

18th edition

CECIL

TEXTBOOK

OF



MEDICINE

*Edited by*

JAMES B. WYINGARDEN, M.D.

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

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# TEXTBOOK OF MEDICINE



*Edited by*

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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.

Available from W. B. Saunders Company  
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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.

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*Reference Intervals and Laboratory Values of Clinical Importance*

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*Occupational Diseases of the Skin*

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*Diseases of Muscle and Neuromuscular Junction*

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*The Epilepsies*

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*The Extrapyramidal Disorders*

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*Diseases of the Spleen*

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*Sarcoidosis*

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*Glucocorticosteroid Therapy*

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*Complement*

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*Peptic Ulcer: Complications*

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*Clonal Development and Stem Cell Origin of Proliferative Disorders*

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*Rabies*

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*Prostaglandins and Related Compounds*

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*Pain and Its Management*

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*Sickle Cell Anemia and Associated Hemoglobinopathies*

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*Legionellosis*

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*Epidemiology of Cardiovascular Disease*

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*The Preventive Health Examination*

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*Approach to the Patient with Musculoskeletal Disease*

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*Neuroendocrine Regulation and Its Disorders; The Anterior Pituitary*

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*Cystic Disease of the Kidney*

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*Retroviruses That Cause Human Disease*

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*Advice to Travelers*

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*Eye Diseases*

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*Hodgkin's Disease*

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*Diseases Caused by Non-Spore-Forming Anaerobic Bacteria*

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*Acute Renal Failure*

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*Onchocerciasis*

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*Electrocardiography*

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*Vascular Diseases of the Intestine*

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*Langerhans Cell Granulomatosis; The Acquired Immunodeficiency Syndrome*

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*Pancreatic Islet Cell Tumors*

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*Campylobacter Enteritis; Enteric Escherichia coli Infections*

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*Chromosomes and Their Disorders*

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*Parameningeal Infections*

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*Exercise and Health*

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*Wegener's Granulomatosis and Midline Granuloma*

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*Renal Disease in Pregnancy*

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*Polymyalgia Rheumatica and Giant Cell Arteritis*

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

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*Variola and Vaccinia*

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*Diphtheria*

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*Sleep and Its Disorders*

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*Disorders of Purine Metabolism*

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*Congenital Malformations*

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*Critical Care Medicine*

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*Dracunculiasis*

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*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*

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*Trichinellosis*

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*Osteoarthritis; The Painful Shoulder; The Painful Back*

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

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

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*Disorders of Sexual Differentiation*

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

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*Syphilitic Infections of the Central Nervous System*

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*Ethics in the Practice of Medicine*

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*The Judicious Diet*

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*The Common Cold; Viral Gastroenteritis*

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*Hemolytic Disorders: Introduction; Acquired Hemolytic Disorders*

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*Congenital Heart Disease*

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*Whooping Cough; Measles; Rubella*

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*Introduction to the Anemias; Anemia Due to Bone Marrow Failure*

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*Alcohol Abuse and Alcohol-Related Illnesses*

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*Structure and Function of the Kidneys*

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*Disorders Due to Heat and Cold*

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*Chronic Renal Failure*

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*Gaucher's Disease; Niemann-Pick Disease*

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*Vascular Diseases of the Limbs*

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*Connective Tissue Structure and Function*

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*Streptococcal Diseases*

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*Diarrhea*

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*Arthropods and Leeches*

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*Amebiasis*

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*Normochromic Normocytic Anemias; Hypochromic Anemias*

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*Care of Dying Patients and Their Families*

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*Cytomegalovirus Infection*



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*The Thyroid*

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*Oncology: Introduction*

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*Degenerative Diseases of the Nervous System*

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*Panniculitis and Disorders of the Subcutaneous Fat*

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*Pharmacologic Principles Related to the Autonomic Nervous System*

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*Systemic Sclerosis*

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*Ulcerative Colitis*

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*Pancreatitis*

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*Mastocytosis*

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*Anaphylaxis; Insect Sting Allergy*

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*Adolescent Medicine*

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*Polyglandular Disorders*

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*Hirsutism*

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*Trace Metal Poisoning*

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*Dialysis*

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*Hereditary Defects in the Membrane or Metabolism of the Red Cell*

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*Introduction to Protozoan and Helminthic Diseases; Schistosomiasis*

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*Lyme Disease; Infectious Arthritis*

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*Diseases of the Gallbladder and Bile Ducts*

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*Bone Tumors*

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*Hemorrhagic Disorders: Abnormalities of Platelet and Vascular Function*

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*Cat Scratch Disease*

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*Overview of Imaging Techniques and Projection for the Future*

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*Toxoplasmosis; Pneumocystosis*

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*Chronic Airways Diseases: Abnormalities of Lung Aeration*

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*Tubulointerstitial Diseases and Toxic Nephropathies*

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*Introduction to Cerebrovascular Diseases*

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*Arthropod-Borne Viral Encephalitides*

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*Clinical Approach to the Patient*

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*Disorders of Blood Coagulation*

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*Hemochromatosis; Hereditary Syndromes Involving Multiple Organ Systems*

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*Viral Pharyngitis, Laryngitis, Croup, and Bronchitis*

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*Diabetes and the Kidney*

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*Introduction to Hematologic Diseases*

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*Natriuretic Factors*

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*Hemoglobin Synthesis; The Thalassemias*

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

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*Drug Abuse and Dependence*

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*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*

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*Endocrine Manifestations of Tumors: "Ectopic" Hormone Production*

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*Diabetes Mellitus*

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*Arterial Hypertension*

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*Filariasis*

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*Renal Calculi*

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*Cutaneous Manifestations of Internal Malignancy; Skin Diseases*

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*Clinical Decision Making*

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*The Immune System: Introduction*

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*Blood Transfusion*

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*Diseases of the Myocardium*

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*Peptic Ulcer: Medical Therapy; Gastrointestinal Hemorrhage*