

ANDREOLI

英文影印版

希氏内科学精要

CECIL Essentials *of* Medicine

第5版 · FIFTH EDITION

CARPENTER

GRIGGS

LOSCALZO

北京医科大学出版社



Health Sciences Asia, Elsevier Science



EDITOR-IN-CHIEF

Thomas E. Andreoli, M.D., M.A.C.P.

Professor and The Nolan Chair
Department of Internal Medicine
University of Arkansas College of Medicine
Little Rock, Arkansas

英文影印版

希氏内科学精要



**CECIL ESSENTIALS
OF MEDICINE** 第 5 版
FIFTH EDITION

EDITORS

Charles C. J. Carpenter, M.D., M.A.C.P.

Professor of Medicine
Director, International Health Institute
Brown University School of Medicine
Providence, Rhode Island

Robert C. Griggs, M.D.

Edward A. and Alma Vollertsen Rykenboer Professor of Neurophysiology
Chair, Department of Neurology
University of Rochester School of Medicine and Dentistry
Rochester, New York

Joseph Loscalzo, M.D., Ph.D.

Wade Professor and Chair
Department of Medicine
Boston University School of Medicine
Physician-in-Chief
Boston Medical Center
Director, Whitaker Cardiovascular Institute
Boston, Massachusetts

北京医科大学出版社

Health Sciences Asia, Elsevier Science

Cecil Essentials of Medicine, 5th edition
Andreoli
ISBN: 0-7216-8179-4
Copyright © 2001 by W. B. Saunders Company. All rights reserved.

Authorized English language reprint edition published by the Proprietor.
Reprint ISBN: 981-4095-47-8

Copyright © 2002 by Health Sciences Asia, Elsevier Science. All rights reserved.
Printed in China by Health Sciences Asia, Elsevier Science under special arrangement with Beijing Medical University Press. This edition is authorized for sale in China only, excluding Hong Kong SAR and Taiwan. Unauthorized export of this edition is a violation of the Copyright Act. Violation of this Law is subject to Civil and Criminal Penalties.

本书英文影印版由 Health Sciences Asia, Elsevier Science 授权北京医科大学出版社在中国大陆境内独家发行。本版仅限在中国境内（不包括香港特别行政区及台湾）出版及标价销售。未经许可之出口，是为违反著作权法，将受法律之制裁。

Health Sciences Asia, Elsevier Science
583 Orchard Road, #09-01 Forum, Singapore 238884
Tel: (65) 737-3593 Fax: (65) 734-1874

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.

本书任何部分之文字及图片，如未获得本公司之书面同意不得用任何方式抄袭、节录或翻印。

北京市版权局著作合同登记号：01-2002-0548

图书在版编目 (CIP) 数据

希氏内科学精要：第 5 版 / (美) 安德里奥利等著. — 影印本.
北京：北京医科大学出版社，2002.4
书名原文：Cecil Essentials of Medicine
ISBN 7-81071-258-6

I. 希… II. 安… III. 内科学—英文 IV. R5

中国版本图书馆 CIP 数据核字 (2002) 第 019331 号

北京医科大学出版社出版
(北京海淀区学院路 38 号北京大学医学部院内 100083)
山东省莱芜市圣龙印务书刊有限责任公司印刷 各地新华书店经销

* * *

开本：880 × 1230mm 1/16 印张：68.5 字数：1920 千字
2002 年 5 月第 1 版 2002 年 5 月山东第 1 次印刷
印数：1-3000 册 定价：139.00 元

影印出版说明

Cecil Essential of Medicine 是国外经典的内科学教科书 *Cecil Textbook of Medicine* (希氏内科学) 的精华本。从 1982 年第一版开始, 每 4 年修订出版一次。第 5 版为 2001 年最新版, 由 T.E. Andreoli 等主编。该书内容系统全面, 秉承了第 4 版以诊断、治疗为核心的特点, 充实了近几年内科领域的主要进展。与第 4 版相比, 新增了分子生物学、循证医学及妇女保健的内容, 有 7 个章节的内容全部改写, 扩充了肿瘤和神经系统疾病的内容, 其余的部分也都做了较大幅度的修订。这对于读者充分认识新世纪生命科学时代, 掌握最新医学前沿新理论、新知识和新技术具有重要的意义。

本书对医学生应该掌握的内科学重点内容进行了系统的列表总结, 便于把握重点内容。用大量的图表替代了冗长的文字叙述, 尤其是大量直观、实用性强的病理生理、诊断、治疗图表的使用为临床诊断与治疗提供了速查依据。这种图文并茂的写作风格使第 5 版的篇幅比上一版减少约 10% 左右。虽然篇幅有所减少, 但仍然涵盖了内科学的核心内容。本书内容通俗易懂, 并且有权威性; 文字流畅, 可读性强; 条理清晰, 方便查阅。对于医学生与各级临床医务工作者, 本书不仅是一本实用的临床指南, 也是他们学习内科学专业知识, 提高其专业外语水平的一本内科学必读教科书。

This edition of *Cecil Essentials of Medicine* is dedicated to two former Editors:

Fred Plum, one of the founding Editors, who recognized the need for a compact textbook of Internal Medicine. Fred brought to *Cecil Essentials of Medicine* clarity in writing and a crisp logic in setting priorities for the content of the text.

J. Claude Bennett, an Editor for the third and fourth editions of this book. Claude brought to *Cecil Essentials of Medicine* his customary incisiveness and ecumenical knowledge of internal medicine.

We thank both of you.

NOTICE

Medicine is an ever-changing field. Standard safety precautions must be followed, but as new research and clinical experience broaden our knowledge, changes in treatment and drug therapy become necessary or appropriate. Readers are advised to check the product information currently provided by the manufacturer of each drug to be administered to verify the recommended dose, the method and duration of administration, and the contraindications. It is the responsibility of the treating physician, relying on experience and knowledge of the patient, to determine dosages and the best treatment for the patient. Neither the Publisher nor the Editors assume any responsibility for any injury and/or damage to persons or property.

THE PUBLISHER



CONTRIBUTORS

Introduction to Molecular Medicine

Joseph Loscalzo, M.D., Ph.D.

Wade Professor and Chair, Department of Medicine, Boston University School of Medicine; Physician-in-Chief, Boston Medical Center; Director, Whitaker Cardiovascular Institute, Boston, Massachusetts

Decision-Making in Medical Practice

Susan S. Beland, M.D.

Associate Professor, Department of Internal Medicine, Division of General Internal Medicine, University of Arkansas College of Medicine, Little Rock, Arkansas

Awny S. Farajallah, M.D.

Assistant Professor, Department of Internal Medicine, Division of General Internal Medicine, University of Arkansas College of Medicine, Little Rock, Arkansas

Cardiovascular Disease

Eric H. Awtry, M.D.

Instructor in Medicine, Boston University School of Medicine; Director of Education, Section of Cardiology, Boston Medical Center, Boston, Massachusetts

Joseph Loscalzo, M.D., Ph.D.

Wade Professor and Chair, Department of Medicine, Boston University School of Medicine; Physician-in-Chief, Boston Medical Center; Director, Whitaker Cardiovascular Institute, Boston, Massachusetts

Lisa A. Mendes, M.D.

Assistant Professor of Medicine, Boston University School of Medicine; Staff Cardiologist, Boston Medical Center, Boston, Massachusetts

Pulmonary and Critical Care Medicine

Kenneth L. Brigham, M.D.

Ralph and Lulu Owen Professor of Pulmonary Medicine and Director, Center for Lung Research and Division of Allergy, Pulmonary and Critical Care Medicine, Vanderbilt University School of Medicine, Nashville, Tennessee

Bonnie S. Slovis, M.D.

Assistant Professor of Medicine and Director, Outpatient Medicine, Division of Allergy, Pulmonary and Critical Care Medicine, Vanderbilt University School of Medicine, Nashville, Tennessee

Renal Disease

Sameh R. Abul-Ezz, M.D.

Associate Professor of Internal Medicine, Division of Nephrology, University of Arkansas College of Medicine, Little Rock, Arkansas

Thomas E. Andreoli, M.D., M.A.C.P.

Professor and *The Nolan Chair*, Department of Internal Medicine, University of Arkansas College of Medicine, Little Rock, Arkansas

Yousri M. H. Barri, M.D.

Assistant Professor of Internal Medicine, Division of Nephrology, University of Arkansas College of Medicine, Little Rock, Arkansas

Dinesh K. Chatoth, M.D.

Assistant Professor of Internal Medicine, Division of Nephrology, University of Arkansas College of Medicine, Little Rock, Arkansas

Sudhir V. Shah, M.D.

Professor of Internal Medicine and Director, Division of Nephrology, University of Arkansas College of Medicine, Little Rock, Arkansas

Mary Jo Shaver, M.D.

Assistant Professor of Internal Medicine, Division of Nephrology, University of Arkansas College of Medicine, Little Rock, Arkansas

Gastrointestinal Disease

Edgar Achkar, M.D.

Vice Chairman, Department of Gastroenterology,
Cleveland Clinic Foundation, Cleveland, Ohio

Aaron Brzezinski, M.D.

Staff Gastroenterologist, Center for Inflammatory
Bowel Disease, Department of Gastroenterology,
Cleveland Clinic, Cleveland, Ohio

Carol A. Burke, M.D.

Director, Center for Colon Cancer and Polyps,
Department of Gastroenterology, Cleveland Clinic,
Cleveland, Ohio

Darwin L. Conwell, M.D.

Director, Pancreas Clinic, Department of
Gastroenterology, Cleveland Clinic Foundation,
Cleveland, Ohio

Gary W. Falk, M.D.

Director, Center for Swallowing and Esophageal
Disorders, Department of Gastroenterology,
Cleveland Clinic Foundation, Cleveland, Ohio

Joel E. Richter, M.D.

Chairman, Department of Gastroenterology,
Cleveland Clinic Foundation, Cleveland, Ohio

Edy E. Soffer, M.D.

Director, Center for Lower GI Motility Disorders,
Department of Gastroenterology, Cleveland Clinic
Foundation, Cleveland, Ohio

John J. Vargo II, M.D.

Department of Gastroenterology, Cleveland Clinic
Foundation, Cleveland, Ohio

Gregory Zuccaro, Jr., M.D.

Head, Section of GI Endoscopy, Department of
Gastroenterology, Cleveland Clinic Foundation,
Cleveland, Ohio

Diseases of the Liver and Biliary System

Gary A. Abrams, M.D.

Assistant Professor of Medicine, Division of
Gastroenterology and Hepatology, University of
Alabama School of Medicine, Birmingham,
Alabama

Miguel R. Arguedas

Senior Fellow, Gastroenterology and Hepatology,
Department of Medicine, Division of
Gastroenterology and Hepatology, University of
Alabama School of Medicine, Birmingham,
Alabama

Michael B. Fallon, M.D.

Assistant Professor of Medicine, Division of
Gastroenterology and Hepatology, University of
Alabama School of Medicine, Birmingham,
Alabama

Brendan M. McGuire, M.D.

Assistant Professor of Medicine, Division of
Gastroenterology and Hepatology, University of
Alabama School of Medicine, Birmingham,
Alabama

Hematologic Disease

Nancy Berliner, M.D.

Arthur and Isabel Bunker Associate Professor of
Medicine and Genetics, Yale University School of
Medicine, New Haven, Connecticut

Jill Lacy, M.D.

Associate Professor of Medicine, Section of Medical
Oncology, Yale University School of Medicine,
New Haven, Connecticut

Henry M. Rinder, M.D.

Assistant Professor, Department of Laboratory
Medicine and Internal Medicine (Hematology), Yale
University; Director, Coagulation Laboratory, and
Associate Director, Hematology Laboratories, Yale-
New Haven Hospital, New Haven, Connecticut

Eunice S. Wang, M.D.

Fellow, Department of Hematology-Oncology,
Memorial Sloan Kettering Cancer Institute, New
York, New York

Oncologic Disease

Christopher E. Desch, M.D.

Clinical Associate Professor of Medicine, Virginia
Commonwealth University, Medical College of
Virginia; Medical Director, Virginia Cancer
Treatment Centers, Richmond, Virginia

Jennifer J. Griggs, M.D.

Senior Instructor of Medicine, Division of
Hematology/Oncology, University of Rochester
School of Medicine, Rochester, New York

Metabolic Disease

Peter N. Herbert, M.D.

Clinical Professor of Medicine, Yale University School
of Medicine; Chief of Staff and Senior Vice
President for Medical Affairs, Yale-New Haven
Hospital, New Haven, Connecticut

Endocrine Disease

Philip Barnett, M.D., Ph.D.

Associate Professor of Medicine, University of
California, Los Angeles, School of Medicine;
Director, Diabetes Program, Cedars-Sinai Medical
Center, Los Angeles, California

Glenn D. Braunstein, M.D.

Professor of Medicine, University of California, Los
Angeles, School of Medicine; Chairman,
Department of Medicine, Cedars-Sinai Medical
Center, Los Angeles, California

Theodore C. Friedman, M.D., Ph.D.

Assistant Professor of Medicine, University of California, Los Angeles, School of Medicine; Staff Endocrinologist, Cedars-Sinai Medical Center, Los Angeles, California

Vivien Herman-Bonert, M.D.

Associate Professor of Medicine, University of California, Los Angeles, School of Medicine; Clinical Coordinator, Pituitary Clinic, Cedars-Sinai Medical Center, Los Angeles, California

Women's Health**Sally L. Hodder, M.D.**

Associate Professor of Medicine, Case Western Reserve University School of Medicine; Staff Physician, University Hospitals of Cleveland, Cleveland, Ohio

Ame L. Taylor, M.D.

Associate Professor of Medicine, Division of Cardiology, and Vice Chair, Women's Health Programs, Case Western Reserve University School of Medicine; Attending Physician, University Hospitals of Cleveland, Cleveland, Ohio

Diseases of Bone and Bone Mineral Metabolism**F. Richard Bringham, M.D.**

Associate Professor of Medicine, Harvard Medical School, Endocrine Unit; Chief of Staff, Massachusetts General Hospital, Boston, Massachusetts

Joel S. Finkelstein, M.D.

Associate Professor of Medicine, Harvard Medical School, Endocrine Unit; Massachusetts General Hospital, Boston, Massachusetts

Margaret P. Seton, M.D.

Instructor in Medicine, Harvard Medical School, Arthritis Unit; Massachusetts General Hospital, Boston, Massachusetts

Musculoskeletal and Connective Tissue Disease**Joseph Korn, M.D.**

Professor of Medicine and Biochemistry, Arthritis Center, Boston University School of Medicine, Boston, Massachusetts

Peter A. Merkel, M.D., M.P.H.

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

Robert W. Simms, M.D.

Associate Professor of Medicine and Clinical Director, Section of Rheumatology, Boston University School of Medicine, Boston, Massachusetts

Infectious Disease**Charles C. J. Carpenter, M.D., M.A.C.P.**

Professor of Medicine and Director, International Health Institute, Brown University School of Medicine, Providence, Rhode Island

Michael M. Lederman, M.D.

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

Robert A. Salata, M.D.

Professor of Medicine, Vice-Chairman, Department of Medicine, and Chief, Division of Infectious Diseases, Case Western Reserve University; Attending Physician and Consultant and Medical Director, Hospital Epidemiology and Infection Control, University Hospitals of Cleveland, Cleveland, Ohio

Neurologic Disease**Timothy J. Counihan, M.D., MRCPI**

Assistant Professor of Neurology, University of Rochester School of Medicine, Rochester, New York

Jennifer J. Griggs, M.D.

Senior Instructor of Medicine, Division of Hematology/Oncology, University of Rochester School of Medicine, Rochester, New York

Robert C. Griggs, M.D.

Edward A. and Alma Vollertsen Rykenboer Professor of Neurophysiology, and Chair, Department of Neurology, University of Rochester School of Medicine and Dentistry, Rochester, New York

Frederick J. Marshall, M.D.

Assistant Professor of Neurology and Chief, Geriatric Neurology Unit, Department of Neurology, University of Rochester School of Medicine and Dentistry, Rochester, New York

Roger P. Simon, M.D.

Robert Stone Dow Chair in Neurology and Director, Neurobiology Research, Legacy Health Systems, Portland, Oregon

The Aging Patient**David A. Lipschitz, M.D., Ph.D.**

Professor and Chairman, *Donald W. Reynolds* Department of Geriatrics, University of Arkansas College of Medicine, Little Rock, Arkansas

Robert J. Reis, M.D.

Professor of Geriatrics, University of Arkansas College of Medicine, Little Rock, Arkansas

Dennis H. Sullivan, M.D.

Associate Professor of Geriatrics, University of
Arkansas College of Medicine, Little Rock,
Arkansas

Timothy E. Holcomb, M.D.

Associate Professor of Internal Medicine, University
of Arkansas College of Medicine; Associate Chief
of Staff for Primary Care, John L. McClellan VA
Hospital, Little Rock, Arkansas

Substance Abuse

Jeffrey L. Clothier, M.D.

Associate Professor of Psychiatry, University of
Arkansas College of Medicine; Chief, Ambulatory
Mental Health Service, John L. McClellan VA
Hospital, Little Rock, Arkansas



PREFACE

The fifth edition of *Cecil Essentials of Medicine*, like the preceding editions, is a succinct and yet comprehensive textbook of internal medicine that considers the biologic basis for understanding disease processes, the clinical characteristics of diseases, and the compassionate and rational approaches to the diagnosis and treatment of diseases commonly encountered by practitioners of internal medicine and the medical subspecialties. Thus, this book is intended primarily for medical students; house officers; practitioners of general medicine, internal medicine and other subspecialties, and other medical disciplines; and other persons involved either in preventive medicine or in caring for patients.

This fifth edition of *Essentials* has been revised extensively. Two new Editors, Robert C. Griggs and Joseph Loscalzo, have replaced J. Claude Bennett, an Editor for the third and fourth editions, and Fred Plum, one of the founding Editors of *Essentials*. Three new sections have been added: Molecular Medicine; Evidence-Based Medicine; and Women's Health. The Oncology section has been expanded. New authors have rewritten seven sections entirely, and the remaining sections have been revised exhaustively with regard to both content and timeliness. As with the fourth edition, this edition utilizes four-color illustrations extensively. Finally, expansion of tabular material and algorithms enabled us to make the fifth edition of *Essentials* more readable and yet approximately 10% smaller than the preceding edition.

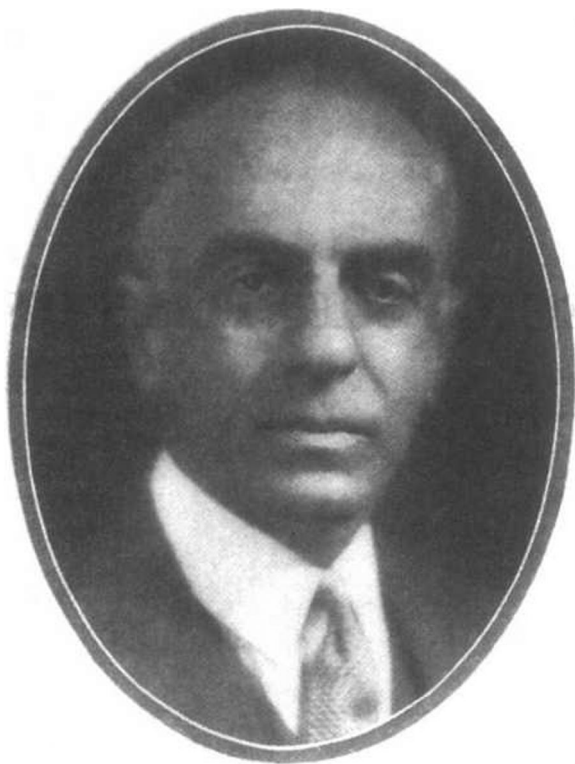
We are deeply grateful to a number of individuals. The legacy of both Claude Bennett and Fred Plum, to whom this edition is dedicated, remains. Dr. Susan S. Beland, Associate Professor of Internal Medicine at the University of Arkansas, reviewed all the content for this edition.

We also thank Ms. Lynne Gery, Manager, Developmental Editors, and Ms. Lisette Bralow, Executive Publisher, Medical Books, both of the W.B. Saunders Company, who contributed their customary excellence in the design and preparation of the fifth edition of *Essentials*. Mr. Leslie E. Hoeltzel, Emeritus Manager, Developmental Editors, assisted with prior editions of *Essentials* and with the initial planning for this edition. Finally, we thank our very able secretarial staff, Ms. Clementine M. Whitman (Little Rock); Ms. Barbara S. Ryan (Providence); Ms. Katherine A. Seropian (Boston); and Ms. Shirley E. Thomas (Rochester).

THE EDITORS



CECIL ESSENTIALS OF MEDICINE



Russell L. Cecil, M.D.

The Editors thought it appropriate that readers of *Cecil Essentials of Medicine* understand why the book has commemorated the name of Dr. Cecil. These comments are particularly apt for today's readers, inasmuch as the first edition of *Cecil Essentials of Medicine* was published in 1986, 21 years after Dr. Cecil's death.

Dr. Cecil was born in 1882 and received his M.D. degree from the Medical College of Virginia in 1906. After training in Berlin and Vienna and at Johns Hopkins Hospital (Baltimore) and Presbyterian Hospital (New York), Dr. Cecil joined the faculty of Cornell University Medical College in 1915, where he spent the remainder of his career.

Dr. Cecil realized that the subject of internal medicine was too large in scope to be encompassed by a book written by a single individual and that advances in internal medicine were occurring at a rapidly accelerating pace. These tenets provided the basic motif for *The Cecil Textbook of Medicine*, first published in 1927: a comprehensive textbook written by distinguished experts and revised frequently in order to maintain currency.

Dr. Cecil's major clinical interests were in infectious diseases, particularly the pneumonias, and in rheumatologic diseases, particularly arthritis. He developed one of the first arthritis clinics in the United States, was a founding member of the American Rheumatism Association (ARA), and served as President of the ARA in 1937. His *Textbook of Medicine* rapidly became a standard throughout the world. He served as the sole Editor of *The Cecil Textbook of Medicine* for the first seven editions.

The Editors of *Essentials*, together with W.B. Saunders Company, have recognized the contributions of this exceptional clinician, scholar, and author by maintaining his name on the title of *Cecil Essentials of Medicine*.

T. E. ANDREOLI, EDITOR-IN-CHIEF

C. C. J. CARPENTER

R. C. GRIGGS

J. LOSCALZO



CONTENTS

SECTION I

Introduction to Molecular Medicine..... 1

1 THE MOLECULAR BASIS OF HUMAN DISEASE3

Joseph Loscalzo

- Deoxyribonucleic Acid and the Genetic Code 3
- Regulation of Gene Expression 5
- Genetic Variation, Population Diversity, and Genetic Polymorphisms 7
- Genes and Human Disease 8
- Gene Mapping 9
- Identifying Mutant Genes 10
- Molecular Diagnostics 11
- Genetic Therapies 12
- Promising Advances 12

SECTION II

Decision-Making in Medical Practice..... 13

2 EVIDENCE-BASED MEDICINE..... 15

Awny S. Farajallah • Susan S. Beland

- Searching for Relevant Information 15
- Critical Appraisal of the Literature 16
- Evaluating Evidence About Diagnostic Tests 16
- Evaluating Evidence About Outcome 17
- Evaluating Evidence About Treatment 17
- Including the Patient in the Decision Process 18

SECTION III

Cardiovascular Disease 19

3 STRUCTURE AND FUNCTION OF THE NORMAL HEART AND BLOOD VESSELS 21

Eric H. Awtry • Joseph Loscalzo

- Microscopic Anatomy 21
- Gross Anatomy 21
- The Circulatory Pathway 22
- The Conduction System 23
- Neural Innervation 24
- Physiology of Contraction 24
- Circulatory Physiology and the Cardiac Cycle 24
- Cardiac Performance 25
- Physiology of the Coronary Circulation 27

- Physiology of the Systemic Circulation 28
- Physiology of the Pulmonary Circulation 28
- Cardiovascular Response to Exercise 29

4 EVALUATION OF THE PATIENT WITH CARDIOVASCULAR DISEASE.....30

Eric H. Awtry • Joseph Loscalzo

- History 30
- Physical Examination 34
- Auscultation 37

5 DIAGNOSTIC TESTS AND PROCEDURES IN THE PATIENT WITH CARDIOVASCULAR DISEASE..... 43

Lisa A. Mendes • Joseph Loscalzo

- Chest Radiography 43
- Electrocardiography 43
- Abnormal ECG Patterns 45
- Long-Term Ambulatory ECG Recording 47
- Stress Testing 48
- Echocardiography 50
- Nuclear Cardiology 52
- Cardiac Catheterization 52
- Right-Sided Heart Catheterization 53
- Other Procedures 53
- Noninvasive Vascular Testing 55

6 HEART FAILURE AND CARDIOMYOPATHY 56

Lisa A. Mendes • Joseph Loscalzo

- Forms of Heart Failure 56
- Adaptive Mechanisms in Heart Failure 56
- Evaluation and Treatment of Patients with Heart Failure 57
- Treatment 59
- Refractory Heart Failure 60
- Cardiovascular Assist Devices 61
- Acute Pulmonary Edema 61
- Diastolic Dysfunction 61

7 CONGENITAL HEART DISEASE 63

Lisa A. Mendes • Joseph Loscalzo

- General Considerations 63
- Fetal and Transitional Circulations 63
- Congenital Aortic Stenosis 63

Coarctation of the Aorta 64
 Pulmonic Valve Stenosis 65
 Tetralogy of Fallot 65
 Atrial Septal Defect 66
 Ventricular Septal Defect 67
 Patent Ductus Arteriosus 68
 Other Congenital Abnormalities 68

8 ACQUIRED VALVULAR HEART DISEASE 69

Lisa A. Mendes • Joseph Loscalzo

Aortic Stenosis 69
 Aortic Regurgitation 70
 Mitral Stenosis 72
 Mitral Regurgitation 74
 Mitral Valve Prolapse 74
 Tricuspid Stenosis 75
 Tricuspid Regurgitation 75
 Pulmonic Stenosis and Regurgitation 76
 Multivalvular Disease 76
 Rheumatic Heart Disease 76
 Prosthetic Heart Valves 77
 Endocarditis Prophylaxis 77

9 CORONARY HEART DISEASE 79

Eric H. Awtry • Joseph Loscalzo

Epidemiology 79
 Pathophysiology of Atherosclerosis 79
 Risk Factors 80
 Nonatherosclerotic Causes of Cardiac Ischemia 81
 Pathophysiology and Consequences of Myocardial Ischemia 82
 Angina Pectoris 82
 Acute Myocardial Infarction 90

10 CARDIAC ARRHYTHMIAS 100

Eric H. Awtry • Joseph Loscalzo

Mechanisms of Arrhythmogenesis 100
 Approach to the Patient with Suspected Arrhythmias 103
 Management of Cardiac Arrhythmias 104
 Specific Arrhythmias 111
 Heart Block 120
 Clinical Syndromes 122
 Principles of Cardiopulmonary Resuscitation 125

11 MYOCARDIAL AND PERICARDIAL DISEASE 127

Lisa A. Mendes • Joseph Loscalzo

Myocarditis 127
 Cardiomyopathy 128
 Amyloidosis 131
 Pericardial Disease 132

12 OTHER CARDIAC TOPICS 137

Lisa A. Mendes • Joseph Loscalzo

Cardiac Tumors 137
 Traumatic Heart Disease 138
 Cardiac Surgery 139
 Noncardiac Surgery in the Cardiac Patient 140
 Cardiac Disease in Pregnancy 142
 Specific Cardiac Conditions 142

13 VASCULAR DISEASES AND HYPERTENSION 145

Eric H. Awtry • Joseph Loscalzo

Systemic Vascular Disease 145
 Venous Thromboembolic Disease 152
 Pulmonary Vascular Disease 155
 Hypertension 157

**SECTION IV
 Pulmonary and Critical Care Medicine 165**

14 APPROACH TO THE PATIENT WITH RESPIRATORY DISEASE 167

Bonnie S. Slovis • Kenneth L. Brigham

Common Presenting Complaints 167
 Physical Examination 169

15 ANATOMIC AND PHYSIOLOGIC CONSIDERATIONS 172

Bonnie S. Slovis • Kenneth L. Brigham

Anatomy 172
 Physiology 173
 Abnormalities of Pulmonary Gas Exchange 177

16 DIAGNOSTIC TECHNIQUES AND THEIR INDICATIONS 181

Bonnie S. Slovis • Kenneth L. Brigham

Imaging Procedures 181
 Evaluation of Lung Function 181

17 OBSTRUCTIVE LUNG DISEASE 185

Bonnie S. Slovis • Kenneth L. Brigham

Pathophysiology of Air Flow Obstruction 185
 Asthma 186
 Chronic Obstructive Pulmonary Disease 187
 Bronchiectasis 189
 Cystic Fibrosis 189
 Treatment 190

18 INTERSTITIAL AND INFILTRATIVE LUNG DISEASE 194

Bonnie S. Slovis • Kenneth L. Brigham

Pathophysiology and Clinical Manifestations 194

19 DISORDERS OF THE PLEURAL SPACE, MEDIASTINUM, AND CHEST WALL 201

Bonnie S. Slovis • Kenneth L. Brigham

Pleural Disease 201
 Mediastinal Disease 203
 Chest Wall Disease 203

20 NEOPLASTIC DISEASES OF THE LUNG 206

Bonnie S. Slovis • Kenneth L. Brigham

Risk Factors 206
 Pathology 206
 Clinical Presentation 206
 Diagnosis and Evaluation 207
 Solitary Pulmonary Nodule 208
 Treatment and Prognosis 209

21 DISORDERED BREATHING.....210
Bonnie S. Slovis • Kenneth L. Brigham
 Sleep Apnea Syndrome 210
 Other Breathing Disorders 211

22 ENVIRONMENTAL AND OCCUPATIONAL INJURY.....213
Bonnie S. Slovis • Kenneth L. Brigham
 Pneumoconioses 213
 Air Pollution 213
 Noxious Gases and Fumes 214
 Smoke Inhalation 214
 High-Altitude Injury 215
 Drowning and Near-Drowning 215

23 ESSENTIALS OF PULMONARY CRITICAL CARE MEDICINE216
Bonnie S. Slovis • Kenneth L. Brigham
 Shock 216
 Acute Respiratory Failure 217
 Oxygen Therapy 217
 Mechanical Ventilation 218
 Complications of Endotracheal Intubation and Mechanical Ventilation 219
 Systemic Inflammatory Response Syndrome, Sepsis, Multiple Organ Dysfunction Syndrome, and Adult Respiratory Distress Syndrome 219

SECTION V
Renal Disease221

24 ELEMENTS OF RENAL STRUCTURE AND FUNCTION.....223
Dinesh K. Chatoth
 Elements of Renal Structure 223
 Elements of Renal Physiology 226

25 APPROACH TO THE PATIENT WITH RENAL DISEASE232
Yousri M. H. Barri • Sudhir V. Shah
 Assessment of the Patient with Renal Disease 232
 The Major Renal Syndromes 234
 Radiologic Imaging of the Urinary Tract 236
 Renal Biopsy 237

26 FLUID AND ELECTROLYTE DISORDERS238
Thomas E. Andreoli • Samah R. Abul-Ezz
 Volume Disorders 238
 Osmolality Disorders 241
 Hyponatremia 242
 Hypernatremia 244
 Disturbances in Potassium Balance 245
 Disturbances in Acid-Base Balance 248

27 GLOMERULAR DISEASES.....253
Sudhir V. Shah
 The Glomerulus 253
 Mechanisms of Glomerular Injury 253
 Clinical Manifestations of Glomerular Disease 253

Approach to the Patient with Glomerular Disease 255
 Acute Nephritic Syndrome 255
 Rapidly Progressive Glomerulonephritis 257
 Nephrotic Syndrome 258
 Asymptomatic Urinary Abnormalities 263

28 MAJOR NONGLOMERULAR DISORDERS266
Dinesh K. Chatoth
 Tubulointerstitial Nephropathy 266
 Cystic Diseases of the Kidney 269
 Urinary Tract Obstruction 271
 Nephrolithiasis 272
 Renal Neoplasia 275

29 VASCULAR DISORDERS OF THE KIDNEY278
Yousri M. H. Barri
 Renal Arterial Occlusion 278
 Ischemic Renal Disease 278
 Arterioles and Microvasculature 279
 Atheroembolic Diseases of the Kidney 279
 Chronic Hypertensive Nephrosclerosis 280
 Malignant Nephrosclerosis 280
 Scleroderma 280
 Hemolytic-Uremic Syndrome and Thrombotic Thrombocytopenic Purpura 281
 Antiphospholipid Syndrome and the Kidney 281
 Renal Vein Thrombosis 282

30 ACUTE RENAL FAILURE283
Sudhir V. Shah
 Definition and Etiology 283
 Differential Diagnosis and Diagnostic Evaluation of the Patient 283
 Clinical Presentation, Complications, and Management of Acute Tubular Necrosis 287
 Specific Causes of Acute Renal Failure 288

31 CHRONIC RENAL FAILURE291
Mary Jo Shaver
 Adaptation to Nephron Loss 291
 Conservative Management 292
 Clinical Manifestations 293
 Treatment of End-Stage Renal Failure 296

SECTION VI
Gastrointestinal Disease301

32 COMMON CLINICAL MANIFESTATIONS OF GASTROINTESTINAL DISEASE.....303

A. Abdominal Pain 303
Edgar Achkar
 Physiology 303
 Causes of Abdominal Pain 303
 Clinical Features 303
 The Acute Abdomen 305
 Chronic Abdominal Pain 305

B. Gastrointestinal Hemorrhage 306

Gregory Zuccaro, Jr.

- Acute Gastrointestinal Hemorrhage 306
- Chronic Gastrointestinal Hemorrhage 309

C. Malabsorption 310

Edy E. Soffer

- Digestion and Absorption of Fat 310
- Digestion and Absorption of Carbohydrates 310
- Digestion and Absorption of Proteins 310
- Mechanisms of Malabsorption 310
- Multiple Mechanisms 311
- Clinical Manifestations of Malabsorption 311
- Tests for Malabsorption 312
- Approach to the Patient with Suspected Malabsorption 314
- Treatment 314

D. Diarrhea 316

Edy E. Soffer

- Definition 316
- Normal Physiology 316
- Pathophysiology 317
- Evaluation of Diarrhea 318

33 ENDOSCOPIC AND RADIOGRAPHIC PROCEDURES IN GASTROENTEROLOGY 321

John J. Vargo II

- Gastrointestinal Endoscopy 321
- Esophagogastroduodenoscopy and Enteroscopy 321
- Endoscopic Retrograde Cholangiopancreatography 322
- Endoscopic Ultrasonography 323
- Sigmoidoscopy and Colonoscopy 323
- Radiographic Procedures 323

34 DISEASES OF THE ESOPHAGUS..... 326

Joel E. Richter

- Normal Esophageal Physiology 326
- Clinical Symptoms of Esophageal Disease 326
- Gastroesophageal Reflux Disease 327
- Motility Disorders of the Oropharynx and Esophagus 329
- Other Esophageal Disorders 330

35 DISEASES OF THE STOMACH AND DUODENUM 332

Gary W. Falk

- Gastroduodenal Anatomy 332
- Gastroduodenal Mucosal Secretion and Protective Factors 332
- Gastroduodenal Motor Physiology 333
- Gastritis 334
- Peptic Ulcer Disease 335
- Zollinger-Ellison Syndrome 341
- Delayed Gastric Emptying 342
- Rapid Gastric Emptying 343

36 INFLAMMATORY BOWEL DISEASE..... 345

Aaron Brzezinski

- Etiology 345
- Incidence and Epidemiology 345
- Ulcerative Colitis: Clinical Features 346
- Crohn's Disease: Clinical Features 346

- Extraintestinal Manifestations 346
- Other Complications 346
- Colon Cancer 347
- Diagnosis 347
- Differential Diagnosis 347
- Treatment 347

37 NEOPLASMS OF THE GASTROINTESTINAL TRACT..... 351

Carol A. Burke

- Esophageal Carcinoma 351
- Gastric Carcinoma 352
- Colorectal Polyps and Carcinoma 353
- The Polyposis Syndromes 354
- Carcinoid Tumors 355

38 DISEASES OF THE PANCREAS..... 356

Darwin L. Conwell

- Anatomy and Physiology 356
- Acute Pancreatitis 358
- Chronic Pancreatitis 361
- Carcinoma of the Pancreas 362

SECTION VII Diseases of the Liver and Biliary System..... 365

39 LABORATORY TESTS IN LIVER DISEASE 367

Michael B. Fallon • Brendan M. McGuire Gary A. Abrams • Miguel R. Arguedas

- Clinical Approach to Liver Disease 367
- Laboratory Tests of Liver Function and Disease 367
- Liver Biopsy 370

40 JAUNDICE..... 371

Michael B. Fallon • Brendan M. McGuire Gary A. Abrams • Miguel R. Arguedas

- Bilirubin Metabolism 371
- Laboratory Tests for Bilirubin 371
- Clinical Classification 372
- Approach to Diagnosis 374

41 ACUTE AND CHRONIC HEPATITIS 376

Michael B. Fallon • Brendan M. McGuire Gary A. Abrams • Miguel R. Arguedas

- Acute Hepatitis 376
- Chronic Hepatitis 383

42 FULMINANT HEPATIC FAILURE 385

Michael B. Fallon • Brendan M. McGuire Gary A. Abrams • Miguel R. Arguedas

- Diagnosis 385
- Treatment 385
- Hepatic Transplantation 386
- Prognosis 386

43 CIRRHOSIS OF THE LIVER AND ITS COMPLICATIONS..... 387

Michael B. Fallon • Brendan M. McGuire Gary A. Abrams • Miguel R. Arguedas

- Clinical and Laboratory Features 387
- Specific Causes 387