

Clinical Pharmacy Specialist—Infectious Diseases
Department of Pharmacy
Mayo Clinic
Phoenix, Arizona

Reviewers

Elizabeth A. Neuner, Pharm.D., BCPS, BCIDP

Clinical Specialist, Antimicrobial Stewardship/Infectious Diseases Department of Pharmacy Barnes-Jewish Hospital St. Louis, Missouri

Wesley D. Kufel, Pharm.D., BCPS, BCIDP, AAHIVP

Clinical Assistant Professor
Department of Pharmacy Practice
Binghamton University School of Pharmacy
and Pharmaceutical Sciences
Binghamton, New York
Clinical Pharmacy Specialist, Infectious Diseases
Department of Pharmacy
State University of New York Upstate University Hospital
Clinical Assistant Professor
Department of Medicine
State University of New York Upstate Medical University
Syracuse, New York

The American College of Clinical Pharmacy and the authors thank the following individuals for their careful review of the Cardiopulmonary Infections III chapters:

Alan E. Gross, Pharm.D., BCPS, BCIDP

Clinical Associate Professor
Department of Pharmacy Practice
University of Illinois at Chicago College of Pharmacy
Infectious Diseases Pharmacist
Hospital Pharmacy Services
University of Illinois Hospital and Health Sciences System
Chicago, Illinois

Ralph H. Raasch, Pharm.D., FCCP, BCPS

Associate Professor of Pharmacy (retired)
Division of Practice Advancement and Clinical Education
Eshelman School of Pharmacy
The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina

Cardiopulmonary Infections IV Panel

Series Editors:

Elizabeth S. Dodds Ashley, Pharm.D., MHS, BCPS

Associate Professor of Medicine
Division of Infectious Diseases
Duke University School of Medicine
Director of Operations
Duke Antimicrobial Stewardship
Outreach Network (DASON)
Durham, North Carolina

Alan E. Gross, Pharm.D., BCPS, BCIDP

Clinical Associate Professor
Department of Pharmacy Practice
University of Illinois at Chicago College of Pharmacy
Infectious Diseases Pharmacist
Hospital Pharmacy Services
University of Illinois Hospital and Health Sciences System
Chicago, Illinois

Faculty Panel Chair:

Richard H. Drew, Pharm.D., MS, FCCP, FIDP

Professor of Medicine (Infectious Diseases)

Duke University School of Medicine

Professor and Vice Chair of Research and Scholarship

Campbell University College of Pharmacy and

Health Sciences

Durham, North Carolina

Interactive Case: Stewardship Interventions for Optimizing Pneumonia Treatment

Author

Jerod Nagel, Pharm.D., BCIDP

Pharmacy Lead, Infectious Diseases and
Antimicrobial Stewardship
Department of Pharmacy
Michigan Medicine
Clinical Assistant Instructor
University of Michigan, College of Pharmacy
Ann Arbor, Michigan

Reviewers

Cynthia T. Nguyen, Pharm.D., BCIDP

Clinical Pharmacy Specialist, Infectious Diseases
Department of Pharmacy
University of Chicago Medicine
Chicago, Illinois

Cory M. Hale, Pharm.D., BCPS, BCIDP

Infectious Diseases Clinical Pharmacy Specialist
Department of Pharmacy
Penn State Health Milton S. Hershey Medical Center
Hershey, Pennsylvania

Interactive Case: Upper Respiratory Tract Infection Stewardship Interventions

Author

Lisa E. Dumkow, Pharm.D., BCIDP

Clinical Pharmacist, Antimicrobial Stewardship
Department of Pharmacy
Program Director, PGY-2 Infectious
Diseases Pharmacy Residency
Mercy Health Saint Mary's Hospital
Grand Rapids, Michigan

Reviewers

Christine N. Yost, Pharm.D., BCIDP

Clinical Pharmacy Specialist, Infectious Diseases
Department of Pharmacy
Beaumont Health
Royal Oak, Michigan

Emily E. Weisz, Pharm.D., BCPS, BCIDP

Clinical Pharmacy Specialist, Infectious Diseases Bridgeport Hospital Pharmacy Department Bridgeport Hospital Bridgeport, Connecticut

The American College of Clinical Pharmacy and the authors thank the following individuals for their careful review of the Cardiopulmonary Infections IV features:

Ishaq Lat, Pharm.D., MBA, FCCP, FCCM, BCCCP

Director of Pharmacy
Shirley Ryan Ability Lab
(Formerly the Rehabilitation Institute of Chicago)
Chicago, Illinois

Jennifer Le, Pharm.D., MAS, FCCP, FCSHP, FIDSA, BCPS-ID

Professor of Clinical Pharmacy Skaggs School of Pharmacy and Pharmaceutical Sciences University of California, San Diego La Jolla, California