

Fishman's Pulmonary Diseases and Disorders

Volume 1

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Fishman's Pulmonary Diseases and Disorders

Fourth Edition

Volume 1

Editor-in-Chief

Alfred P. Fishman, MD

William Maul Measey Professor of Medicine
University of Pennsylvania Medical Center
Philadelphia, Pennsylvania

Jack A. Elias, MD

Waldemar Von Zedtwitz Professor of Medicine
Chair, Department of Internal Medicine
Yale University School of Medicine
New Haven, Connecticut

Jay A. Fishman, MD

Associate Professor of Medicine
Harvard Medical School
Director, Transplant Infectious Disease and
Compromised Host Program
Massachusetts General Hospital
Associate Director, MGH Transplantation Center
Boston, Massachusetts

Michael A. Grippi, MD

Vice Chairman, Department of Medicine
Pulmonary, Allergy, and Critical Care Division
University of Pennsylvania Health System
Chief of Medicine, Philadelphia VA Medical Center
Philadelphia, Pennsylvania

Co-Editors

Robert M. Senior, MD

Dorothy R. and Hubert C. Moog Professor of
Pulmonary Diseases in Medicine
Professor of Cell Biology & Physiology
Washington University School of Medicine
St. Louis, Missouri

Allan I. Pack, MB, ChB, PhD

Professor of Medicine
Chief, Division of Sleep Medicine/Department
of Medicine
Director, Center for Sleep and Respiratory
Neurobiology
University of Pennsylvania School of Medicine
Philadelphia, Pennsylvania



Medical

New York Chicago San Francisco Lisbon London Madrid Mexico City Milan
New Delhi San Juan Seoul Singapore Sydney Toronto

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To Linda, Hannah; Mark, Martha, Eric; Sarah; Jay, Gayle, Aaron, and Brian
Alfred P. Fishman, MD

To Sandy, Lauren, Alma, and Gabby
Jack A. Elias, MD

To Barbara, Kristen, and Amy
Michael A. Grippi, MD

To Aaron, Brian, and Gayle
Jay A. Fishman, MD

To Martha, Jerry Flance, and Jack Pierce
Robert M. Senior, MD

To Fran, Alison, Angela, Andrew, and Allan Jr.
Allan I. Pack, MB, ChB, PhD

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Contributors

Muhanned A. Abu-Hijleh, MD, FCCP

Director, Interventional Pulmonology and Special
Procedures Unit
Clinical Assistant Professor of Medicine
Rhode Island Hospital/Brown Medical School
Division of Pulmonary, Sleep, and Critical Care Medicine
Providence, Rhode Island

Masazuni Adachi, MD, ScD

Professor of Pathology
State University of New York
Downstate Medical Center
Consultant
Department of Laboratories
Isaac Albert Research Institute
Kingsbrook Jewish Medical Center
Brooklyn, New York

Sheela Y. Ahmed, MD

Fellow, Division of Pulmonary and Critical Care Medicine
Oregon Health and Sciences University
Portland, Oregon

Abass Alavi, MD

Professor of Radiology and Director of Research Education
Division of Nuclear Medicine
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania

Steven M. Albelda, MD

William Maul Measey Professor of Medicine
Pulmonary, Allergy, and Critical Care Division
University of Pennsylvania Medical Center
Philadelphia, Pennsylvania

Murray D. Altose, MD

Professor of Medicine
Case Western Reserve University School of Medicine
Chief of Staff
Cleveland VA Medical Center
Cleveland, Ohio

Andrea J. Apter, MD, MSc

Associate Professor of Medicine
University of Pennsylvania
Section of Allergy and Immunology
Division of Pulmonary Allergy Critical Care Medicine
University of Pennsylvania Health System
Philadelphia, Pennsylvania

Jeffrey J. Atkinson, MD

Assistant Professor
Division of Pulmonary and Critical Care
Washington University School of Medicine
St. Louis, Missouri

Santhosh M. Baby, PhD

Postdoctoral Research Fellow
Department of Physiology and Pennsylvania Muscle Institute
University of Pennsylvania School of Medicine
Philadelphia, Pennsylvania

John R. Bach, MD

Professor of Physical Medicine and Rehabilitation
Professor of Neurosciences
Vice Chairman
Department of Physical Medicine and Rehabilitation
UMDNJ-New Jersey Medical School
Newark, New Jersey

Zubair W. Baloch, MD, PhD

Associate Professor Pathology and Laboratory Medicine
University of Pennsylvania School of Medicine
Staff Pathologist
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania

Alan F. Barker, MD

Professor of Medicine
Division of Pulmonary and Critical Care Medicine
Oregon Health and Sciences University
Portland, Oregon

Contributors

Michael F. Beers, MD

Associate Professor of Medicine
Pulmonary and Critical Care Division
Department of Medicine
University of Pennsylvania School of
Medicine
Philadelphia, Pennsylvania

Lisa M. Bellini, MD

Associate Professor of Medicine
University of Pennsylvania School of
Medicine
Philadelphia, Pennsylvania

Saverio Bellusci, PhD

The Developmental Biology Program
Saban Research Institute
Children's Hospital of Los Angeles
University of Southern California Keck School of
Medicine and School of Dentistry
Los Angeles, California

John A. Belperio, MD

Assistant Professor of Medicine
Division of Pulmonary and Critical Care
Medicine
David Geffen School of Medicine at UCLA
Los Angeles, California

Jeffrey S. Berman, MD

Professor of Medicine
Boston University School of Medicine
Chief, Pulmonary Medicine and Associate
Chief, Medical Service
Boston Veterans Administration Health Care
Boston, Massachusetts

Luca Bigatello, MD

Department of Anesthesia and Critical Care
Massachusetts General Hospital
Department of Anesthesia
Harvard Medical School
Boston, Massachusetts

Reshma Biniwale, MD

Cardiothoracic Surgery Fellow
Department of Cardiothoracic Surgery
Montefiore Medical Center
Bronx, New York

Richard C. Boucher, MD

Kenan Professor of Medicine
Director, Cystic Fibrosis/Pulmonary Research and
Treatment Center
University of North Carolina
Chapel Hill, North Carolina

Sidney S. Braman, MD, FCCP

Director, Division of Pulmonary
Pulmonary, Sleep, and Critical Care Medicine
Professor of Medicine
Rhode Island Hospital/Brown Medical School
Providence, Rhode Island

Peter H. Burri, MD

Institute of Anatomy
University of Bern
Bern, Switzerland

William W. Busse, MD

Professor and Chair of Medicine
University of Wisconsin Medical School
Madison, Wisconsin

Francis A. Caccavo, MS

Chief of the Core Laboratory
Kingsbrook Jewish Medical Center
Brooklyn, New York

Hilary C. Cain, MD

Assistant Professor
Department of Internal Medicine
Section of Pulmonary and Critical Care Medicine
Yale University School of Medicine
New Haven, Connecticut

Jeffrey P. Callen, MD

Professor of Medicine (Dermatology)
Chief, Division of Dermatology
University of Louisville
Louisville, Kentucky

Edward J. Campbell, MB, BS, FRACP, PhD

Department of Internal Medicine
University of Utah Health Care
Salt Lake City, Utah

Kenneth G. Castro, MD

Centers for Disease Control and Prevention
Division of Tuberculosis Elimination
Atlanta, Georgia

David M. Center, MD

Chief, Pulmonary, Allergy, and Critical Care Medicine
Gordon and Ruth Snider Professor of Pulmonary Medicine
Professor of Medicine and Biochemistry
Boston University School of Medicine
Boston, Massachusetts

Robert J. Cerfolio, MD, FACS, FCCP

Professor of Surgery
Department of General Surgery
Division of Cardiothoracic Surgery
Chief of Section of Thoracic Surgery
University of Alabama
Birmingham, Alabama

Richard E. Chaisson, MD

Professor of Medicine
Epidemiology and International Health
Johns Hopkins University School of Medicine
Baltimore, Maryland

Georgios Chamilos, MD

Postdoctoral Research Fellow
Department of Infectious Diseases
Infection Control and Employee Health
The University of Texas M. D. Anderson Cancer
Center
Houston, Texas

Neil S. Cherniack, MD

Case Western Reserve University
Cleveland, Ohio
New Jersey School of Medicine
University of Medicine and Dentistry
Newark, New Jersey

Jason D. Christie, MD, MSCE

Assistant Professor of Medicine
Division of Pulmonary
Pulmonary, Allergy and Critical Care Medicine
Department of Medicine
Assistant Professor of Epidemiology
Department of Biostatistics and Epidemiology
Senior Fellow
Center of Epidemiology and Biostatistics
University of Pennsylvania School of Medicine
Philadelphia, Pennsylvania

Geoffrey Chupp, MD

Associate Professor of Medicine
Director, Yale Center for Asthma and Airways Disease
Division of Pulmonary and Critical Care Medicine
Yale School of Medicine
New Haven, Connecticut

Andrew Churg, MD, PhD

Professor, Department of Pathology
University of British Columbia
Vancouver, British Columbia, Canada

John P. Chute, MD

Associate Professor of Medicine
Assistant Professor of Pharmacology and Cancer
Biology
Division of Cellular Therapy
Duke University Medical Center
Durham, North Carolina

James M. Clark, MD

Institute for Environmental Medicine
University of Pennsylvania School of Medicine
Philadelphia, Pennsylvania

J. Allen D. Cooper, Jr., MD

University of Alabama Hospital
Birmingham, Alabama

Gregory P. Cosgrove, MD

Assistant Professor and Assistant Director
Interstitial Lung Disease Program
National Jewish Medical and Research Center
University of Colorado Health Sciences Center
Denver, Colorado

Gerard J. Criner, MD

Professor of Medicine
Chair, Division of Pulmonary and Critical Care
Medicine
Temple University School of Medicine
Philadelphia, Pennsylvania

Kristina Crothers, MD

Assistant Professor of Medicine
Section of Pulmonary and Critical Care
Department of Internal Medicine
Yale University School of Medicine
New Haven, Connecticut

Thomas A. Cumbo, MD

Clinical Associate Professor of Medicine
University at Buffalo
State University of New York
Buffalo, New York

Jeffrey L. Curtis, MD

Professor
Department of Internal Medicine
University of Michigan Medical School
Ann Arbor, Michigan

David M. Daughton

University of Nebraska Medical Center
Omaha, Nebraska

Ian C. Davis, DVM, PhD

Assistant Professor
Department of Anesthesiology
University of Alabama at Birmingham
Birmingham, Alabama

Malcolm M. DeCamp, Jr., MD

Chief, Division of Cardiothoracic Surgery
Beth Israel Deaconess Medical Center
Boston, Massachusetts

Contributors

Marc Decramer

Respiratory Division University Hospital
Katholieke Universiteit Leuven
Afdeling Pneumologie
Leuven, Belgium

Stijn DeLanghe, PhD

The Developmental Biology Program
Saban Research Institute
Children's Hospital Los Angeles
University of Southern California Keck School of
Medicine and School of Dentistry
Los Angeles, California

Pierre Del Moral

The Developmental Biology Program
Saban Research Institute
Children's Hospital Los Angeles
University of Southern California Keck School of
Medicine and School of Dentistry
Los Angeles, California

Horace M. Delisser, MD

Pulmonary, Allergy, and Critical Care Division
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania

Clifford S. Deutschman, MS, MD, FCCM

Professor of Anesthesiology and Critical Care
and Surgery
University of Pennsylvania School of
Medicine
Philadelphia, Pennsylvania

Robert P. Dickson, MD

Department of Medicine
University of Washington
Seattle, Washington

Camillo DiGiulio, MD

Professor
Department of Biomedical Sciences
G. d'Annunzio University
Chieti-Pescara, Italy

Francis W. DiPierro, MD

Eastern Maine Medical Center
Bangor, Maine

Scott H. Donaldson, MD

Assistant Professor of Medicine
University of North Carolina
Chapel Hill, North Carolina

Marlene L. Durand, MD

Assistant Professor
Harvard Medical School
Director, Infectious Disease Service
Massachusetts Eye and Ear Infirmary
Associate Physician
Massachusetts General Hospital
Boston, Massachusetts

Ghassan El-Haddad, MD

Department of Nuclear Oncology
Division of Nuclear Medicine
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania

Jack A. Elias, MD

Waldemar Von Zedtwitz Professor of
Medicine
Chair, Department of Internal Medicine
Yale University School of Medicine
New Haven, Connecticut

Richard I. Enelow, MD

Associate Professor of Medicine
Yale University School of Medicine
New Haven, Connecticut
VA Connecticut Health Care System
West Haven, Connecticut

Perenlei Enkhbaatar, MD, PhD

Assistant Professor
The University of Texas Medical Branch
Galveston, Texas

Paul E. Epstein, MD

Clinical Professor of Medicine
University of Pennsylvania
Philadelphia, Pennsylvania

John J. W. Fangman, MD

Assistant Professor of Medicine
Division of Infectious Disease
Medical College of Wisconsin
Milwaukee, Wisconsin

Peter F. Fedullo, MD

Director
Medical Intensive Care Unit
Professor of Clinical Medicine
University of California
San Diego, California

Alan M. Fein, MD

ProHealth Care Associates
Lake Success, New York

Steven H. Feinsilver, MD

Associate Professor of Medicine (Clinical)
New York University School of Medicine
New York, New York
Director
Pulmonary and Sleep Medicine
Cardiovascular Medical Associates
Garden City, New York

Alfred P. Fishman, MD

William Maul Measey Professor of Medicine
University of Pennsylvania Medical Center
Philadelphia, Pennsylvania

Jay A. Fishman, MD

Associate Professor of Medicine
Harvard Medical School
Director
Transplant Infectious Disease and Compromised
Host Program
Massachusetts General Hospital
Associate Director
MGH Transplantation Center
Boston, Massachusetts

Douglas B. Flieder, MD

Department of Pathology
Fox Chase Cancer Center
Philadelphia, Pennsylvania

Barry D. Fuchs, MD

Pulmonary, Allergy, and Critical Care Division
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania

Gregory P. Geba, MD

Assistant Professor of Pulmonary Medicine
Department of Internal Medicine
Yale University
New Haven, Connecticut

Charles F. P. George, MD, FRCPC, FCCP, DABSM

Professor of Medicine
University of Western Ontario
Director
Sleep Medicine Clinic and Laboratory
London Health Sciences Centre
London, Ontario, Canada

Stanley Goldfarb, MD

Associate Dean
Clinical Education
University of Pennsylvania School of Medicine
Philadelphia, Pennsylvania

Mitchell Goldman, MD

Associate Professor of Medicine
Indiana University School of Medicine
Indianapolis, Indiana

Daniel M. Goodenberger, MD

Professor and Chair
Department of Internal Medicine
University of Nevada School of Medicine
Las Vegas, Nevada

Reginald E. Greene, MD

Radiology Division
Massachusetts General Hospital
Boston, Massachusetts

Michael A. Grippi, MD

Vice Chairman, Department of Medicine
Pulmonary, Allergy, and Critical Care Division
University of Pennsylvania Health System
Chief of Medicine, Philadelphia VA Medical Center
Philadelphia, Pennsylvania

Mridu Gulati, MD, MPH

Assistant Professor of Medicine
Pulmonary and Critical Care Medicine
Occupational and Environmental Medicine
Department of Medicine
Yale University School of Medicine
New Haven, Connecticut

Prabodh K. Gupta, MB, MD

Professor Pathology and Laboratory Medicine
University of Pennsylvania School of Medicine
Director Cytopathology and Cytometry
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania

Jesse B. Hall, MD

Professor of Medicine
Department of Medicine
Section of Pulmonary and Critical Care
University of Chicago
Chicago, Illinois

C. William Hanson III, MD

Professor of Anesthesiology and Critical Care
Surgery and Internal Medicine
University of Pennsylvania School of Medicine
Philadelphia, Pennsylvania

Judith Hellman, MD

Department of Anesthesia and Critical Care
Massachusetts General Hospital
Charlestown, Massachusetts

Contributors

Lisa M. Hepp

University of Nebraska Medical Center
Omaha, Nebraska

Michael P. Hlastala, PhD

Professor of Physiology and Biophysics and
Medicine
University of Washington
Seattle, Washington

Robert J. Homer, MD, PhD

Associate Professor of Pathology
Department of Pathology
Yale University School of Medicine
Director of Anatomic Pathology
VA Connecticut Healthcare System
New Haven, Connecticut

Michael F. Iademarco, MD, MPH

Centers for Disease Control and Prevention
Division of Tuberculosis Elimination
Atlanta, Georgia

Louise C. Ivers, MD, MPH, DTM&H

Partners In Health
Harvard Medical School
Division of Infectious Diseases
Massachusetts General Hospital
Boston, Massachusetts

Bruce E. Johnson, MD

Associate Professor of Medicine
Harvard Medical School
Boston, Massachusetts

David H. Johnson, MD

Cornelius A. Craig Professor of Medicine
Director
Division of Hematology and Oncology
Vanderbilt-Ingram Cancer Center
Nashville, Tennessee

JeRay J. Johnson, MD

Fellow in Pulmonary and Critical Care Medicine
Section on Pulmonary, Critical Care
Care, Allergy and Immunologic Diseases
Department of Internal Medicine
Wake Forest University School of Medicine
Winston-Salem, North Carolina

Larry R. Kaiser, MD

John Rhea Barton Professor and Chairman
Department of Surgery
University of Pennsylvania
Philadelphia, Pennsylvania

Petros C. Karakousis, MD

Assistant Professor
Center for Tuberculosis Research
Johns Hopkins University School of Medicine
Baltimore, Maryland

Michael P. Keane, MD

Department of Medicine
Division of Pulmonary and Critical Care Medicine
UCLA
Los Angeles, California

Steven M. Keller, MD

Department of Cardiothoracic Surgery
Montefiore Medical Center
Bronx, New York

Mark A. Kelley, MD

Executive Vice President
Henry Ford Health System
Detroit, Michigan

Steven G. Kelsen, MD

Division of Pulmonary Medicine
Temple University Hospital
Philadelphia, Pennsylvania

Jeffrey A. Kern, MD

Professor, Case Western Reserve University
Division Chief, Pulmonology/Critical Care and
Sleep Medicine
University Hospitals
Cleveland, Ohio

Brent W. Kinder, MD

Pulmonary Fellow
Department of Medicine
University of California
San Francisco, California

Talmadge E. King, Jr., MD

The Constance B. Wofsy Distinguished Professor
and Vice-Chairman
Department of Medicine
University of California
San Francisco
Chief, Medical Services
San Francisco General Hospital
San Francisco, California

Robert A. Klocke, MD

Professor Emeritus of Medicine and Physiology and Biophysics
University of Buffalo
Erie County Medical Center
Buffalo, New York

Kenneth Knox, MD

Richard L. Roudebush Veterans' Administration Hospital
Indianapolis, Indiana

**Dimitrios P. Kontoyiannis, MD, ScD,
FACP, FIDSA**

Associate Professor of Medicine
Director of Clinical Mycology
Department of Infectious Diseases
Infection Control and Employee Health
The University of Texas M. D. Anderson Cancer
Center
Houston, Texas

Robert M. Kotloff, MD

Professor of Medicine
Pulmonary, Allergy, and Critical Care Division
Department of Medicine
University of Pennsylvania Medical Center
Philadelphia, Pennsylvania

Camille Nelson Kotton, MD

Infectious Diseases Unit
Massachusetts General Hospital
Boston, Massachusetts

Richard Kradin, MD

Associate Professor
Harvard Medical School
Director of Infectious Disease Pathology
Department of Pathology and the Pulmonary and
Critical Care Unit
Massachusetts General Hospital
Boston, Massachusetts

Mary Elizabeth Kreider, MD

Pulmonary and Critical Care Section
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania

John P. Kress, MD

Assistant Professor of Medicine
Department of Medicine
Section of Pulmonary and Critical Care
University of Chicago
Chicago, Illinois

Meir H. Kryger, MD, FRCPC

Sleep Disorders Center
St. Boniface General Hospital
Section of Respiratory Diseases
University of Manitoba, Winnipeg
Manitoba, Canada

**Sukhamay Lahiri, D Phil (Oxon),
D Phil (Cal)**

Professor
Department of Physiology
University of Pennsylvania School of Medicine
Philadelphia, Pennsylvania

Kenneth S. Landreth, PhD

Professor of Microbiology
Immunology and Cell Biology
West Virginia University School of Medicine
Morgantown, West Virginia

John D. Lang, Jr., MD

Associate Professor
Department of Anesthesiology
University of Alabama at Birmingham
Birmingham, Alabama

Paul N. Lanken, MD

Professor of Medicine
Division of Pulmonary
Allergy and Critical Care Medicine
Department of Medicine
Professor of Medical Ethics
Department of Medical Ethics
Senior Fellow, Center for Bioethics
University of Pennsylvania School of Medicine
Philadelphia, Pennsylvania

Richard S. Lazzaro, MD

Attending Surgeon
Maimonides Medical Center
Brooklyn, New York

James W. Leatherman, MD

Hennepin Faculty Associates
Hennepin County Medical Center
Minneapolis, Minnesota

Deborah J. Levine, MD

Assistant Professor
Division of Pulmonary Disease
Department of Medicine
The University of Texas Health Science Center
San Antonio, Texas

Frederic F. Little, MD

Assistant Professor of Medicine
Boston University School of Medicine
Boston, Massachusetts

Leslie A. Litzky, MD

Associate Professor
Department of Pathology and Laboratory Medicine
Director
Section of Medical Pathology
University of Pennsylvania Medical Center
Philadelphia, Pennsylvania

Philip A. LoBue, MD

Centers for Disease Control and Prevention
Division of Tuberculosis Elimination
Atlanta, Georgia

Contributors

Joseph LoCicero, III, MD

Director Surgical Oncology Maimonides Cancer
Center
Brooklyn, New York

Nicholas W. Lukacs, PhD

Department of Pathology
University of Michigan Medical School
Ann Arbor, Michigan

Joseph P. Lynch III, MD

Professor of Clinical Medicine
Associate Chief, Division of Pulmonary,
Critical Care Medicine, and Hospitalists
David Geffen School of Medicine at UCLA
Los Angeles, California

Mitchell Machtay, MD

Walter J. Curran Associate Professor and
Vice Chair
Department of Radiation Oncology
Jefferson Medical College
Philadelphia, Pennsylvania

Scott Manaker, MD, PhD

Associate Professor of Medicine
Pulmonary, Allergy and Critical Care
Division
University of Pennsylvania Medical Center
Philadelphia, Pennsylvania

Nathaniel Marchetti, DO

Assistant Professor of Medicine
Division of Pulmonary and Critical Care
Medicine
Temple University School of Medicine
Philadelphia, Pennsylvania

Thomas J. Marrie, MD

Dean
Faculty of Medicine and Dentistry
Walter C. Mackenzie Health Sciences
Center
Edmonton, Alberta, Canada

Fernando J. Martinez, MD, MS

Professor of Internal Medicine
University of Michigan Medical School
Ann Arbor, Michigan

Sadis Matalon, PhD

Professor
Department of Anesthesiology
University of Alabama at Birmingham
Birmingham, Alabama

Sameer K. Mathur, MD, PhD

Clinical Instructor
University of Wisconsin Medical School
Madison, Wisconsin

Michael A. Matthay, MD

Professor
Medicine and Anesthesia
Senior Associate
Cardiovascular Research Institute
Associate Director
Intensive Care Unit
University of California
San Francisco, California

Martin L. Mayse, MD

Assistant Professor of Medicine and Surgery
Director, Interventional Pulmonology
Washington University
St. Louis, Missouri

John R. McArdle, MD

Assistant Professor of Medicine
Pulmonary and Critical Care Section
Yale University School of Medicine
New Haven, Connecticut

F. Dennis McCool, MD

Professor of Medicine
Brown University Medical School
Chief, Pulmonary Critical Care Medicine
Memorial Hospital of Rhode Island
Pawtucket, Rhode Island

Paul B. McCray, Jr., MD

Professor
Department of Pediatrics
Roy J. and Lucille A. Carver College of Medicine
University of Iowa
Iowa City, Iowa

Geoffrey McLennan, MD, PhD

Professor, Pulmonary, Critical Care, and
Occupational Medicine
University of Iowa
Iowa City, Iowa

Ranee Mehra, MD

Associate Member
Fox Chase Cancer Center
Philadelphia, Pennsylvania

Eric B. Meltzer, MD

Fellow
Department of Medicine
Division of Pulmonary, Allergy, and Critical Care
Duke University Medical Center
Durham, North Carolina

Wallace T. Miller, MD

Emeritus Professor
Department of Radiology
University of Pennsylvania School of Medicine
University of Pennsylvania Medical Center
Philadelphia, Pennsylvania

David R. Moller, MD

Associate Professor of Medicine
Johns Hopkins University School of Medicine
Baltimore, Maryland

David G. Morris, MD

Assistant Professor of Medicine
Director
Interstitial Lung Diseases Program
Yale University School of Medicine
Division of Pulmonary and Critical Care
Medicine
Yale-New Haven Hospital
New Haven, Connecticut

Adrian R. Morrison, DVM, PhD

Professor
Laboratory for Study of the Brain in Sleep
Department of Animal Biology
School of Veterinary Medicine
University of Pennsylvania
Philadelphia, Pennsylvania

Ahmad Munir

Assistant Professor of Medicine
University of Tennessee Health Science Center
Memphis, Tennessee

David M. F. Murphy, MD

Deborah Heart and Lung Center
Browns Mills, New Jersey

Timothy F. Murphy, MD

UB Distinguished Professor of Medicine
Chief, Division of Infectious Diseases
University at Buffalo
State University of New York
Buffalo, New York

Michael A. Nead, MD, PhD

Senior Instructor in Medicine
Pulmonary and Critical Care
Department of Internal Medicine
University of Rochester Medical Center
Strong Memorial Hospital and Highland Hospital
Department of Pulmonary and Critical Care
Rochester, New York

Patrick Neligan, MD

Department of Anesthesia
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania

Michael S. Niederman, MD

Professor and Vice-Chairman
Department of Medicine
SUNY at Stony Brook
Stony Brook, New York
Chairman
Department of Medicine
Winthrop-University Hospital
Mineola, New York

Paul W. Noble, MD

Professor of Medicine and Division Chief
Department of Pulmonary, Allergy, and Critical
Care Medicine
Duke University School of Medicine
Durham, North Carolina

Matthias Ochs, MD

Lecturer
Experimental Morphology Unit
Institute of Anatomy
University of Berne
Berne, Switzerland

David Ost, MD

Department of Cardiothoracic Surgery
Division of Thoracic Surgery
New York University
New York, New York

Allan I. Pack, MB, ChB, PhD

Professor of Medicine
Chief, Division of Sleep Medicine/Department of Medicine
Director
Center for Sleep and Respiratory Neurobiology
University of Pennsylvania School of Medicine
Philadelphia, Pennsylvania

Kevin Palka, MD

Instructor in Medicine
Division of Hematology and Oncology
Vanderbilt-Ingram Cancer Center
Nashville, Tennessee

Reynold A. Panettieri, Jr., MD

Pulmonary, Allergy and Critical Care Division
University of Pennsylvania Medical Center
Philadelphia, Pennsylvania

Annie Pardo, PhD

Facultad de Ciencias
Universidad Nacional Autónoma de México
Ciudad Universitaria, Mexico

Contributors

John E. Parker, MD

Professor and Section Chief
 Section of Pulmonary and Critical Care Medicine
 Robert C. Byrd Health Sciences Center
 West Virginia University School of Medicine
 Morgantown, West Virginia

Rodolfo M. Pascual, MD

Assistant Professor of Medicine
 Section on Pulmonary
 Critical Care, Allergy and Immunologic Diseases
 Department of Internal Medicine
 Wake Forest University School of Medicine
 Winston-Salem, North Carolina

Mark S. Pasternack, MD

Associate Professor of Pediatrics
 Division of Infectious Diseases
 Massachusetts General Hospital
 Boston, Massachusetts

Aalpen A. Patel, MD

Assistant Professor of Radiology and Surgery
 Department of Radiology
 Interventional Radiology
 University of Pennsylvania School of Medicine
 Philadelphia, Pennsylvania

Nirav P. Patel, MD

Division of Sleep Medicine
 University of Pennsylvania
 Philadelphia, Pennsylvania

Rakesh P. Patel, PhD

Assistant Professor
 Department of Pathology
 University of Alabama at Birmingham
 Birmingham, Alabama

Jay Peters, MD

Division Chief and Fellowship Director
 Division of Pulmonary Disease/Critical Care
 Professor, Department of Medicine
 The University of Texas Health Science Center
 San Antonio, Texas

**Stephen P. Peters, MD, PhD, FACP, FCCP,
FAAAAI, FCPP**

Professor of Medicine and Pediatrics
 Director of Research
 Section on Pulmonary, Critical Care
 Allergy and Immunologic Diseases
 Training Program Director, Allergy and Immunology
 Department of Internal Medicine and Center for Human
 Genomics
 Wake Forest University School of Medicine
 Winston-Salem, North Carolina

Edward L. Petsonk, MD

Adjunct Professor
 Section of Pulmonary and Critical Care Medicine
 Robert C. Byrd Health Sciences Center
 West Virginia University School of Medicine
 Senior Medical Officer
 Division of Respiratory Disease Studies
 National Institute for Occupational Safety and Health
 Morgantown, West Virginia

Jennifer A. Philips, MD, PhD

Associate Physician
 Department of Medicine
 Division of Infectious Diseases
 Brigham and Women's Hospital
 Boston, Massachusetts

Gerald B. Pier, PhD

Professor of Medicine (Microbiology and Molecular
 Genetics)
 Harvard Medical School
 Channing Laboratory
 Department of Medicine
 Brigham and Women's Hospital
 Boston, Massachusetts

John Popovich, Jr., MD, MACP

Chair
 Department of Internal Medicine
 Henry Ford Hospital
 Detroit, Michigan

Gregory Priebe, MD

Assistant Professor of Anaesthesia (Pediatrics)
 Harvard Medical School
 Channing Laboratory
 Department of Medicine
 Brigham and Women's Hospital
 Departments of Anesthesiology (Critical Care) and Medicine
 (Infectious Diseases)
 Children's Hospital
 Boston, Massachusetts

Jonathan Puchalski, MD

Fellow in Pulmonary Medicine
 Division of Pediatric Pulmonary Medicine
 Cincinnati Children's Hospital
 Division of Pulmonary and Critical Care Medicine
 University of Cincinnati College of Medicine
 Cincinnati, Ohio

Carrie A. Redlich, MD, MPH

Professor of Medicine
 Pulmonary and Critical Care Medicine
 Occupational and Environmental Medicine
 Department of Medicine
 Yale University School of Medicine
 New Haven, Connecticut

Steven I. Rennard, MD

Pulmonary and Critical Care Medicine
University of Nebraska Medical Center
Omaha, Nebraska

Herbert Y. Reynolds, MD

Professor of Medicine Emeritus
The Pennsylvania State University College of Medicine
and Milton S. Hershey Medical Center
Hershey, Pennsylvania
Adjunct Professor of Medicine
Uniformed Services University of the Health
Sciences
Bethesda, Maryland

Mary L. Ricardo-Dukelow, MD

Clinical Instructor
Department of Internal Medicine
University of Nebraska Medical Center
Omaha, Nebraska

Andrew L. Ries, MD, MPH

Associate Dean for Academic Affairs
Professor of Medicine and Family and Preventive
Medicine
University of California
San Diego
Medical Director
Pulmonary Rehabilitation Program
University of California
San Diego Medical Center

John R. Roberts, MD, MBA

The Surgical Clinic, PLLC
Nashville, Tennessee

Kenneth B. Roberts, MD

Associate Professor of Therapeutic Radiology
Yale University School of Medicine
Attending Physician
Yale-New Haven Hospital
New Haven, Connecticut

Carolyn L. Rochester, MD

Associate Professor of Medicine
Section of Pulmonary and Critical Care
Department of Internal Medicine
Yale University School of Medicine
New Haven, Connecticut

Sara Rockwell, PhD

Professor
Department of Therapeutic Radiology
Yale University School of Medicine
New Haven, Connecticut

William N. Rom, MD, MPH

Sol and Judith Bergstein Professor of Medicine and Professor
of Environmental Medicine
Departments of Medicine (Pulmonary Disease) and
Environmental Medicine
New York University Medical Center
New York, New York

Daniel B. Rosenbluth, MD

Associate Professor of Medicine
Division of Pulmonary and Critical Care Medicine
Washington University School of Medicine
St. Louis, Missouri

Milton D. Rossman, MD

Pulmonary and Critical Care Section
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania

Eric J. Rubin, MD, PhD

Associate Professor of Immunology and Infectious
Diseases
Harvard School of Public Health
Boston, Massachusetts

Mark E. Rupp, MD

Professor
Department of Internal Medicine
University of Nebraska Medical Center
Nebraska Medical Center
Omaha, Nebraska

Edward T. Ryan, MD

Assistant Professor of Medicine
Harvard Medical School
Assistant Professor of Immunology and Infectious
Diseases
Harvard School of Public Health
Director
Tropical and Geographic Medicine Center
Massachusetts General Hospital
Boston, Massachusetts

Steven A. Sahn, MD

Professor of Medicine and Director
Division of Pulmonary, Critical Care
Allergy and Sleep Medicine
Medical University of South Carolina
Charleston, South Carolina

Edward Y. Sako, MD, PhD

Professor
Department of Surgery
The University of Texas Health Science Center
San Antonio, Texas

Contributors

Jonathan M. Samet, MD, MS

Professor and Chairman
 Department of Epidemiology
 Director
 Institute for Global Tobacco Control
 Jacob I and Irene B. Fabrikant Professor in Health
 Risk and Society
 Johns Hopkins Bloomberg School of Public Health
 Baltimore, Maryland

Paul E. Sax, MD

Associate Professor of Medicine
 Harvard Medical School
 Clinical Director
 Division of Infectious Diseases and HIV Program
 Brigham and Women's Hospital
 Boston, Massachusetts

Thomas F. Scanlin, MD

Professor of Pediatrics
 University of Medicine & Dentistry of New Jersey
 Chief, Division of Pulmonary Medicine and Cystic
 Fibrosis Center
 Bristol-Myers Squibb Children's Hospital at Robert Wood
 Johnson University Hospital
 New Brunswick, New Jersey

Johannes C. Schittny, PhD

Institute of Anatomy
 University of Bern
 Bern, Switzerland

Edward S. Schulman, MD

Professor of Medicine
 Director
 Division of Pulmonary and Critical Care Medicine
 Drexel University College of Medicine
 Philadelphia, Pennsylvania

Richard J. Schwab, MD

University of Pennsylvania Medical Center
 Pulmonary, Allergy and Critical Care Division
 Philadelphia, Pennsylvania

David A. Schwartz, MD

Director
 National Institute of Environmental Health Sciences
 Research Triangle Park
 North Carolina

Marvin I. Schwarz, MD

The James C. Campbell Professor of Pulmonary Medicine
 Director
 Pulmonary Sciences and Critical Care Medicine
 Fellowship
 University of Colorado Health Sciences Center
 Denver, Colorado

Luis M. Seijo, MD

Associate Clinical Professor
 Residency Program Director
 Pulmonary Division
 Clínica Universitaria de Navarra
 Pamplona, Spain

Moisés Selman, MD

Instituto Nacional de Enfermedades Respiratorias
 México

Robert M. Senior, MD

Dorothy R. and Hubert C. Moog Professor of Pulmonary
 Diseases in Medicine
 Professor of Cell Biology & Physiology
 Washington University School of Medicine
 St. Louis, Missouri

Kumar Sharma, MD, FAHA

Professor of Medicine
 Director Center for Diabetic Kidney Disease
 Thomas Jefferson University
 Department of Medicine
 Division of Nephrology
 Philadelphia, Pennsylvania

Stuart F. Sidlow, MD

Assistant Professor in Anesthesiology and Critical Care
 University of Pennsylvania School of Medicine
 Philadelphia, Pennsylvania

Michael S. Simberkoff, MD

Chief of Staff
 VA New York Harbor Healthcare System
 Professor of Medicine
 New York University School of Medicine
 New York, New York

Neel R. Sodha, MD

Department of Surgery
 Division of Cardiothoracic Surgery
 Beth Israel Deaconess Medical Center and Harvard
 Medical School
 Boston, Massachusetts

Ulrich Specks, MD

Professor of Medicine
 Mayo Clinic College of Medicine
 Division of Pulmonary and Critical Care Medicine
 Mayo Clinic
 Rochester, Minnesota

Peter H. S. Sporn, MD

Professor of Medicine
 Division of Pulmonary and Critical Care Medicine
 Feinberg School of Medicine
 Northwestern University
 Chicago, Illinois

Daniel H. Serman, MD

Associate Professor of Medicine
 Associate Professor of Medicine in Surgery
 Director of Interventional Pulmonology
 Clinical Director
 Thoracic Oncology Gene Therapy Program
 Pulmonary, Allergy and Critical Care Division
 University of Pennsylvania Medical Center
 Philadelphia, Pennsylvania

Robert M. Strieter, MD

Professor and Chief
 Division of Pulmonary and Critical Care Medicine
 Vice Chair of the Department of Medicine
 Professor of Pathology and Pediatrics
 David Geffen School of Medicine at UCLA
 Los Angeles, California

Erik R. Swenson, MD

Professor of Medicine and Physiology and
 Biophysics
 University of Washington
 Seattle, Washington

Darren B. Taichman, MD, PhD

Assistant Professor of Medicine
 Director, Medical Intensive Care Unit
 Penn-Presbyterian Medical Center
 Associate Director
 Pulmonary Vascular Disease Program
 Hospital of the University of Pennsylvania
 Philadelphia, Pennsylvania

Lynn T. Tanoue, MD

Associate Professor of Medicine
 Pulmonary and Critical Care Section Yale University
 School of Medicine
 New Haven, Connecticut

Denise Tefft, PhD

Developmental Biology Program
 Saban Research Institute
 Children's Hospital Los Angeles
 University of Southern California Keck School of
 Medicine and School of Dentistry
 Los Angeles, California

Erica R. Thaler, MD

Associate Professor of Otorhinolaryngology
 University of Pennsylvania School of Medicine
 Philadelphia, Pennsylvania

Karen J. Tietze, PharmD

Professor of Clinical Pharmacy
 University of the Sciences
 Philadelphia, Pennsylvania

Gregory Tino, MD

Pulmonary, Allergy, and Critical Care Division
 Hospital of the University of Pennsylvania
 Philadelphia, Pennsylvania

Martin J. Tobin, MD

Division of Pulmonary and Critical Care
 Medicine
 Edward Hines Jr Veterans Affairs Hospital
 and Stritch School of Medicine
 Loyola University of Chicago
 Hines, Illinois

Galen B. Toews, MD

Associate Dean for Research and Graduate
 Studies
 Medical School
 Professor of Internal Medicine
 Chief, Division of Pulmonary and Critical Care
 Medicine
 The University of Michigan Health System
 Ann Arbor, Michigan

Daniel L. Traber, PhD

Professor
 The University of Texas Medical Branch
 Galveston, Texas

Bruce C. Trapnell, MD

Director
 Rare Lung Diseases Consortium
 Professor
 Departments of Medicine and Pediatrics
 University of Cincinnati College of Medicine
 Cincinnati Children's Research Foundation
 Cincinnati, Ohio

John Treanor, MD

Professor of Medicine
 Infectious Diseases Unit
 University of Rochester Medical Center
 Rochester, New York

Joseph Treat, MD

Attending Physician
 Department of Medical Oncology
 Fox Chase Cancer Center
 Philadelphia, Pennsylvania

Scott O. Trerotola, MD

Professor of Radiology and Surgery
 Department of Radiology
 Interventional Radiology
 University of Pennsylvania School of Medicine
 Philadelphia, Pennsylvania

Contributors

George E. Tzelepis, MD

Associate Professor of Medicine
University of Athens Medical School
Chief, Pulmonary Services
Laiko University Hospital
Athens, Greece

Michael Unger, MD, FACP, FCCP

Director
Pulmonary Cancer Detection and Prevention
Program
Director
Pulmonary Endoscopy and High-Risk Lung Cancer
Program
Fox Chase Cancer Center
Philadelphia, Pennsylvania

Mark J. Utell, MD

Professor of Medicine and of Environmental
Medicine
Director
Occupational Medicine Program and Associate
Chair of Environmental Medicine
Director
Pulmonary Unit
University of Rochester Medical Center
Rochester, New York

Anil Vachani, MD

Assistant Professor
Department of Medicine
Division of Pulmonary, Allergy and Critical Care
University of Pennsylvania
Philadelphia, Pennsylvania

Judith A. Voynow, MD

Associate Professor of Pediatrics
Duke University Medical Center
Durham, North Carolina

Peter D. Wagner, MD

Department of Medicine
University of California San Diego
La Jolla, California

John C. Wain, MD

Division of Thoracic Surgery
Massachusetts General Hospital and Harvard
Medical School
Boston, Massachusetts

David Warburton, DSc, MD, FRCP

Developmental Biology Program
The Saban Research Institute
Children's Hospital
Los Angeles, California

Peter A. Ward, MD

Department of Pathology
University of Michigan Medical School
Ann Arbor, Michigan

Susan A. Ward, DPhil

Institute of Membrane and Systems Biology
University of Leeds, Leeds, UK

Karl T. Weber, MD

Division of Cardiology
Memphis Medical Center
Memphis, Tennessee

Ewald R. Weibel, MD, DSc

Professor Emeritus
Institute of Anatomy
University of Berne
Berne, Switzerland

Arnold N. Weinberg, MD

Infectious Diseases Unit
Massachusetts General Hospital
Boston, Massachusetts

Scott T. Weiss, MD, MSc

Professor of Medicine
Harvard Medical School
Channing Laboratory
Department of Medicine
Brigham and Women's Hospital
Boston, Massachusetts

David N. Weissman, MD

National Institute for Occupational Safety and Health
Centers for Disease Control and Prevention
Morgantown, West Virginia

Michael J. Welsh, MD

Professor
Howard Hughes Medical Institute
Departments of Internal Medicine and Physiology and
Biophysics
Roy J. and Lucille A. Carver College of Medicine
University of Iowa
Iowa City, Iowa

L. Joseph Wheat, MD

President and Director
MiraVista Diagnostics
Indianapolis, Indiana

Brian J. Whipp, PhD, DSc

Institute of Membrane and Systems Biology
Faculty of Biological Sciences
University of Leeds
Leeds, United Kingdom

Jeffrey A. Whitsett, MD

Chief, Section of Neonatology
Perinatal and Pulmonary Biology
Department of Pediatrics
Cincinnati Children's Hospital Medical Center and the
University of Cincinnati College of Medicine
Cincinnati, Ohio

Kevin C. Wilson, MD

Assistant Professor of Medicine
Boston University School of Medicine
Boston, Massachusetts
Deputy Editor
Pulmonary, Critical Care, and Sleep Medicine
UpToDate
Waltham, Massachusetts

Nevin W. Wilson, MD, FAAP, FAAAAI

Professor and Chair, Department of Pediatrics
University of Nevada School of Medicine
Reno, Nevada

Robert A. Wise, MD

Professor of Medicine
Pulmonary and Critical Care Medicine
Johns Hopkins University School of Medicine
Baltimore, Maryland

Daniel F. Worsley, MD

Assistant Professor
University of British Columbia
Chief, Division of Nuclear Medicine
Vancouver General Hospital
Vancouver, British Columbia, Canada

Cameron D. Wright, MD

Associate Professor of Surgery
Harvard Medical School
Associate Division Chief
Department of Thoracic Surgery
Massachusetts General Hospital
Boston, Massachusetts

Joanne L. Wright, MD, FRCP(C)

Department of Pathology
University of British Columbia
Vancouver, British Columbia, Canada

Gordon L. Yung, MB, BS

Director
Advance Lung Disease Program
Associate Clinical Professor of
Medicine
University of California
San Diego, California

Richard D. Zorowitz, MD

Associate Professor
Department of Physical Medicine and
Rehabilitation
University of Pennsylvania School of
Medicine
Medical Director
Piersol Rehabilitation Unit
Hospital of the University of
Pennsylvania
Philadelphia, Pennsylvania

Preface

This book is now in its fourth edition. The first edition appeared in print in 1980. Each edition since then has provided a contemporary update of the growth of understanding of pulmonary disease and of the management of its clinical manifestations. Advances have been made in leaps and bounds. A 2006 review (Lopez et al.) summarized the impressive progress made in three key subsets of pulmonary medicine, chronic obstructive pulmonary disease (COPD), asthma, and critical care medicine.

COPD affords a practical illustration of the growth in understanding of a prevalent disease. The designation COPD, originally adopted as a convenient term for communication about the spectrum of chronic bronchitis and emphysema, now covers a wide range of clinical entities, ranging from predominant inflammation of the airways to disruption and over-expansion of the pulmonary parenchyma in emphysema.

COPD is the fourth leading cause of chronic morbidity and mortality in the United States. More than 12 million people have COPD and an additional 12 million do not know that they have the disease. Of all the leading killers, COPD is the only disease with mortality rates that are on the rise. World Health Organization projections indicate COPD will become the third leading cause of mortality worldwide by 2020.

Smoking is a predominant etiologic factor for COPD. However, as many as one of six people with COPD have never smoked. It is also understood that not all who smoke pay the price in terms of lung disease. The rates among women have dramatically increased since World War II. Vulnerability to harmful effects of smoking is believed to be rooted, at least in part, in genetic predisposition. This likelihood is currently under active investigation.

One particular limitation of the term “COPD” was recently highlighted by the advent of lung volume reduction surgery (LVRS) for the treatment of emphysema. It was clear from the outset that not all patients with emphysema are suitable candidates for LVRS. A major step toward the identification of those patients with emphysema who can be expected to benefit from the procedure was taken by the National Em-

physema Treatment Trial (NETT). This trial, unique in its co-sponsorship by three federal agencies—The National Heart, Lung & Blood Institute (NHLBI), The Health Care Finance Agency (HCFA) and the Agency for Health Care Policy and Research (AHCPR), began by excluding those patients with emphysema who were not likely to benefit from LVRS. These proved to be patients with a low FEV₁ in conjunction with either homogeneous emphysema or a very low diffusing capacity for carbon monoxide (DLCO). In patients who proved to be eligible for LVRS, NETT took into account the risks posed by the surgical procedure and the fact that it affords no guarantee of successful outcome.

A second major study addressed the global impact of COPD. It has been estimated that in the United States almost 12 million people have COPD. Smoking has long been known to be the predominant cause of COPD, but attempts at promoting widespread smoking cessation have largely been ineffective. Currently, COPD is being attacked on a variety of research fronts. Among these is the link between COPD and lung cancer. Other research is directed at clarifying the role of inflammation in the pathogenesis of COPD and trials of therapeutic interventions to minimize the ravages of the disease. Among the on-going trials are investigations which seek to determine the therapeutic effectiveness of novel agents, such as the phosphodiesterase inhibitors (PDE4 inhibitors). Other trials, using monoclonal antibodies seek to modify the inflammatory component of COPD. The global impact of COPD continues to provide impetus to the search for mechanisms that can be attacked therapeutically.

Looking back, the growth of pulmonary medicine has been punctuated and accelerated by certain iconic breakthroughs. Diagnostic radiology was revolutionized in the early 1990's by the introduction of spiral-computed tomography (CAT scan), which afforded a novel way to image the lung. Since then, improvements in the technology of the apparatus have enhanced its value as a diagnostic tool while enabling smaller doses of radiation to be delivered to the patients. Because of its ease of use and its availability, the use of the CAT scan has become widespread. In addition, continuing refinements hold promise of enhancing the

visualization of the microarchitecture of the lungs in health and disease.

Technological advances have played a key role in affording insights not only into the microarchitecture of the lungs but also into their physiological functions. Recent advances hold promise of even more to come. For example, the advent of virtual bronchoscopy has brought with it the likelihood of access to information about the bronchial tree and its surrounding structures without subjecting the patient to the stress of direct bronchoscopy. Moreover, the meaning of “virtual” continues to enlarge. Originally, the term referred to two-dimensional representations of the bronchial tree obtained by x-ray computed tomography (CT). Currently, the term also applies to more detailed images and less-intrusive methods obtained by such techniques as ultrasound or magnetic resonance imaging (MRI).

The newer imaging techniques not only afford static representations of the details of the airways and pulmonary parenchyma but also hold promise for functional studies, e.g., dynamic studies of pulmonary mechanics. Such studies would deal not only with the mechanics of the entire lung but also with the mechanics of regions of the lung. The increase in resolution on the one hand, and in the ease of acquisition of data on the other, has also enabled application of non-invasive imaging to the exploration of such functions of the lungs as ventilation-perfusion relationships.

Pulmonary medicine continues to be on the march. In recent years, the inclusion of sleep-disordered breathing has widened the scope of pulmonary medicine. National meetings devoted to pulmonary medicine attract ever-increasing audiences. This edition of “Pulmonary Diseases and Disorders” deals with the current understanding of lung diseases and the management of these diseases. Even a cursory comparison of this edition with previous editions reveals that considerable progress has been made in recent years. Despite this impressive progress, it is clear that much remains to be done. Patients and pulmonologists can look forward to further developments in the years ahead.

The experience and knowledge of each of the editors have been directed at ensuring that the specialized, as well as the general, aspects of pulmonary medicine have been expertly covered and well presented. Although the book is a collective effort, discussion and debate among the editors and authors have led to a collaborative and comprehensive work, integrated by a meeting of the minds and the sharing of the experiences. By the process of peer review, the book aspires to provide a readable and balanced coverage of what is latest and most meaningful in pulmonary diseases and disorders.

I have already indicated how much this book owes to the experts who comprise the editorial board. The editors, in turn, would have little to work with were it not for the splendid chapters contributed by the individual authors. And, in this edition, we also were aided by several medical fellows. My special thanks to Charles De La Cruz, Colin Gillespie, Howard Huang, Josh Kayser, Bianca Monteiro, Stephen Ryan, and Rael Sundry for their assistance. The editors also benefited greatly from close collaboration with the publisher whose personnel

have listened carefully and implemented with patience and understanding.

I owe a great deal to those close to home. Betsy Ann Bozzarello, a collaborator for more than 20 years, managed to free time for me to devote to the book while she catalyzed and orchestrated the efforts of others. My family has provided the encouragement and peace of mind that such an effort inevitably calls for. My wife, Linda, has been unwavering in her tolerance and support. My daughter, Hannah, who is in her junior year at the University of Michigan and is trying her own hand at writing, is impressed by the enormity of the undertaking but remains optimistic about the outcome of such a venture. My sons, Mark and Jay, authors and editors in their own rights, share my conviction that this book is a worthwhile undertaking. Their spouses, Gayle and Martha, the former a nurse and the latter a pediatric pulmonologist, have also been supportive. I am greatly indebted to all of the above.

Alfred P. Fishman

SUGGESTED READING

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Alfred P. Fishman, MD
 Jack A. Elias, MD
 Jay A. Fishman, MD
 Michael A. Grippi, MD
 Robert M. Senior, MD
 Allaan I. Pack, MB, ChB, PhD