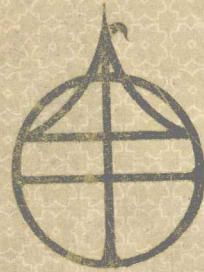


18th edition

CECIL

TEXTBOOK

OF



MEDICINE

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TEXTBOOK OF MEDICINE



Edited by

JAMES B. WYNGAARDEN, M.D.

Director, National Institutes of Health,
Bethesda, Maryland

LLOYD H. SMITH, Jr., M.D.

Professor of Medicine and Associate Dean,
University of California, San Francisco, School of Medicine,
San Francisco, California

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DOSAGE NOTICE

Every effort has been made by the authors, the editors, and the publisher of this book to ensure that dosage recommendations are precise and in agreement with the standards of practice accepted at the time of publication.

However, dosage schedules are changed from time to time in the light of accumulating clinical experience and continuing laboratory studies. This is most likely to occur in the case of recently introduced products.

We urge, therefore, that you check the package information data for the manufacturer's recommended dosage to be certain that changes have not been made in the recommended dose or in the contraindications for administration. In addition, there are some quite serious situations in which drug therapy must be individualized and expert judgment advises the use of a higher dosage or administration by a different route than is included in the manufacturer's recommendations. Throughout the text examples of such instances are indicated by a footnote.

THE EDITORS

ALSO ASSOCIATED WITH THE CECIL TEXTBOOK OF MEDICINE

Review of General Internal Medicine: A Self-Assessment Manual 4th Edition, 1988

Editors: Lloyd H. Smith, Jr., M.D., James B. Wyngaarden, M.D.

The fourth edition of this self-assessment book contains approximately 1200 questions covering all the specialty areas of internal medicine. The answers are linked to the Cecil Textbook of Medicine and to other readily available sources.

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PREFACE

Medicine is forever mutable. Although certain general principles remain, medical science moves on. Changes in medical practice follow—not in continuous flow, it is true, but nevertheless in rapid sequence. The pace has quickened as we approach the last decade of the twentieth century. New technologies have revolutionized molecular genetics, neurobiology, immunology, cell biology, and structural biology; the application of these disciplines to all branches of the traditional biomedical sciences proceeds apace. The structure of DNA was elucidated only a generation ago. Now it can be confidently predicted that the whole human genome of approximately three billion nucleotide base pairs (the information equivalent to a thousand large telephone books) will be sequenced within the next decade. The language of the new biology has already permeated medicine. Beyond these contributions from the biological sciences, new applications of the physical and mathematical sciences, especially in diagnostic imaging (CT, MRI, PET, sonography) and in the use of the computer, have radically altered medical practice. In such a climate of change medical competence itself is mutable. It must be constantly renewed or else it will erode.

In order to reflect the best in medical practice, a major textbook of medicine must also be constantly renewed. In that spirit this edition of the *Cecil Textbook of Medicine* has been thoroughly revised, the 18th such revision in a span of more than 60 years. Approximately one third of the book is "new" in that different authors have been selected, in this way assuring that their chapters have been completely recast. All other chapters have been revised and updated by their current authors, carefully chosen authorities in their respective subjects. A revised *Cecil* must reflect the problems of the day. As an example, nowhere is this more apparent than in its attention to the acquired immunodeficiency syndrome (AIDS), the most dramatic medical epidemic of our time. In the 17th edition of *Cecil*, this new and baffling syndrome was described in a single chapter of two pages in the section on Diseases of the Immune System. In this current edition are new chapters on "Retroviruses That Cause Human Disease" (R. C. Gallo), "Acquired Immunodeficiency Syndrome" (J. E. Groopman), "AIDS Dementia and Human Immunodeficiency Virus Brain Infection" (R. W. Price), "Cryptosporidiosis" (R. Soave), and "Giardiasis" (D. P. Stevens), as well as expanded descriptions of other disorders that accompany AIDS—Kaposi's sarcoma, pneumocystosis, *Mycobacterium avium-intracellulare* infections, etc. Examples of other chapters reflecting areas of medical progress include "Natriuretic Factors" (P. Needleman) and the expanded treatment of "Slow Virus Infections of the Nervous System." Lyme disease has been transferred from being listed as a form of infectious arthritis and now receives more extensive discussion as a systemic disorder in the section on Spirochetal Diseases. New chapters have been added on "Clinical Decision Making" (S. G. Pauker), "Control of Unintended Injuries and Those Due to Violence" (S. B. Hulley), and "The Health of the Physician" (L. H. Clever). All of these and many other changes throughout the 18th edition, including updated and annotated references, are designed to maintain the traditional theme of *Cecil* as providing "authoritative clinical guidance and a reasoned, scientific basis for the pursuit of medicine."

In this 18th edition the reader will note a major change in format, the first use of color in *Cecil* (other than that of color plates to illustrate specific entities). The introduction of this single additional color is designed to add clarity to headings and figures throughout the book. This innovation is part of a continuing program to make the book more attractive and easier to use.

Cecil not only stands alone; it is also the senior member of an extended family. Four current books are linked to the *Cecil Textbook of Medicine* by design, format, and editorial responsibility. *Cecil Essentials of Medicine* (edited by T. E. Andreoli, C. C. J. Carpenter, F. Plum, and L. H. Smith, Jr.) offers a more abbreviated description of the realm of internal medicine. Designed primarily for the medical student, for whom the authoritative compendium of *Cecil* may sometimes seem formidable, it does not attempt to be complete. Nevertheless it serves as a useful entry guide into the study of medicine. *Review of General Internal Medicine* (edited by the editors of *Cecil*) has appeared in a 4th edition in parallel with this 18th edition of *Cecil*. As before, its 1200 questions and answers are designed to be of general educational benefit as well as to reinforce the value of *Cecil* as a reference text. *Pathophysiology: The Biological Principles of Disease* (edited by L. H. Smith, Jr., and S. O. Thier) gives a more extensive description of the scientific basis of medical practice than can be contained within a book such as *Cecil*, which must devote most of its attention to the practicalities of clinical description, diagnosis, prognosis, and therapy. *Medical Microbiology and Infectious Diseases* (edited by the late A. I. Braude) gives a more extensive description of the world's experience with the infectious and parasitic diseases.

Editing a major textbook is a complex task, as one attempts to balance content, format, style, integration, and innovation. The editors have been privileged to work with an admirable group of colleagues in this shared responsibility. Fred Plum has continued in his role as Editor for Neurologic and Behavioral Diseases. We welcome Thomas W. Smith as our new Consulting Editor for Cardiovascular Diseases. He joins a seasoned team of fellow Consulting Editors: Thomas E. Andreoli (Renal Diseases), Charles C. J. Carpenter (Infectious Diseases), Robert J. Lefkowitz (Therapeutics), John F. Murray (Respiratory Diseases), David G. Nathan (Hematologic and Hematopoietic Diseases), William E. Paul (Immunology), and Marvin H. Sleisenger (Diseases of the Digestive System). The Consulting Editors continually review their respective sections of this complex book and bring us their ideas and expertise concerning modifications. Our special gratitude is extended to the 325 contributors who have written the 543 chapters that collectively comprise this 18th edition. The ultimate value and authenticity of *Cecil* lies not with the editors but with the scholarship and experience that these individual physicians and scientists have brought to this joint enterprise.

"Language is the armoury of the human mind; and at once contains the trophies of its past, and the weapons of its future conquests." The weaponry of language, in Coleridge's image above, does not always come fully burnished in submitted manuscripts. As in the 17th edition, we have been most fortunate to work with seasoned editorial assistants in Bethesda (Margaret Quinlan) and in San Francisco (Judith Serrell), without whose dedication and skill this large project could not have been completed. At W. B. Saunders Company, Lorraine Kilmer, Donna Walker, and Frank Polizzano carried out with experienced professionalism the intricate task of formatting, editing, and assembling the book, made more complex this time by the use of color. The overall editor at the W. B. Saunders Company for this 18th edition of *Cecil* was John Dyson, who has been an invaluable guide, colleague, and good friend. We are deeply indebted to him for his extensive contributions in bringing to completion this 18th edition of a venerable book.

JAMES B. WYNGAARDEN, M.D.

LLOYD H. SMITH, JR., M.D.

CONTRIBUTORS

FRANCOIS M. ABBOD, M.D.

Professor of Internal Medicine and of Physiology and Biophysics, University of Iowa College of Medicine. Head, Department of Internal Medicine, University of Iowa Hospitals and Clinics, Iowa City, Iowa.

Shock

DAVID H. ALPERS, M.D.

Professor of Medicine and Chief, Division of Gastroenterology, Washington University School of Medicine. Physician, Barnes Hospital; Consultant, Jewish Hospital of St. Louis, St. Louis, Missouri.

Principles of Nutritional Support: Enteral Nutritional Therapy

DAVID F. ALTMAN, M.D.

Associate Clinical Professor of Medicine and Associate Dean, University of California, San Francisco, School of Medicine. Attending Physician and Director, Gastroenterology Clinic, University of California Medical Center, San Francisco, California.

Food Poisoning; Diseases of the Rectum and Anus

WILLIAM J. C. AMEND, Jr., M.D.

Clinical Professor of Medicine and Surgery, University of California, San Francisco, School of Medicine. Attending Physician, Moffitt Hospital, San Francisco, California.

Renal Transplantation

W. FRENCH ANDERSON, M.D.

Chairman, Department of Medicine and Physiology, National Institutes of Health Graduate Program; Adjunct Professor, Graduate Genetics Program, George Washington University, Washington, D.C. Attending and Admitting Physician, Clinical Center, National Institutes of Health, Bethesda, Maryland.

Expectations from Recombinant DNA Research

THOMAS E. ANDREOLI, M.D.

Edward Randall, III Professor and Chairman, Department of Internal Medicine, University of Texas Medical School at Houston. Chief of Medicine, Hermann Hospital; Consultant, M. D. Anderson Hospital, Houston Texas.

Approach to the Patient with Renal Disease; Disorders of Fluid Volume, Electrolytes, and Acid-Base Balance; The Posterior Pituitary

VINCENT T. ANDRIOLE, M.D.

Professor of Internal Medicine and Chief, Infectious Disease Section, Yale University School of Medicine. Attending Physician, Yale-New Haven Hospital, New Haven, Connecticut.

Urinary Tract Infections and Pyelonephritis

CLAUDE D. ARNAUD, M.D.

Professor of Medicine and Physiology, University of California, San Francisco, School of Medicine. Chief, Endocrine Unit, Veterans Administration Medical Center, San Francisco, California.

Mineral and Bone Homeostasis; The Parathyroid Glands, Hypercalcemia, and Hypocalcemia; The Ultimobranchial Cells and Calcitonin

BERNARD M. BABIOR, M.D., Ph.D.

Member, Department of Basic and Clinical Research, Scripps Clinic and Research Foundation. Staff Physician, Division of Hematology-Oncology, Cecil H. and Ida M. Green Hospital of Scripps Clinic, La Jolla, California.

Function of Neutrophils and Mononuclear Phagocytes; Disorders of Neutrophil Function

GEORGE M. BAER, D.V.M.

Chief, Rabies Laboratory, Viral and Rickettsial Zoonoses Branch, Centers for Disease Control, Atlanta, Georgia.

Rabies

GROVER C. BAGBY, Jr., M.D.

Professor of Medicine and Head, Division of Hematology and Medical Oncology, Oregon Health Sciences Center School of Medicine. Acting Chief, Section of Hematology-Oncology, Veterans Administration Medical Center, Portland, Oregon.

Leukopenia; Leukocytosis and Leukemoid Reactions

ROBERT W. BALOH, M.D.

Professor of Neurology, University of California, Los Angeles, UCLA School of Medicine. Staff Physician, UCLA Medical Center and UCLA Neuropsychiatric Institute, Los Angeles, California.

The Special Senses

H. J. M. BARNETT, M.D.

Professor of Neurology, University of Western Ontario. Staff Physician, Clinical Neurological Sciences, University Hospital; The Verschoyle P. Cronyn Scientific Director and Chief Executive Officer of the John P. Roberts Research Institute, London, Ontario, Canada.

Introduction to Cerebrovascular Diseases; Cerebral Ischemia and Infarction; Spontaneous Intracranial Hemorrhage

ROBERT B. BARON, M.D.

Assistant Clinical Professor of Medicine, University of California, San Francisco, School of Medicine. Director of Screening and Acute Care, University of California, San Francisco, Hospitals and Clinics, San Francisco, California.

Protein-Calorie Undernutrition

DAVID W. BARRY, M.D.

Adjunct Professor of Medicine, Duke University School of Medicine. Vice-President of Research, Wellcome Research Laboratories, Burroughs Wellcome Company. Staff Physician, University Hospital, Durham, North Carolina.

Antiviral Therapy

WILLIAM H. BARRY, M.D.

Nora Eccles Harrison Professor of Cardiology, University of Utah School of Medicine. Attending Cardiologist, University of Utah Hospital, Salt Lake City, Utah.

Cardiac Catheterization and Angiography

JOHN G. BARTLETT, M.D.

Professor of Medicine, Johns Hopkins University School of Medicine. Chief, Division of Infectious Diseases, Johns Hopkins Hospital, Baltimore, Maryland.

Lung Abscess; Clostridial Myonecrosis and Other Clostridial Diseases; Pseudomembranous Colitis; Botulism; Tetanus

MICHAEL BARZA, M.D.

Professor of Medicine, Tufts University School of Medicine. Attending Physician, Department of Medicine, Division of Geographic Medicine and Infectious Diseases, New England Medical Center, Boston, Massachusetts.

Diseases Caused by Pseudomonads; Listeriosis; Erysipeloid

DAVID A. BASS, M.D., D.Phil.

Professor of Medicine, Division of Infectious Diseases and Immunology, Bowman Gray School of Medicine of Wake Forest University. Attending Physician in Infectious Diseases, North Carolina Baptist Hospital, Winston-Salem, North Carolina.

Eosinophilic Syndromes

STEPHEN G. BAUM, M.D.

Professor of Medicine, Mount Sinai School of Medicine of the City University of New York. Director, Department of Medicine, Beth Israel Medical Center; Associate Chairman, Department of Medicine, Mount Sinai Hospital, New York, New York.

Mycoplasmal Infections; Adenovirus Diseases

JOHN D. BAXTER, M.D.

Professor of Medicine and of Biochemistry and Biophysics, University of California, San Francisco, School of Medicine. Director, Metabolic Research Unit, and Chief, Section of Endocrinology, Moffitt Hospital, San Francisco, California.

Principles of Endocrinology; Disorders of the Adrenal Cortex

WILLIAM S. BECK, M.D.

Professor of Medicine and Tutor in Biochemical Sciences, Harvard Medical School. Physician and Director, Hematology Research Laboratory, Massachusetts General Hospital, Boston, Massachusetts.

Megaloblastic Anemias

CHARLES E. BECKER, M.D.

Professor of Medicine, University of California, San Francisco, School of Medicine. Head, Division of Occupational Medicine and Toxicology, San Francisco General Hospital, San Francisco, California.

Principles of Occupational Medicine

DONALD P. BECKER, M.D.

Professor of Surgery/Neurosurgery, University of California, Los Angeles, UCLA School of Medicine. Chief, Neurosurgical Service, UCLA Medical Center, Los Angeles, California.

Injuries to the Head and Spine

MICHAEL D. BENDER, M.D.

Associate Clinical Professor of Medicine, University of California, San Francisco, School of Medicine. Chief of Medicine and Director of Medical Education, Peninsula Hospital and Medical Center, Burlingame, California.

Diseases of the Peritoneum; Diseases of the Mesentery and Omentum

PAUL E. BENDHEIM, M.D.

Attending Neurologist and Head, Laboratory of Degenerative Neurologic Diseases, Department of Pathological Neurobiology, New York State Institute for Basic Research, Staten Island, New York.

Creutzfeldt-Jakob Disease

J. CLAUDE BENNETT, M.D.

Chairman and Professor, Department of Medicine, University of Alabama at Birmingham. Physician-in-Chief, University of Alabama Hospitals, Birmingham, Alabama.

Rheumatoid Arthritis

PAUL D. BERK, M.D.

Albert A. and Vera G. List Professor of Medicine and Chief, Division of Hematology, Mount Sinai School of Medicine of the City University of New York. Attending Physician, Mount Sinai Hospital and Bronx Veterans Administration Medical Center, New York, New York.

Erythrocytosis and Polycythemia; Myeloproliferative Disorders

J. THOMAS BIGGER, Jr., M.D.

Professor of Medicine and of Pharmacology, Columbia University College of Physicians and Surgeons. Attending Physician, Presbyterian Hospital in the City of New York; Director, Arrhythmia Control Unit, Columbia-Presbyterian Medical Center, New York, New York.

Cardiac Arrhythmias

DANIEL D. BIKLE, M.D., Ph.D.

Associate Professor of Medicine, University of California, San Francisco, School of Medicine. Co-Director, Special Diagnostic and Treatment Unit, Veterans Administration Medical Center; Attending Endocrinologist, University of California, San Francisco, Hospitals and Clinics, San Francisco, California.

Vitamin D; Osteomalacia and Rickets

J. MICHAEL BISHOP, M.D.

Professor of Medicine and Director, The G. W. Hooper Foundation, University of California, San Francisco, School of Medicine, San Francisco, California.

Oncogenes

ALAN L. BISNO, M.D.

Professor, Department of Medicine, Division of Infectious Diseases, University of Tennessee College of Medicine. Attending Physician, Memphis Regional Medical Center and University of Tennessee Medical Center; Consulting Physician, Baptist Memorial Hospital, Memphis, Tennessee.

Rheumatic Fever

D. MONTGOMERY BISSELL, M.D.

Professor of Medicine, University of California, San Francisco, School of Medicine. Attending Physician, University of California, San Francisco, Hospitals and San Francisco General Hospital Medical Center, San Francisco, California.

Porphyria

DANIEL S. BLUMENTHAL, M.D., M.P.H.

Professor and Chairman, Department of Community Health and Preventive Medicine, Morehouse School of Medicine. Attending Physician, Hughes Spalding Medical Center, Atlanta, Georgia.

Intestinal Nematodes; Angiostrongyliasis

GILES G. BOLE, M.D.

Professor of Internal Medicine, Associate Dean for Clinical Affairs, and Senior Associate Dean, University of Michigan Medical School. Attending Physician, University of Michigan Hospitals; Consultant, Ann Arbor Veterans Administration Hospital, Ann Arbor, Michigan.

Diseases Associated with Arthritis; Miscellaneous Forms of Arthritis; Non-articular Rheumatism; Synovial Tumors

THOMAS D. BOYER, M.D.

Associate Professor of Medicine, University of California, San Francisco, School of Medicine. Chief of Gastroenterology, Veterans Administration Medical Center, San Francisco, California.

Cirrhosis of the Liver; Major Sequelae of Cirrhosis

PHILIP S. BRACHMAN, M.D.

Professor, Master of Public Health Program, Department of Community Health, Emory University School of Medicine, Atlanta, Georgia.

Anthrax

JEROME S. BRODY, M.D.

Professor of Medicine and Director of Pulmonary Center, Boston University School of Medicine. Staff Physician, University Hospital and Boston City Hospital, Boston, Massachusetts.

Diseases of the Pleura, Mediastinum, Diaphragm, and Chest Wall

PHILIP A. BRUNELL, M.D.

Professor of Pediatrics, The University of Texas Medical School at San Antonio. Attending Physician, Medical Center Hospital and Santa Rosa Medical Center, San Antonio, Texas.

Varicella

JOHN D. BRUNZELL, M.D.

Professor of Medicine, University of Washington School of Medicine. Attending Physician, University Hospital, Seattle, Washington.

The Hyperlipoproteinemias

REBECCA H. BUCKLEY, M.D.

J. Buren Sidbury Professor of Pediatrics and Professor of Immunology, Duke University School of Medicine. Chief, Division of Allergy and Immunology, Department of Pediatrics, Duke University Medical Center, Durham, North Carolina.

Primary Immunodeficiency Diseases

WARD E. BULLOCK, M.D.

Arthur Russell Morgan Professor of Medicine and Director, Division of Infectious Diseases, University of Cincinnati College of Medicine, Cincinnati, Ohio.

Leprosy

PAUL A. BUNN, Jr., M.D.

Professor of Medicine and Head, Division of Medical Oncology, University of Colorado School of Medicine. Head, Division of Medical Oncology, University Hospital, Denver, Colorado.

Paraneoplastic Syndromes; Tumor Markers

DAVID M. BURNS, M.D.

Associate Professor of Medicine, University of California, San Diego, School of Medicine, La Jolla. Medical Director, Department of Respiratory Therapy, Division of Pulmonary and Critical Care Medicine, University of California Medical Center, San Diego, California.

Tobacco and Health

THOMAS BUTLER, M.D.

Associate Professor of Medicine, Case Western Reserve University School of Medicine. Attending Physician, University Hospitals of Cleveland, Cleveland, Ohio.

Typhoid Fever; Shigellosis; Yersinia Infections; Nonsyphilitic Treponematoses; Relapsing Fever

JOEL N. BUXBAUM, M.D.

Professor of Medicine, New York University School of Medicine. Chief, Rheumatology Section, Veterans Administration Medical Center; Attending Physician, Bellevue Hospital, New York, New York.

The Amyloid Diseases

PETER H. BYERS, M.D.

Professor, Departments of Pathology and Medicine (Medical Genetics), University of Washington School of Medicine, Seattle, Washington.

The Marfan Syndrome; The Ehlers-Danlos Syndrome

ANDREI CALIN, M.D.

Consultant Rheumatologist, Royal National Hospital for Rheumatic Diseases, Bath, Ireland.

The Spondyloarthropathies

CHARLES C. J. CARPENTER, M.D.

Professor of Medicine, Brown University Program in Medicine. Physician-in-Chief, Miriam Hospital, Providence, Rhode Island.

Introduction to Microbial Diseases

JOHN P. CELLO, M.D.

Associate Professor of Medicine, University of California, San Francisco, School of Medicine. Chief of Gastroenterology, San Francisco General Hospital Medical Center, San Francisco, California.

Carcinoma of the Pancreas

BRUCE A. CHABNER, M.D.

Director, Division of Cancer Treatment, National Cancer Institute, National Institutes of Health, Bethesda, Maryland.

Principles of Cancer Therapy

ROBERT M. CHANOCK, M.D.

Chief, Laboratory of Infectious Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland.

Respiratory Syncytial Virus; Parainfluenza Viral Diseases

BAYARD CLARKSON, M.D.

Professor of Medicine, Cornell University Medical College. Chief, Hematology/Lymphoma Service, Department of Medicine, Memorial Hospital for Cancer and Allied Diseases, New York, New York.

The Chronic Leukemias

LINDA HAWES CLEVER, M.D.

Clinical Professor of Medicine, University of California, San Francisco, School of Medicine. Chairman, Department of Occupational Health, Presbyterian Hospital of Pacific Presbyterian Medical Center, San Francisco, California.

The Health of the Physician

RAY E. CLOUSE, M.D.

Assistant Professor of Medicine, Washington University School of Medicine. Assistant Physician, Barnes Hospital, St. Louis, Missouri.

Parenteral Nutrition

CHARLES G. COCHRANE, M.D.

Adjunct Professor of Pathology, University of California, San Diego, School of Medicine. Member, Department of Immunology, Research Institute of Scripps Clinic, La Jolla, California.

Immune Complex Diseases

MARTIN G. COGAN, M.D.

Associate Professor of Medicine and Associate Staff Member, Cardiovascular Research Institute, University of California, San Francisco, School of Medicine. Attending Physician and Medical Director, Acute Hemodialysis Unit, Moffitt-Long Hospitals, San Francisco, California.
Specific Renal Tubular Disorders

ALAN S. COHEN, M.D.

Conrad Wesselhoft Professor of Medicine, Boston University School of Medicine. Chief of Medicine and Director, Thorndike Memorial Laboratory, Boston City Hospital, Boston, Massachusetts.
Specialized Diagnostic Procedures in the Rheumatic Diseases

JORDAN J. COHEN, M.D.

Professor and Associate Chairman of Medicine, University of Chicago Pritzker School of Medicine. Chairman of Medicine, Michael Reese Hospital and Medical Center, Chicago, Illinois.
Vascular Disorders of the Kidney

LAWRENCE S. COHEN, M.D.

The Ebenezer K. Hunt Professor of Medicine, Yale University School of Medicine. Attending Physician, Yale-New Haven Hospital, New Haven, Connecticut.
Diseases of the Aorta

WILLIAM G. COUSER, M.D.

Professor of Medicine, University of Washington School of Medicine. Head, Division of Nephrology, University Hospital, Seattle, Washington.
Glomerular Disorders

JAMES D. CRAPO, M.D.

Professor of Medicine, Duke University School of Medicine. Chief, Division of Allergy, Critical Care and Respiratory Medicine, Duke University Medical Center, Durham, North Carolina.
Physical, Chemical, and Aspiration Injuries of the Lung

PHILIP E. CRYER, M.D.

Professor of Medicine and Director, Metabolism Division, Washington University School of Medicine. Physician, Barnes Hospital, St. Louis, Missouri.
The Adrenal Medulla and The Sympathetic Nervous System; The Carcinoid Syndrome

RONALD G. CRYSTAL, M.D.

Chief, Pulmonary Branch, National Heart, Lung and Blood Institute, National Institutes of Health, Bethesda, Maryland.
Interstitial Lung Disease

ANTONIO R. DAMASIO, M.D.

Professor and Head of Neurology, University of Iowa College of Medicine. Attending Neurologist, University of Iowa Hospitals and Clinics, Iowa City, Iowa.
Regional Diagnosis of Cerebral Disorders; Focal Disturbances of Higher Functions

RONALD P. DANIELE, M.D.

Professor of Medicine and Pathology, University of Pennsylvania School of Medicine. Attending Physician and Director of the Interstitial Lung Disease Program, Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania.
Asthma

MICHAEL DECK, M.B., B.S.

Professor of Clinical Radiology, Cornell University Medical College. Attending Radiologist, Chief of Neuroradiology, and Vice-Chairman, Department of Radiology, New York Hospital, New York, New York.
Radiologic Imaging of the Neurologic Patient

ANDREW DEISS, M.D.

Associate Professor of Medicine, University of Utah School of Medicine. Associate Chief of Staff for Research and Development, Veterans Administration Medical Center, Salt Lake City, Utah.
Wilson's Disease

VINCENT W. DENNIS, M.D.

Professor of Medicine, Duke University School of Medicine. Chief, Division of Nephrology, Duke University Medical Center, Durham, North Carolina.
Investigations of Renal Function

IVAN DIAMOND, M.D., Ph.D.

Director, Ernest Gallo Clinic and Research Center; Vice-Chairman and Professor, Department of Neurology, and Professor of Pediatrics and Pharmacology, University of California, San Francisco, School of Medicine. Attending Neurologist, University of California, San Francisco, Hospitals, San Francisco General Hospital Medical Center, and Veterans Administration Medical Center, San Francisco, California.
Nutritional Disorders of the Nervous System

CHARLES A. DINARELLO, M.D.

Professor of Medicine and Pediatrics, Tufts University School of Medicine. Physician, New England Medical Center Hospital, Boston, Massachusetts.
Pathogenesis of Fever; The Acute Phase Response

RAPHAEL DOLIN, M.D.

Professor of Medicine, University of Rochester School of Medicine and Dentistry. Head, Infectious Diseases Unit, University of Rochester Medical Center and Strong Memorial Hospital, Rochester, New York.
Enteroviral Diseases

R. GORDON DOUGLAS, Jr., M.D.

E. Hugh Luckey Distinguished Professor in Medicine and Chairman, Department of Medicine, Cornell University Medical College. Physician-in-Chief, New York Hospital, New York, New York.
Immunization; Introduction to Viral Diseases; Influenza; Herpes Simplex Virus Infections

DOUGLAS A. DROSSMAN, M.D.

Associate Professor of Medicine and Psychiatry, University of North Carolina at Chapel Hill School of Medicine. Attending Physician, North Carolina Memorial Hospital, Chapel Hill, North Carolina.
The Eating Disorders

DAVID J. DRUTZ, M.D.

Adjunct Professor of Medicine, University of Pennsylvania School of Medicine. Vice-President, Biological Sciences, Smith Kline & French Laboratories, Philadelphia, Pennsylvania.
Actinomycosis; Nocardiosis; The Mycoses

DAVID T. DURACK, M.B., D.Phil.

Professor of Medicine, Microbiology and Immunology, Duke University School of Medicine. Chief, Division of Infectious Diseases, Duke University Medical Center, Durham, North Carolina.
Pneumococcal Pneumonia; Infective Endocarditis

THEODORE C. EICKHOFF, M.D.

Professor of Medicine, University of Colorado School of Medicine. Director of Internal Medicine, Presbyterian-Saint Luke's Medical Center, Denver, Colorado.

Bartonellosis; Trench Fever; Q Fever; Colorado Tick Fever

RONALD J. ELIN, M.D., Ph.D.

Clinical Professor of Pathology, Uniformed Services University of the Health Sciences School of Medicine. Chief, Clinical Chemistry Service and Clinical Pathology Department, Clinical Center, National Institutes of Health, Bethesda, Maryland.

Reference Intervals and Laboratory Values of Clinical Importance

EDWARD A. EMMETT, M.B., M.S.

Professor and Director, Division of Occupational Medicine, Johns Hopkins Medical Institutions. Staff Physician, Johns Hopkins Hospital; Consulting Physician, Wyman Park Medical Center, Baltimore, Maryland.

Occupational Diseases of the Skin

ANDREW G. ENGEL, M.D.

William L. McKnight-3M Professor of Neuroscience, Mayo Medical School. Attending Physician, St. Mary's Hospital and Rochester Methodist Hospital, Rochester, Minnesota.

Diseases of Muscle and Neuromuscular Junction

JEROME ENGEL, Jr., M.D., Ph.D.

Professor of Neurology and Anatomy, University of California, Los Angeles, UCLA School of Medicine. Attending Neurologist and Chief of Clinical Neurophysiology Laboratories, UCLA Center for Health Sciences and UCLA Neuropsychiatric Institute, Los Angeles, California.

The Epilepsies

STANLEY FAHN, M.D.

H. Houston Merritt Professor of Neurology, Columbia University College of Physicians and Surgeons. Attending Neurologist, Neurological Institute of New York and Presbyterian Hospital in the City of New York, New York, New York.

The Extrapyramidal Disorders

DOUGLAS V. FALLER, Ph.D., M.D.

Assistant Professor. Harvard Medical School. Assistant Physician, Dana Farber Cancer Institute; Assistant in Medicine, Children's Hospital, Boston, Massachusetts.

Diseases of the Spleen

BARRY L. FANBURG, M.D.

Professor of Medicine, Tufts University School of Medicine. Chief of Pulmonary Division, Department of Medicine, New England Medical Center, Boston, Massachusetts.

Sarcoidosis

ANTHONY S. FAUCI, M.D.

Director, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland.

Glucocorticosteroid Therapy

DOUGLAS T. FEARON, M.D.

Professor of Medicine and of Molecular Biology and Genetics, Johns Hopkins University School of Medicine. Director, Division of Molecular and Clinical Rheumatology, Johns Hopkins Hospital, Baltimore, Maryland.

Complement

MARK FELDMAN, M.D.

Professor, Department of Internal Medicine, University of Texas Health Science Center at Dallas. Associate Chief of Staff for Research and Development, Veterans Administration Medical Center, Dallas, Texas.

Peptic Ulcer: Complications

PHILIP J. FIALKOW, M.D.

Professor and Chairman, Department of Medicine, University of Washington School of Medicine. Physician-in-Chief, University Hospital; Attending Physician, Harborview Medical Center, Seattle, Washington.

Clonal Development and Stem Cell Origin of Proliferative Disorders

DANIEL B. FISHBEIN, M.D.

Medical Epidemiologist, Viral and Rickettsial Zoonoses Branch, Centers for Disease Control, Atlanta, Georgia.

Rabies

ALFRED P. FISHMAN, M.D.

William Maul Measey Professor of Medicine, University of Pennsylvania School of Medicine. Attending Physician, Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania.

Pulmonary Hypertension

GARRETT A. FITZGERALD, M.D.

Professor of Medicine and of Pharmacology, Vanderbilt University School of Medicine. Attending Physician, Department of Medicine and S.C.O.R. in Hypertension, Vanderbilt University Medical Center, Nashville, Tennessee.

Prostaglandins and Related Compounds

KATHLEEN M. FOLEY, M.D.

Associate Professor of Neurology and Pharmacology, Cornell University Medical College. Associate Attending Neurologist and Chief, Pain Service, Memorial Sloan-Kettering Cancer Center, New York, New York.

Pain and Its Management

BERNARD G. FORGET, M.D.

Professor of Medicine and Human Genetics; Chief of Hematology Section, Department of Medicine, Yale University School of Medicine. Attending Physician, Yale-New Haven Hospital, New Haven, Connecticut.

Sickle Cell Anemia and Associated Hemoglobinopathies

DAVID W. FRASER, M.D.

President, Swarthmore College, Swarthmore, Pennsylvania. Adjunct Professor of Medicine, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania.

Legionellosis

F. CLARKE FRASER, Ph.D., M.D.

Professor of Clinical Genetics, Departments of Biology and Pediatrics and the McGill Centre for Human Genetics, McGill University Faculty of Medicine. Medical Geneticist, Montreal Children's Hospital, Montreal, Quebec, Canada.

Genetic Counseling

JOSEPH F. FRAUMENI, Jr., M.D.

Associate Director for Epidemiology and Biostatistics, National Cancer Institute, National Institutes of Health. Adjunct Professor of Epidemiology, Department of Preventive Medicine and Biometrics, Uniformed Services University of the Health Sciences School of Medicine, Bethesda, Maryland.

Epidemiology of Cancer

WILLIAM T. FRIEDEWALD, M.D.

Associate Director for Disease Prevention, National Institutes of Health, Bethesda, Maryland.

Epidemiology of Cardiovascular Disease

GARY D. FRIEDMAN, M.D., M.S.

Assistant Director for Epidemiology and Biostatistics, Division of Research, Kaiser Permanente Medical Care Program, Oakland, California. Associate Clinical Professor of Medicine and of Family and Community Medicine, University of California, San Francisco, School of Medicine, San Francisco; Lecturer in Epidemiology, School of Public Health, University of California, Berkeley, California.

The Preventive Health Examination

JAMES F. FRIES, M.D.

Associate Professor of Medicine, Stanford University School of Medicine, Stanford, California.

Approach to the Patient with Musculoskeletal Disease

LAWRENCE A. FROHMAN, M.D.

Professor of Medicine, University of Cincinnati College of Medicine. Director, Division of Endocrinology and Metabolism, and Director, General Clinical Research Center, University of Cincinnati Medical Center, Cincinnati, Ohio.

Neuroendocrine Regulation and Its Disorders; The Anterior Pituitary

PATRICIA A. GABOW, M.D.

Associate Professor of Medicine, University of Colorado School of Medicine; Director, Medical Services, Denver General Hospital, Denver, Colorado.

Cystic Disease of the Kidney

ROBERT C. GALLO, M.D.

Chief, Laboratory of Tumor Cell Biology, National Cancer Institute, National Institutes of Health, Bethesda, Maryland.

Retroviruses That Cause Human Disease

JEFFREY A. GELFAND, M.D.

Associate Professor, Division of Geographic Medicine and Infectious Diseases, Department of Medicine, Tufts University School of Medicine. Physician, New England Medical Center Hospital, Boston, Massachusetts.

Advice to Travelers

JOHN W. GITTINGER, Jr., M.D.

Professor of Surgery and Neurology and Chairman, Division of Ophthalmology, University of Massachusetts Medical School. Chief of Ophthalmology, University of Massachusetts Medical Center, Worcester, Massachusetts.

Eye Diseases

JOHN H. GLICK, M.D.

Professor of Medicine, University of Pennsylvania School of Medicine; Director, University of Pennsylvania Cancer Center. Attending Physician, Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania.

Hodgkin's Disease

SHERWOOD L. GORBACH, M.D.

Professor of Medicine and Community Health, Tufts University School of Medicine. Attending Physician, New England Medical Center Hospital, Boston, Massachusetts.

Diseases Caused by Non-Spore-Forming Anaerobic Bacteria

JARED J. GRANTHAM, M.D.

Professor of Medicine and Director, Nephrology Division, University of Kansas College of Health Sciences and Hospital School of Medicine, Kansas City, Kansas.

Acute Renal Failure

BRUCE M. GREENE, M.D.

Associate Professor of Medicine, Case Western Reserve University School of Medicine. Associate Chief, Division of Geographic Medicine, University Hospitals of Cleveland, Cleveland, Ohio.

Onchocerciasis

JOSEPH C. GREENFIELD, M.D.

James B. Duke Professor and Chairman, Department of Medicine, Duke University School of Medicine. Chief, Division of Cardiology, Duke University Medical Center, Durham, North Carolina.

Electrocardiography

JAMES H. GRENDALL, M.D.

Assistant Professor of Medicine and Physiology, University of California, San Francisco, School of Medicine. Attending Physician, San Francisco General Hospital Medical Center, San Francisco, California.

Vascular Diseases of the Intestine

JEROME E. GROOPMAN, M.D.

Associate Professor of Medicine, Harvard Medical School. Attending Physician and Chief of Hematology/Oncology, Department of Medicine, New England Deaconess Hospital, Boston, Massachusetts.

Langerhans Cell Granulomatosis; The Acquired Immunodeficiency Syndrome

CARL GRUNFELD, M.D., Ph.D.

Associate Professor of Medicine, University of California, San Francisco, School of Medicine. Co-Director, Special Diagnostic and Treatment Unit, Veterans Administration Medical Center, San Francisco, California.

Pancreatic Islet Cell Tumors

RICHARD L. GUERRANT, M.D.

Professor of Medicine and Head, Division of Geographic Medicine, University of Virginia School of Medicine. Attending Physician, University of Virginia Hospital, Charlottesville, Virginia.

Campylobacter Enteritis; Enteric Escherichia coli Infections

JOHN L. HAMERTON, D.Sc.

Professor of Human Genetics and Pediatrics, University of Manitoba Faculty of Medicine. Scientific Staff, Health Sciences Centre and St. Boniface General Hospital, Winnipeg, Manitoba, Canada.

Chromosomes and Their Disorders

DONALD H. HARTER, M.D.

Benjamin and Virginia T. Boshes Professor of Neurology, Northwestern University Medical School. Attending Neurologist, Northwestern Memorial Hospital, Chicago, Illinois.

Parameningeal Infections

WILLIAM L. HASKELL, Ph.D.

Associate Professor of Medicine, Stanford University School of Medicine, Stanford, California.

Exercise and Health

BARTON F. HAYNES, M.D.

Professor of Medicine and Chief, Division of Rheumatology and Immunology, Duke University School of Medicine, Durham, North Carolina.

Wegener's Granulomatosis and Midline Granuloma

JOHN P. HAYSLETT, M.D.

Professor of Medicine and Chief, Section of Nephrology, Yale University School of Medicine. Attending Physician, Yale-New Haven Hospital, New Haven, Connecticut.

Renal Disease in Pregnancy

LOUIS A. HEALEY, M.D.

Clinical Professor of Medicine, University of Washington School of Medicine. Attending Physician, Virginia Mason Hospital, Seattle, Washington.

Polymyalgia Rheumatica and Giant Cell Arteritis

BERNADINE P. HEALY, M.D.

Chairman, Research Institute, Cleveland Clinic Foundation, Cleveland, Ohio.

Miscellaneous Conditions of the Heart: Tumor, Trauma, and Systemic Disease

DONALD A. HENDERSON, M.D., M.P.H.

Dean and Professor of Epidemiology and International Health, Johns Hopkins School of Hygiene and Public Health, Baltimore, Maryland.

Variola and Vaccinia

ERIK L. HEWLETT, M.D.

Professor of Medicine and Pharmacology and Head, Division of Clinical Pharmacology, University of Virginia School of Medicine. Attending Physician, University of Virginia Hospital, Charlottesville, Virginia.

Diphtheria

J. ALLAN HOBSON, M.D.

Professor of Psychiatry, Harvard Medical School. Principal Psychiatrist, Massachusetts Mental Health Center, Boston, Massachusetts.

Sleep and Its Disorders

EDWARD W. HOLMES, M.D.

Professor of Medicine and Associate Professor of Biochemistry, Duke University School of Medicine. Chief of Metabolism, Endocrinology, and Genetics, Department of Medicine, Duke University Hospital, Durham, North Carolina.

Disorders of Purine Metabolism

LEWIS B. HOLMES, M.D.

Associate Professor of Pediatrics, Harvard Medical School. Pediatrician and Chief, Embryology-Teratology Unit, Massachusetts General Hospital, Boston, Massachusetts.

Congenital Malformations

PHILIP C. HOPEWELL, M.D.

Professor of Medicine, University of California, San Francisco, School of Medicine. Associate Chief of Medical Service, San Francisco General Hospital Medical Center, San Francisco, California.

Critical Care Medicine

DONALD R. HOPKINS, M.D., M.P.H.

Deputy Director, Centers for Disease Control, Atlanta, Georgia.

Dracunculiasis

RICHARD B. HORNICK, M.D.

Professor of Medicine, University of Rochester School of Medicine and Dentistry. Attending Physician, Strong Memorial Hospital, Rochester, New York.

Salmonella Infections Other Than Typhoid Fever; Tularemia; Introduction to Rickettsial Diseases; The Typhus Group; Rocky Mountain Spotted Fever; Other Tick-Borne Rickettsioses; Rickettsialpox; Scrub Typhus

DONALD W. HOSKINS, M.D.

Clinical Associate Professor of Medicine, Divisions of International Medicine and Digestive Diseases, Department of Medicine, Cornell University Medical College. Vice-President of Medical Affairs and Attending Physician in Medicine, Doctors Hospital; Associate Attending Physician, New York Hospital, New York, New York.

Trichinellosis

DAVID S. HOWELL, M.D.

Professor of Medicine and Director of Arthritis Division, Department of Medicine, University of Miami School of Medicine; Medical Investigator, Veterans Administration Medical Center. Attending Physician, James M. Jackson Memorial Hospital, Miami, Florida.

Osteoarthritis; The Painful Shoulder; The Painful Back

R. RODNEY HOWELL, M.D.

David R. Park Professor and Chairman, Department of Pediatrics, University of Texas Health Science Center at Houston. Pediatrician-in-Chief, University Children's Hospital at Hermann; Consultant in Pediatrics, M. D. Anderson Hospital and Tumor Institute; Consultant in Pediatrics, Shriners Hospital for Crippled Children, Houston, Texas.

The Glycogen Storage Diseases; Pentosuria; Essential Fructosuria and Hereditary Fructose Intolerance

STEPHEN B. HULLEY, M.D., M.P.H.

Professor of Epidemiology, Medicine and Health Policy, University of California, San Francisco, School of Medicine. Director, Clinical Epidemiology Program, San Francisco General Hospital Medical Center, San Francisco, California.

Principles of Preventive Medicine; Control of Unintended Injuries and Those Due to Violence

JULIANNE IMPERATO-McGINLEY, M.D.

Associate Professor of Internal Medicine, Cornell University Medical College. Associate Attending Physician, New York Hospital, New York, New York.

Disorders of Sexual Differentiation

WALDEMAR G. JOHANSON, Jr., M.D.

Professor and Chairman, Department of Internal Medicine, University of Texas Medical School at Galveston. Full-time Active Staff Physician, University of Texas Medical Branch Hospitals, Galveston, Texas.

Introduction to Pneumonia; Pneumonia Caused by Aerobic Gram-Negative Bacilli; Recurrent Aspiration Pneumonia

KENNETH P. JOHNSON, M.D.

Professor and Chairman, Department of Neurology, University of Maryland School of Medicine. Attending Neurologist, University of Maryland Hospital, Kernan Hospital for Crippled Children, and Mercy Hospital; Staff Neurologist, Veterans Administration Medical Center, Baltimore, Maryland.

Syphilitic Infections of the Central Nervous System

ALBERT R. JONSEN, Ph.D.

Professor of Ethics in Medicine and Chief, Division of Medical Ethics, Department of Medicine, University of California, San Francisco, School of Medicine, San Francisco, California.

Ethics in the Practice of Medicine

JOHN P. KANE, M.D., Ph.D.

Professor of Medicine and of Biochemistry and Biophysics, University of California, San Francisco, School of Medicine. Attending Physician, University of California Hospitals, San Francisco, California.

The Judicious Diet

ALBERT Z. KAPIKIAN, M.D.

Head, Epidemiology Section, Laboratory of Infectious Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland.

The Common Cold; Viral Gastroenteritis

MANUEL E. KAPLAN, M.D.

Professor of Medicine, University of Minnesota Medical School. Chief of Hematology/Oncology, Veterans Administration Medical Center, Minneapolis, Minnesota.

Hemolytic Disorders: Introduction; Acquired Hemolytic Disorders

SAMUEL KAPLAN, M.D.

Professor of Pediatrics and of Medicine, University of Cincinnati College of Medicine. Director, Division of Cardiology, Children's Hospital Medical Center, Cincinnati, Ohio.

Congenital Heart Disease

SAMUEL L. KATZ, M.D.

Wilbert Cornell Davison Professor and Chairman, Department of Pediatrics, Duke University School of Medicine, Durham, North Carolina.

Whooping Cough; Measles; Rubella

ALAN S. KEITT, M.D.

Associate Professor of Pathology and Medicine, University of Florida College of Medicine. Director, Hematology Laboratories, Shands Teaching Hospital, Gainesville, Florida.

Introduction to the Anemias; Anemia Due to Bone Marrow Failure

ELLIOTT KIEFF, M.D., Ph.D.

Block Professor of Medicine and Molecular Genetics, University of Chicago Division of Biological Sciences Pritzker School of Medicine. Chief, Section on Infectious Diseases, University of Chicago Hospital, Chicago, Illinois.

Infectious Mononucleosis: Epstein-Barr Virus Infection

BENJAMIN KISSIN, M.D.

Professor Emeritus in Psychiatry, State University of New York Health Sciences Center at Brooklyn, Brooklyn, New York.

Alcohol Abuse and Alcohol-Related Illnesses

SAULO KLAHR, M.D.

Joseph Friedman Professor of Renal Disease and Director, Renal Division, Washington University School of Medicine. Physician, Barnes Hospital; Staff Physician and Consultant in Nephrology, Jewish Hospital of St. Louis, St. Louis, Missouri.

Structure and Function of the Kidneys

JAMES P. KNOCHEL, M.D.

Vice-Chairman and Professor of Internal Medicine, University of Texas Health Science Center at Dallas. Chief, Medical Service, Veterans Administration Medical Center; Senior Attending Physician, Parkland Memorial Hospital, Dallas, Texas.

Disorders Due to Heat and Cold

JUHA P. KOKKO, M.D., Ph.D.

Professor and Chairman, Department of Medicine, Emory University School of Medicine. Chief of Medicine, Emory University Hospital and Grady Memorial Hospital, Atlanta, Georgia.

Chronic Renal Failure

EDWIN H. KOLODNY, M.D.

Professor of Neurology, Harvard Medical School, Boston. Associate Neurologist, Massachusetts General Hospital, Boston; Consultant in Neurology, McLean Hospital, Belmont, Massachusetts.

Gaucher's Disease; Niemann-Pick Disease

HERMES A. KONTOS, M.D., Ph.D.

Professor of Medicine; Chairman, Division of Cardiology; and Vice-Chairman, Department of Medicine, Virginia Commonwealth University Medical College of Virginia School of Medicine, Richmond, Virginia.

Vascular Diseases of the Limbs

STEPHEN M. KRANE, M.D.

Professor of Medicine, Harvard Medical School. Chief of Arthritis Unit, Massachusetts General Hospital, Boston, Massachusetts.

Connective Tissue Structure and Function

RICHARD M. KRAUSE, M.D.

Dean and Robert W. Woodruff Professor of Medicine, Emory University School of Medicine, Atlanta, Georgia.

Streptococcal Diseases

GUENTER J. KREJS, M.D.

Professor and Chairman, Department of Medicine, Karl-Franzens-Universität, Graz, Austria.

Diarrhea

WILLIAM L. KRINSKY, M.D., Ph.D.

Associate Professor of Epidemiology, Section of Medical Entomology, Yale University School of Medicine, New Haven, Connecticut.

Arthropods and Leeches

DONALD J. KROGSTAD, M.D.

Associate Professor of Medicine and Pathology, Washington University School of Medicine. Co-Director, Microbiology and Serology Laboratories, Barnes Hospital; Assistant Physician, Barnes Hospital and Jewish Hospital of St. Louis, St. Louis, Missouri.

Amebiasis

JAMES P. KUSHNER, M.D.

Professor of Medicine and Chief, Division of Hematology-Oncology, University of Utah School of Medicine. Attending Physician, University of Utah Hospital and Veterans Administration Medical Center, Salt Lake City, Utah.

Normochromic Normocytic Anemias; Hypochromic Anemias

SYLVIA A. LACK, M.D.

Director, Chronic Pain Program, Gaylord Hospital, Wallingford. Attending Physician, Gaylord Hospital, Wallingford; World War II Memorial Hospital, Meriden; and Veterans Administration Medical Center, Newington; Consultant in Hospice Care, St. Mary's Hospital, Waterbury, Connecticut.

Care of Dying Patients and Their Families

DAVID J. LANG, M.D.

Professor of Pediatrics, University of Southern California School of Medicine, Los Angeles. Pediatrician-in-Chief and Director of Infectious Diseases, Children's Hospital of Orange County, Orange, California.

Cytomegalovirus Infection

P. REED LARSEN, M.D.

Professor of Medicine, Harvard Medical School. Senior Physician and Director, Thyroid Unit, Brigham and Women's Hospital; Investigator, Howard Hughes Medical Institute, Boston, Massachusetts.

The Thyroid

JOHN LASZLO, M.D.

Professor of Medicine (on leave), Duke University School of Medicine, Durham, North Carolina. Vice-President for Research, American Cancer Society, New York, New York.

Oncology: Introduction

ROBERT B. LAYZER, M.D.

Professor of Neurology, University of California, San Francisco, School of Medicine. Attending Neurologist, University of California, San Francisco, Hospitals and Clinics, San Francisco, California.

Degenerative Diseases of the Nervous System

GERALD M. LAZARUS, M.D.

Milton B. Hartzell Professor and Chairman, Department of Dermatology, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania.

Panniculitis and Disorders of the Subcutaneous Fat

ROBERT J. LEFKOWITZ, M.D.

James B. Duke Professor of Medicine, Duke University School of Medicine, Durham, North Carolina.

Pharmacologic Principles Related to the Autonomic Nervous System

E. CARWILE LeROY, M.D.

Professor of Medicine, Medical University of South Carolina College of Medicine. Attending Physician, Medical University Hospital, Charleston Memorial Hospital, and Veterans Administration Medical Center, Charleston, South Carolina.

Systemic Sclerosis

BERNARD LEVIN, M.D.

Professor of Medicine, University of Texas Health Science Center at Houston. Attending Physician, M. D. Anderson Hospital and Tumor Institute, Houston, Texas.

Ulcerative Colitis

MICHAEL D. LEVITT, M.D.

Professor of Medicine, University of Minnesota Medical School. Attending Gastroenterologist and Associate Chief of Staff for Research, Veterans Administration Medical Center, Minneapolis, Minnesota.

Pancreatitis

BRIAN J. LEWIS, M.D.

Clinical Professor of Medicine, University of California, San Francisco, School of Medicine. Attending Physician, Cancer Research Institute, University of California, San Francisco, Hospitals and Clinics, San Francisco, California.

Breast Cancer

ROBERT A. LEWIS, M.D.

Associate Professor, Syntex Research, 3401 Hillview Avenue, Palo Alto, California 94304

Mastocytosis

LAWRENCE M. LICHTENSTEIN, M.D.

Professor of Medicine, Johns Hopkins University School of Medicine. Staff Physician, Good Samaritan Hospital, Baltimore, Maryland.

Anaphylaxis; Insect Sting Allergy

IRIS F. LITT, M.D.

Associate Professor, Department of Pediatrics, Stanford University School of Medicine. Director, Division of Adolescent Medicine, Stanford University Hospital and Children's Hospital at Stanford, Stanford, California.

Adolescent Medicine

JOHN N. LOEB, M.D.

Professor of Medicine, Columbia University College of Physicians and Surgeons. Attending Physician, Presbyterian Hospital in the City of New York, New York, New York.

Polyglandular Disorders

D. LYNN LORIAUX, M.D., Ph.D.

Clinical Director, National Institute of Child Health and Human Development, National Institutes of Health, Bethesda, Maryland.

Hirsutism

DONALD B. LOURIA, M.D.

Professor and Chairman, Department of Preventive Medicine and Community Health, University of Medicine and Dentistry of New Jersey-New Jersey Medical School, Newark, New Jersey.

Trace Metal Poisoning

ROBERT G. LUKE, M.B., Ch.B.

Professor of Medicine, University of Alabama School of Medicine. Director of Nephrology Division, University of Alabama Hospitals, Birmingham, Alabama.

Dialysis

SAMUEL E. LUX, M.D.

Professor of Pediatrics, Harvard Medical School. Chief, Division of Hematology-Oncology, Children's Hospital, Boston, Massachusetts.

Hereditary Defects in the Membrane or Metabolism of the Red Cell

ADEL A. F. MAHMOUD, M.D., Ph.D.

Professor of Medicine and of Molecular Biology and Microbiology, Case Western Reserve University School of Medicine. Attending Physician, University Hospitals of Cleveland, Cleveland, Ohio.

Introduction to Protozoan and Helminthic Diseases; Schistosomiasis

STEPHEN E. MALAWISTA, M.D.

Professor of Medicine and Chief, Section of Rheumatology, Department of Internal Medicine, Yale University School of Medicine. Attending Physician, Yale-New Haven Hospital, New Haven, and Veterans Administration Medical Center, West Haven, Connecticut.

Lyme Disease; Infectious Arthritis

PETER F. MALET, M.D.

Assistant Professor of Medicine, University of Pennsylvania School of Medicine. Attending Physician, Gastrointestinal Section, Department of Medicine, Hospital of the University of Pennsylvania and Veterans Administration Medical Center, Philadelphia, Pennsylvania.

Diseases of the Gallbladder and Bile Ducts

HENRY J. MANKIN, M.D.

Edith M. Ashley Professor of Orthopaedics, Harvard Medical School. Chief of Orthopaedic Service, Massachusetts General Hospital, Boston, Massachusetts.

Bone Tumors

AARON J. MARCUS, M.D.

Professor of Medicine, Cornell University Medical College. Chief, Hematology-Oncology, and Attending Physician, Veterans Administration Medical Center; Attending Physician, New York Hospital, New York, New York.

Hemorrhagic Disorders: Abnormalities of Platelet and Vascular Function

ANDREW M. MARGILETH, M.D.

Professor of Pediatrics, Uniformed Services University of the Health Sciences School of Medicine, Bethesda. Consultant in Pediatrics, Walter Reed Army Medical Center, Washington, D.C.; Bethesda Naval Hospital, Bethesda; and Malcolm Grow U.S. Air Force Medical Center, Camp Springs, Maryland.

Cat Scratch Disease

ALEXANDER R. MARGULIS, M.D.

Professor and Chairman, Department of Radiology, University of California, San Francisco, School of Medicine. Chief of Radiology, University of California, San Francisco, Hospitals and Clinics, San Francisco, California.

Overview of Imaging Techniques and Projection for the Future

HENRY MASUR, M.D.

Professor of Clinical Medicine, George Washington University School of Medicine and Health Sciences, Washington, D.C. Deputy Chief, Critical Care Medicine Department, Clinical Center, National Institutes of Health, Bethesda, Maryland.

Toxoplasmosis; Pneumocystosis

ALVIN M. MATSUMOTO, M.D.

Assistant Professor of Medicine, University of Washington School of Medicine. Attending Physician, Division of Gerontology and Geriatric Medicine, Geriatric Research, Education, and Clinical Center, Veterans Administration Medical Center, Seattle, Washington.

The Testis

RICHARD A. MATTHAY, M.D.

Professor of Medicine and Associate Director, Pulmonary Section, Department of Internal Medicine, Yale University School of Medicine. Associate Director, Winchester Chest Clinic; Co-Director, Medical Intensive Care Unit; and Attending Pulmonologist, Yale-New Haven Hospital, New Haven, Connecticut.

Chronic Airways Diseases; Abnormalities of Lung Aeration

J. BRUCE McCLAIN, M.D.

Associate Professor of Medicine, Uniformed Services University of the Health Sciences School of Medicine, Bethesda, Maryland. Chief, Infectious Disease Service, Walter Reed Army Medical Center, Washington, D.C.

Rat-Bite Fevers; Leptospirosis

T. DWIGHT McKINNEY, M.D.

Professor of Medicine, University of Texas Health Science Center at San Antonio. Attending Physician, Medical Center Hospital and Audie L. Murphy Memorial Veterans Hospital, San Antonio, Texas.

Tubulointerstitial Diseases and Toxic Nephropathies

IRENE MEISSNER, M.D.

Assistant Professor of Neurology, University of Western Ontario. Staff Physician, Clinical Neurological Sciences, University Hospital, London, Ontario, Canada.

Introduction to Cerebrovascular Diseases

RONALD P. MESSNER, M.D.

Professor of Medicine and Director, Section of Rheumatology, University of Minnesota. Attending Physician, University of Minnesota Hospital and Clinics, Veterans Administration Medical Center, and Hennepin County Medical Center, Minneapolis, Minnesota.

Polymyositis

LOUIS H. MILLER, M.D.

Head, Malaria Section, Laboratory of Parasitic Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland.

Malaria

THOMAS P. MONATH, M.D.

Director, Division of Vector-Borne Viral Diseases, Center for Infectious Diseases, Centers for Disease Control, Public Health Service, Department of Health and Human Services, Ft. Collins, Colorado.

Arthropod-Borne Viral Encephalitides

WILLIAM L. MORGAN, M.D.

Professor of Medicine, University of Rochester School of Medicine and Dentistry. Associate Chairman, Department of Medicine, Strong Memorial Hospital, Rochester, New York.

Clinical Approach to the Patient

DEANE F. MOSHER, M.D.

Professor of Medicine and Physiological Chemistry and Head, Section of Hematology, University of Wisconsin Medical School, Madison, Wisconsin.

Disorders of Blood Coagulation

ARNO G. MOTULSKY, M.D., D.Sc.

Professor of Medicine and Genetics, University of Washington School of Medicine. Attending Physician, University Hospital and Providence Medical Center, Seattle, Washington.

Hemochromatosis; Hereditary Syndromes Involving Multiple Organ Systems

S. HARVEY MUDD, M.D.

Chief, Section on Alkaloid Biosynthesis, Laboratory of General and Comparative Biochemistry, National Institute of Mental Health, Bethesda, Maryland.

Homocystinuria

MAURICE A. MUFSON, M.D.

Professor of Microbiology and Chairman, Department of Medicine, Marshall University School of Medicine. Associate Chief of Staff for Research, Veterans Administration Medical Center; Staff Physician, Cabell Huntington Hospital and St. Mary's Hospital, Huntington, West Virginia.

Viral Pharyngitis, Laryngitis, Croup, and Bronchitis

JOHN F. MURRAY, M.D.

Professor of Medicine, University of California, San Francisco, School of Medicine. Chief of the Chest Service, San Francisco General Hospital Medical Center, San Francisco, California.

Respiratory Diseases: Introduction; Respiratory Structure and Function; Respiratory Failure

BRYAN D. MYERS, M.B.

Professor of Medicine, Stanford University School of Medicine. Acting Chief, Division of Nephrology, Stanford University Hospital, Stanford, California.

Diabetes and the Kidney

DAVID G. NATHAN, M.D.

Robert G. Stranahan Professor of Pediatrics, Harvard Medical School. Physician-in-Chief, Children's Hospital, Boston, Massachusetts.

Introduction to Hematologic Diseases

PHILIP NEEDLEMAN, Ph.D.

Professor and Head, Department of Pharmacology, Washington University School of Medicine, St. Louis, Missouri.

Natriuretic Factors

FRANKLIN A. NEVA, M.D.

Chief, Laboratory of Parasitic Diseases; Member, Section on Clinical Parasitology, Laboratory of Clinical Investigation, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland.

American Trypanosomiasis; Leishmaniasis

CHRISTOPHER J. L. NEWTH, M.B.

Associate Professor of Pediatrics, University of Southern California School of Medicine. Director, Pediatric Intensive Care, Children's Hospital of Los Angeles, Los Angeles, California.

Bronchiectasis; Cystic Fibrosis

ARTHUR W. NIENHUIS, M.D.

Deputy Clinical Director and Chief, Clinical Hematology Branch, National Heart, Lung and Blood Institute, National Institutes of Health, Bethesda, Maryland.

Hemoglobin Synthesis; The Thalassemias

ALAN S. NIES, M.D.

Professor of Medicine and Pharmacology, University of Colorado School of Medicine. Attending Physician, University Hospital, Denver, Colorado.

Principles of Drug Therapy; Interactions Between Drugs; Adverse Reactions to Drugs

CHARLES P. O'BRIEN, M.D., Ph.D.

Professor of Psychiatry, University of Pennsylvania School of Medicine. Chief, Psychiatry Service, Veterans Administration Medical Center, Philadelphia, Pennsylvania.

Drug Abuse and Dependence

ROBERT K. OCKNER, M.D.

Professor of Medicine and Director of Liver Center, University of California, San Francisco, School of Medicine. Chief of Gastroenterology, Moffitt-Long Hospitals, San Francisco, California.

Clinical Approach to Liver Disease; Hepatic Metabolism in Liver Disease; Laboratory Tests in Liver Disease; Approaches to the Diagnosis of Jaundice; Acute Viral Hepatitis; Toxic and Drug-Induced Liver Disease; Chronic Hepatitis

WILLIAM D. ODELL, M.D., Ph.D.

Chairman, Department of Internal Medicine, and Professor of Medicine and Physiology, University of Utah School of Medicine, Salt Lake City, Utah.

Endocrine Manifestations of Tumors: "Ectopic" Hormone Production

JERROLD M. OLEFSKY, M.D.

Professor of Medicine, University of California, San Diego, School of Medicine. Staff, Medical Research Services, Veterans Administration Medical Center, La Jolla, California.

Diabetes Mellitus

SUZANNE OPARIL, M.D.

Professor of Medicine and Associate Professor of Physiology and Biophysics, University of Alabama School of Medicine. Attending Cardiologist, University Hospital, Birmingham, Alabama.

Arterial Hypertension

ERIC A. OTTESEN, M.D.

Staff Physician, Clinical Center, National Institutes of Health, Bethesda, Maryland, and Children's Hospital National Medical Center, Washington, D.C.

Filariasis

CHARLES Y. C. PAK, M.D.

Professor of Internal Medicine, University of Texas Health Science Center at Dallas, Dallas, Texas.

Renal Calculi

FRANK PARKER, M.D.

Professor and Chairman, Department of Dermatology, Oregon Health Sciences University School of Medicine. Staff Physician, Oregon Health Sciences University Teaching Hospital and Veterans Administration Medical Center, Portland, Oregon.

Cutaneous Manifestations of Internal Malignancy; Skin Diseases

STEPHEN G. PAUKER, M.D.

Professor of Medicine and Chief, Division of Medical Information Sciences, Department of Medicine, Tufts University School of Medicine. Chief, Division of Clinical Decision Making, Department of Medicine, New England Medical Center, Boston, Massachusetts.

Clinical Decision Making

WILLIAM E. PAUL, M.D.

Chief, Laboratory of Immunology, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland.

The Immune System: Introduction

HERBERT A. PERKINS, M.D.

Clinical Professor of Medicine, University of California, San Francisco, School of Medicine. Scientific Director, Irwin Memorial Blood Bank, San Francisco, California.

Blood Transfusion

JOSEPH K. PERLOFF, M.D.

Streisand/American Heart Association Professor of Medicine and Pediatrics, University of California, Los Angeles, UCLA School of Medicine, Los Angeles, California.

Diseases of the Myocardium

WALTER L. PETERSON, M.D.

Associate Professor of Medicine, University of Texas Health Science Center at Dallas. Chief, Gastroenterology Section, Veterans Administration Medical Center, Dallas, Texas.

Peptic Ulcer: Medical Therapy; Gastrointestinal Hemorrhage

SIDNEY PHILLIPS, M.D.

Professor of Medicine, Mayo Medical School. Director, Gastroenterology Unit, and Consultant in Gastroenterology, Mayo Clinic, Rochester, Minnesota.

Disorders of Gastrointestinal Motility

THEODORE L. PHILLIPS, M.D.

Professor and Chairman, Department of Radiation Oncology, University of California, San Francisco, School of Medicine. Consulting Physician, University of California, San Francisco, Hospitals and Clinics, Veterans Administration Medical Center, and Mt. Zion Hospital and Medical Center, San Francisco, California.

Radiation Injury

NATHANIEL F. PIERCE, M.D.

Professor of Medicine, Johns Hopkins University School of Medicine; Professor of International Health, Johns Hopkins University School of Hygiene and Public Health, Baltimore, Maryland. Research Coordinator, Global Diarrhoeal Diseases Control Programme, World Health Organization, Geneva, Switzerland.

Cholera

F. XAVIER PI-SUNYER, M.D.

Professor of Clinical Medicine, Columbia University College of Physicians and Surgeons. Director, Division of Endocrinology and Metabolism, and Associate Director, Obesity Research Center, St. Luke's-Roosevelt Hospital Center, New York, New York.

Obesity

FRED PLUM, M.D.

Anne Parrish Titzell Professor and Chairman, Department of Neurology, Cornell University Medical College. Neurologist-in-Chief, New York Hospital-Cornell Medical Center, New York, New York.

Approach to the Neurologic Patient; Disorders of Consciousness and Arousal; The Dementias; Autonomic Disorders and Their Management; Disorders of Motor Function

CHARLES E. POPE II, M.D.

Professor of Medicine, University of Washington School of Medicine. Chief of Gastroenterology, Veterans Administration Medical Center, Seattle, Washington.

Diseases of the Esophagus

RICHARD L. POPP, M.D.

Professor of Medicine and Associate Chairman, Department of Medicine, Stanford University School of Medicine, Stanford, California.

Echocardiography

CAROL S. PORTLOCK, M.D.

Associate Professor of Medicine, Yale University School of Medicine. Staff Physician, Yale-New Haven Hospital, New Haven, Connecticut.

Introduction to Neoplasms of the Immune System; The Non-Hodgkin's Lymphomas; Burkitt's Lymphoma

JEROME B. POSNER, M.D.

Professor of Neurology, Cornell University Medical College. Attending Neurologist and Chairman, Department of Neurology, Memorial Sloan-Kettering Cancer Center, New York, New York.

Pain and Its Management; Nonmetastatic Effects of Cancer on the Nervous System; Disorders of Consciousness and Arousal; Episodic Loss of Motor Function; Disorders of Sensation; Mechanical Lesions of the Spine and Related Structures

RICHARD W. PRICE, M.D.

Associate Professor of Neurology, Cornell University Medical College. Associate Attending Neurologist, Memorial Hospital and New York

Hospital; Associate Member, Memorial Sloan-Kettering Cancer Center, New York, New York.

Introduction to Viral Infections of the Nervous System; Acute Viral Meningitis and Encephalitis; Herpes Virus Infections of the Nervous System; Poliomyelitis; Slow Virus Infections of the Nervous System

BASIL A. PRUITT, Jr., M.D.

Professor of Surgery, Uniformed Services University of the Health Sciences, Bethesda, Maryland. Commander and Director, U.S. Army Institute of Surgical Research, Fort Sam Houston, Texas.

Electric Injury

CHARLES PUTMAN, M.D.

Dean and Vice-Provost for Research and Development, Duke University School of Medicine. Professor of Medicine and Radiology, Duke University Medical Center, Durham, North Carolina.

Radiography of the Heart

THOMAS C. QUINN, M.D.

Senior Investigator, National Institute of Allergy and Infectious Diseases, National Institutes of Health; Associate Professor of Medicine, Johns Hopkins University School of Medicine. Attending Physician, Clinical Center, National Institutes of Health, Bethesda, and Johns Hopkins Hospital, Baltimore, Maryland.

African Trypanosomiasis

CHARLES E. RACKLEY, M.D.

Anton and Margaret Fuisz Professor of Medicine and Chairman, Department of Medicine, Georgetown University School of Medicine. Physician-in-Chief, Department of Medicine, Georgetown University Hospital, Washington, D.C.

Valvular Heart Disease

SAMUEL RAPOPORT, M.D., Ph.D.

Assistant Professor of Neurology, Cornell University Medical College. Assistant Attending Neurologist, New York Hospital, New York, New York.

Neurologic Diagnostic Procedures

ROBERT W. REBAR, M.D.

Professor, Department of Obstetrics and Gynecology, and Head, Section of Reproductive Endocrinology and Infertility, Northwestern University Medical School. Attending Physician, Northwestern Memorial Hospital, Chicago, Illinois.

The Ovaries

FLOYD C. RECTOR, Jr., M.D.

Professor of Medicine and Physiology, University of California, San Francisco, School of Medicine. Staff Physician, University of California Hospitals and Clinics, San Francisco, California.

Obstructive Nephropathy

CHARLES E. REED, M.D.

Professor of Medicine, Mayo Medical School. Consultant in Internal Medicine and Allergic Diseases, Mayo Clinic and Foundation, Rochester, Minnesota.

Drug Allergy

SEYMOUR REICHLIN, M.D., Ph.D.

Professor of Medicine, Tufts University School of Medicine. Chief, Endocrine Division, New England Medical Center, Boston, Massachusetts.

The Pineal