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*Twenty-Second Edition*

**The Principles  
and Practice  
of Medicine**

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# The Principles and Practice of Medicine

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VI

## Preface to the Twenty-Second Edition

This Edition of *The Principles and Practice of Medicine* is the sixth that we have edited in the past 20 years.

In preparation for this edition each section of the Twenty-First Edition was sent to two external reviewers for their comments and expert criticism. This detailed outside review was helpful to us in planning our revisions for this new edition. It prompted us to address issues which they raised as well as a host of related issues.

This textbook continues to reflect the coherent view of a single institution—Johns Hopkins. Nevertheless, institutions change and evolve from edition to edition and certainly the *practice* of medicine advances rapidly between editions. There are also fresh approaches to clinical problem-solving and new insights into patient management, that is, there are advances in *principles* as well. This edition has been extensively revised in response to these advances and changes. In addition, the sequence of sections has been changed to reflect newly developed connections between clinical problem areas.

In this edition we have a number of new section editors: Joseph T. Coyle, Jr., H. Franklin Herlong, Dudley P. Jackson, Paul W. Ladenson, Simeon Margolis, John R. Michael, William E. Mitch, Mack C. Mitchell, Mark C. Rogers, J.T. Sylvester, and Peter B. Terry.

We also welcome 59 new contributors to this edition. They include: Elaine L. Alexander, A. Michael Borkon, Jason Brandt, Barbara L. Braunstein, Henry Brem, Roy G. Brower, Philip J. Burke, John R. Burton, David S. Cooper, David R. Cornblath, Robert S. Fisher, William R. Furman, Francis M. Giardiello, Vincent L. Gott, Stuart S. Grossman, Thomas Guarnieri, Alan D. Guerci, Bruce Hamilton, Douglas A. Jabs, Dudley P. Jackson, Donald R. Jasinski, David B. Kafonek, Allan Krumholz, Paul W. Ladenson, W. Lowell Maughan, Andrew R. Mayrer, Justin C. McArthur, Esteban Mezey, William E. Mitch, John F. Modlin, Cheryl L. Newman, Godfrey D. Pearson, David B. Pearse, Thomas A. Pearson, Stephen P. Peters, Marshall Plaut, Leonard R. Proctor, Peter Rock, Mark C. Rogers, Barry W. Rovner, Chester W. Schmidt, Jr., Marvin M. Schuster, Stephen S. Selinger, James V. Sitzmann, Keith T. Sivertson, Barney J. Stern, Mark L. Teitelbaum, Melvyn S. Tockman, Larry E. Tune, Martin D. Valentine, Sandra M. Walden, Gary D. Walford, Patrick C. Walsh, Gary S. Wand, Andrew C. Warren, Gail G. Weinmann, Paul S. Wheeler, Howard A. Zaccur, and Carol M. Ziminski.

We also wish to thank the section editors and authors who have contributed not only to this edition but to previous editions as well. Their experience is invaluable, and their continued interest, effort, and tolerance are warmly appreciated.

As in the last edition Ms. Christine D. Young prepared the illustrative material. We appreciate her skill in communicating complex topics clearly and artistically.

Finally, we are grateful to those who assisted us so ably in the preparation of this edition, particularly Mrs. Sandra M. Sann.

THE EDITORS



## Preface to the Seventeenth Edition

In 1892 the first edition of Sir William Osler's textbook was published, in which he covered single-handedly the entire field of medicine. His book was well received both as a scientific work and as a contribution to literature. When the time came for the seventh edition, he wrote the following in a letter to Dr. Lewellys Barker: "This new edition will not be a very serious revision, as they will not break up the plates, but in the next edition we can do as we like. It would be very nice if you and Thayer came in with me as joint authors. It would be possible, I think, to arrange to have the work kept up as a Johns Hopkins Textbook of Medicine." This never came about. After Dr. Osler's death, the textbook was edited by Dr. Thomas McCrae until the completion of the twelfth edition in 1935. After the death of Dr. McCrae, Dr. Henry Christian continued as editor through the sixteenth and last edition published in 1947.

This current revision was conceived as a Johns Hopkins Textbook of Medicine as proposed by Osler. There was hesitancy to assume this task in view of the several excellent, comprehensive textbooks of medicine already available. However, it was decided that there was a need for a different type of textbook, one which would complement the existent encyclopedic texts. This text emphasizes clinical problems rather than disease entities. It attempts to describe and define the way in which the experienced physician approaches the solution and management of such problems.

This is clearly not a revision of Dr. Osler's great book. Nor is it the product of a single author. Rather, it is the product of a single department in which the preservation of a heritage of clinical excellence has been a major goal. We hope this volume reflects the tradition of excellence which this Department of Medicine received from Dr. Osler.

THE EDITORS

## A Note from the Editors

In the practice of medicine the physician is confronted by three basic questions:

1. What is the matter with the patient?
2. What can I do for him?
3. What will be the outcome?

A fourth question, Why did it happen? will also arise in the mind of the inquiring physician who feels that each patient affords an opportunity and imposes a responsibility to contribute to a better understanding of causation and prevention.

The usual textbook of medicine does not prepare the practitioner to deal systematically with these questions. Its focus is upon the disease rather than the patient. It presents its subject matter in a series of essays each devoted to a description—as simple and straightforward as possible—of the disease entity. Some general information may be provided but rarely is sufficient emphasis placed upon the confusing complexities which arise in the day-to-day investigation and management of clinical problems.

The answer to the first of the questions enumerated above is the key to the answers to the second and third. The first question is the only one that requires an analytical approach, and obviously the analysis must begin with a study of the patient and must continue to be focused upon the patient until a solution is reached.

It is our purpose to produce a book which is built around the patient rather than the disease—the patient and the problems which he presents in diagnosis, management, and prognosis. Consideration will be given to the methods employed in acquiring factual data, the discriminating use of ancillary diagnostic techniques, and the systematic analysis of the accumulated information. This book also presents the essential information necessary for an understanding of the basic mechanisms involved in the various manifestations of disease, the important features of the natural history of the major diseases, the principles involved in the management of the patient, and the estimation of the probable outcome. In order to devote more space to the sequential steps which should be taken by the physician seeking the answers to his three basic questions, we have avoided as far as possible duplication of the type of presentation so successfully employed in texts already available. Since much of the material contained in current texts is to be sacrificed, the physician may have to turn elsewhere to fill the gaps in his knowledge of the subject in hand. To meet this need for quick access to more detailed information on specific topics, particular attention has been devoted to the selection of the bibliography.

William Osler, having recognized a clear need for a fresh endeavor in the textbook field, assumed responsibility for the task, and in 1892 published the first edition of *The Principles and Practice of Medicine*. The book had gone through six editions by the time Osler left Hopkins for Oxford in 1905. Soon after his arrival at Oxford he began to give thought to the disposition of the authorship of the book. In 1908, while in the throes of preparing the seventh edition, he wrote to Lewellys F. Barker, his successor in the Chair of Medicine at Hopkins, suggesting that he and William S. Thayer, one of Osler's former chief medical residents at Hopkins, join him (Osler) as joint authors. He expressed the belief that it should be possible to arrange to have the work kept up as a Johns Hopkins Hospital textbook of medicine. Osler expressed the view that some arrangement could be made with the publishers and a plan devised by which the head of the medical department would have ex-officio rights in it.

Osler's proposal appears to have had a cool reception from Barker and Thayer because with the eighth edition Thomas McCrae, a former Osler resident and later Professor of Medicine at Jefferson Medical College, joined Osler in editing the textbook. After Osler's death in 1919 and until his own death in 1935, McCrae continued the book (the ninth through the twelfth editions), taking sole responsibility. Henry A. Christian (1876-1951), professor of medicine at Harvard Medical School and Physician-in-Chief of the Peter Bent Brigham Hospital, took over the editorship with the 13th edition (1938). The last edition edited by Christian, the 16th, appeared in 1947. Thus, through its existence up to this 1947 edition, it continued as a one man book throughout.

In 1963 Mr. George McDermott of Appleton-Century-Crofts proposed that the book be taken over by the Department of Medicine at Hopkins as a Johns Hopkins textbook of Medicine. This suggestion was implemented and the 17th edition of *The Principles and Practice of Medicine* appeared in 1968 with A. McGehee Harvey, Leighton E. Cluff, Richard J. Johns, Albert H. Owens, Jr., David Rabinowitz, and Richard S. Ross as editors. For the 18th edition in 1972 and the 19th in 1976 the editors were Harvey, Johns, Owens, and Ross. For the 20th edition in 1980 these editors were joined by Victor A. McKusick and the same authors were responsible for the 21st edition which appeared in 1984.

Edition	Author(s)	Year
First	William Osler	1892
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Fourth	William Osler	1901
Fifth	William Osler	1904
Sixth	William Osler	1905
Seventh	William Osler	1909
Eighth	William Osler Thomas McCrae	1914
Ninth	William Osler Thomas McCrae	1920
Tenth	Thomas McCrae	1926
Eleventh	Thomas McCrae	1930
Twelfth	Thomas McCrae	1935
Thirteenth	Henry A. Christian	1938
Fourteenth	Henry A. Christian	1942
Fifteenth	Henry A. Christian	1944
Sixteenth	Henry A. Christian	1947
Seventeenth	A. McGehee Harvey Leighton E. Cluff Richard J. Johns Albert H. Owens, Jr. David Rabinowitz Richard S. Ross	1968
Eighteenth	A. McGehee Harvey Richard J. Johns Albert H. Owens, Jr. Richard S. Ross	1972
Nineteenth	A. McGehee Harvey Richard J. Johns Albert H. Owens, Jr. Richard S. Ross	1976
Twentieth	A. McGehee Harvey Richard J. Johns Victor A. McKusick Albert H. Owens, Jr. Richard S. Ross	1980
Twenty-First	A. McGehee Harvey Richard J. Johns Victor A. McKusick Albert H. Owens, Jr. Richard S. Ross	1984

# Contents

	2.9	Cardiac Arrhythmias <i>Thomas Guarneri and Lawrence S.C. Griffith</i>	110
	2.10	Systemic Hypertension <i>Paul K. Whelton and R. Patterson Russell</i>	127
	2.11	Diseases of the Aorta <i>A. Michael Borkon and Vincent L. Gott</i>	144
	2.12	Peripheral Vascular Disease <i>G. Melville Williams</i>	149
<b>SECTION 1: THE APPROACH TO THE PATIENT</b>	<b>1</b>		
1.1	1	Clinical Information and Clinical Problem Solving <i>Richard J. Johns and Nicholas J. Fortuin</i>	
1.2	4	The Collection and Evaluation of Clinical Information <i>Richard J. Johns, Nicholas J. Fortuin, and Paul S. Wheeler</i>	
1.3	22	The Analysis and Synthesis of Clinical Information <i>Richard J. Johns and Nicholas J. Fortuin</i>	
1.4	24	Issues in Diagnostic and Therapeutic Management <i>Richard J. Johns, Nicholas J. Fortuin, and Thomas A. Pearson</i>	
<b>SECTION 2: CARDIOVASCULAR DISEASE</b>	<b>35</b>		
		<i>Section Editors: Nicholas J. Fortuin and Stephen C. Achuff</i>	
2.1	35	Clinical and Laboratory Evaluations of the Cardiovascular System <i>Richard S. Ross and Nicholas J. Fortuin</i>	
2.2	50	Congestive Heart Failure: Pathophysiology, Evaluation, and Approach to Management <i>Kenneth L. Baughman</i>	
2.3	63	Cardiac Murmurs and Other Manifestations of Valvular Heart Disease <i>Nicholas J. Fortuin, Stephen C. Achuff, and Richard S. Ross</i>	
2.4	76	Pericarditis <i>Stephen C. Achuff</i>	
2.5	80	Congenital Heart Disease in the Adult <i>Thomas A. Traill</i>	
2.6	84	Pulmonary Hypertension <i>Thomas A. Traill and John R. Michael</i>	
2.7	88	Thoracic Pain and Angina Pectoris <i>Nicholas J. Fortuin and Gary D. Walford</i>	
2.8	99	Acute Myocardial Infarction <i>Alan D. Guerci and Myron L. Weisfeldt</i>	
		<b>SECTION 3: PULMONARY DISEASE</b>	<b>155</b>
		<i>Section Editor: Peter B. Terry</i>	
	3.1	An Introduction to Respiratory Diseases <i>Peter B. Terry, Wilmot C. Ball, Jr., and Stephen P. Peters</i>	155
	3.2	Localized Pulmonary Infiltration <i>E. James Britt, Robert A. Wise, and J.T. Sylvester</i>	167
	3.3	Mass Lesions and Pulmonary Nodules <i>Stephen R. Selinger, Peter B. Terry, and Ko-Pen Wang</i>	174
	3.4	Pleural Effusions <i>Wilmot C. Ball, Jr.</i>	180
	3.5	Diffuse Pulmonary Infiltration and Fibrosis <i>Carol J. Johns and Sandra M. Walden</i>	183
	3.6	Asthma <i>Eugene R. Blecker and Martin D. Valentine</i>	195
	3.7	Chronic Obstructive Pulmonary Disease and Sleep Apnea Syndromes <i>Gail G. Weinmann, Phillip L. Smith, and Harold A. Menkes</i>	202
	3.8	Pulmonary Thromboembolism <i>William R. Bell</i>	207
		<b>SECTION 4: CRITICAL CARE</b>	<b>213</b>
		<i>Section Editors: M.C. Rogers, J.R. Michael, and J.T. Sylvester</i>	
	4.1	Circulatory and Ventilatory Management of the Critically Ill Patient: General Aspects <i>Peter Rock, William R. Furman, and J.T. Sylvester</i>	213
	4.2	Cardiorespiratory Arrest <i>Nisha Chibber Chandra</i>	221
	4.3	Shock <i>Roy G. Brower, Peter Rock, W. Lowell Maughan, and J.T. Sylvester</i>	226

4.4 Pulmonary Edema <i>Alan D. Guerci and John R. Michael</i>	235	6.5 The Hemoglobinopathies: Inherited Disorders of Hemoglobin Synthesis <i>Samuel Charache</i>	322
4.5 Hypoxic Respiratory Failure: Adult Respiratory Distress Syndrome <i>David B. Pears, E. James Britt, and J. T. Sylvester</i>	239	6.6 The Hemolytic Anemias <i>Thomas S. Kichler</i>	327
4.6 Status Asthmaticus <i>Gail G. Weinmann, Eugene R. Blecher, and John R. Michael</i>	242	6.7 Anemia Associated with Systemic Disease <i>Jerry L. Spinak</i>	332
4.7 Hypercapnic Respiratory Failure <i>Stephen R. Selinger, E. James Britt, and John R. Michael</i>	244	6.8 Bleeding: Hemostasis, Approach to Patient, and Vascular Defects <i>William R. Bell and Dudley P. Jackson</i>	336
4.8 Status Epilepticus <i>Allan Krombholz and Robert S. Fisher</i>	250	6.9 Disorders of Blood Platelets <i>Dudley P. Jackson and William R. Bell</i>	342
4.9 Elevated Intracranial Pressure <i>Daniel F. Hawley, Henry Brem, Hamilton Moses III, and Mark C. Rogers</i>	253	6.10 Disorders of Blood Coagulation <i>William R. Bell and Dudley P. Jackson</i>	347
4.10 Poisoning, Bites, and Stings <i>James J. Lipsky</i>	258	6.11 Bone Marrow Failure <i>Lyle L. Sensenbrenner and Albert H. Owens, Jr.</i>	355
4.11 Hypothermia and Hyperthermia <i>Keith T. Sivertson</i>	263	6.12 Aplastic Anemia and Paroxysmal Nocturnal Hemoglobinuria <i>Lyle L. Sensenbrenner and Albert H. Owens, Jr.</i>	362
<b>SECTION 5: MEDICAL GENETICS</b> <i>Section Editor: Victor A. McKusick</i>	269	6.13 Biology of Human Neoplasia <i>Albert H. Owens, Jr., and Stephen B. Baylin</i>	368
5.1 General Considerations <i>Victor A. McKusick</i>	269	6.14 Principles of Management of Neoplastic Diseases <i>Michael Colvin and Albert H. Owens, Jr.</i>	384
5.2 Chromosomal Aberrations <i>Victor A. McKusick</i>	275	6.15 Disorders of White Blood Cells <i>Albert H. Owens, Jr., and Lyle L. Sensenbrenner</i>	397
5.3 Mendelian Disorders <i>Victor A. McKusick</i>	281	6.16 Neoplastic Diseases of Hematopoiesis <i>Philip J. Burke</i>	404
5.4 Pharmacogenetics <i>Victor A. McKusick</i>	300	6.17 The Myeloid Neoplasms <i>Philip J. Burke</i>	407
5.5 Immunogenetics <i>Victor A. McKusick</i>	301	6.18 The Lymphoid Leukemias <i>Philip J. Burke</i>	415
5.6 Multifactorial Disorders: The Genetics of Common Diseases <i>Victor A. McKusick</i>	303	6.19 The Malignant Lymphomas <i>Albert H. Owens, Jr.</i>	419
<b>SECTION 6: HEMATOLOGIC AND NEOPLASTIC DISEASES</b> <i>Section Editors: Dudley P. Jackson and Albert H. Owens, Jr.</i>	305	6.20 The Plasma Cell Dyscrasias <i>Richard L. Humphrey and Albert H. Owens, Jr.</i>	429
6.1 Hematopoiesis <i>Lyle L. Sensenbrenner</i>	305	6.21 Breast Cancer <i>Martin D. Abeloff</i>	440
6.2 The Anemic Patient <i>Jerry L. Spinak</i>	310	6.22 Lung Cancer <i>Melvin S. Tockman, Wilnot C. Ball, Jr., and Martin D. Abeloff</i>	443
6.3 Iron Deficiency Anemia <i>Jerry L. Spinak</i>	314	6.23 Colorectal Cancer <i>Gordon D. Luk</i>	449
6.4 Megaloblastic Anemia <i>Jerry L. Spinak</i>	318	6.24 Transfusion Medicine <i>Thomas S. Kichler, Paul M. Ness, and Haylen G. Braine</i>	455
		6.25 Anticoagulant and Thrombolytic Therapy <i>William R. Bell</i>	466

**SECTION 7: IMMUNOLOGY***Section Editor: Philip S. Norman*

- 7.1 Adverse Immunologic Responses  
*Philip S. Norman, Elaine L. Alexander,  
Marshall Plaut, and Richard L. Humphrey*
- 7.2 Immunodeficiency Diseases  
*Richard L. Humphrey*
- 7.3 IgE (Anaphylactic) Reactions  
*Philip S. Norman*

**SECTION 8: RHEUMATIC DISEASE***Section Editor: Mary Betty Stevens*

- 8.1 Evaluation of the Patient  
*Mary Betty Stevens*
- 8.2 Systemic Lupus Erythematosus  
*Mary Betty Stevens*
- 8.3 Systemic Vasculitis  
*Mary Betty Stevens and Thomas M. Zisic*
- 8.4 Polymyositis  
*Marc C. Hochberg*
- 8.5 Systemic Sclerosis  
*Frederick M. Wigley*
- 8.6 Sjögren Syndrome  
*Mary Betty Stevens*
- 8.7 Rheumatoid Arthritis  
*Thomas M. Zisic*
- 8.8 Differential Diagnosis of Multisystem Disease  
*Mary Betty Stevens*
- 8.9 Ankylosing Spondylitis and Related Disorders  
*Frank C. Arnett, Jr.*
- 8.10 Gout, Pseudogout, and Microcrystalline Synovitis  
*David S. Newcombe*
- 8.11 Infectious Arthritis  
*Carol M. Ziminski*
- 8.12 Osteoarthritis  
*Marc C. Hochberg*
- 8.13 Differential Diagnosis of Arthritis  
*Mary Betty Stevens*

**SECTION 9: INFECTIOUS DISEASES***Section Editor: John G. Bartlett*

- 9.1 Clinical Management of Patients with Infectious Diseases  
*John G. Bartlett*
- 9.2 Use and Misuse of Antimicrobial Agents  
*Paul S. Lietman*

- 473 9.3 Fevers of Obscure Origin  
*John J. Mann* 566
- 473 9.4 Bacterial Infections of the Skin, Muscle, and Bone  
*John G. Bartlett* 576
- 482 9.5 Upper Respiratory Tract Infections  
*Patrick A. Murphy* 587
- 486 9.6 Pneumonia  
*Patrick A. Murphy* 598
- 491 9.7 Infective Endocarditis  
*John J. Mann* 613
- 491 9.8 Infections of the Gastrointestinal Tract  
*Nathaniel F. Pierce and John G. Bartlett* 619
- 494 9.9 Intra-abdominal Sepsis  
*John G. Bartlett* 625
- 500 9.10 Infections of the Urinary Tract  
*Andrew R. Mayer and B. Frank Polk* 631
- 504 9.11 Infections of the Central Nervous System  
*Diane E. Griffin* 636
- 507 9.12 Systemic Viral Infections  
*John Modlin* 646
- 510 9.13 Fungal Infections  
*John G. Bartlett* 649
- 511 9.14 Sexually Transmitted Diseases  
*Thomas C. Quinn and Bradley Bender* 654
- 517 9.15 Acquired Immunodeficiency Syndrome  
*Cheryl L. Newman and Thomas C. Quinn* 668
- 521 9.16 Geographic Medicine  
*R. Bradley Sack* 677

**SECTION 10: DISORDERS OF WATER AND ELECTROLYTE METABOLISM***Section Editor: W. Gordon Walker*

- 525 10.1 Disturbances of Water and Sodium Metabolism  
*W. Gordon Walker and William E. Mitch* 685
- 530 10.2 Disorders of Potassium Metabolism  
*W. Gordon Walker and Daniel G. Sapor* 697
- 533 10.3 Acid-Base Disturbances  
*Daniel G. Sapor and W. Gordon Walker* 705
- 535 10.4 Water and Electrolyte Derangements in Practice  
*W. Gordon Walker* 715

**SECTION 11: RENAL DISEASES AND DISTURBANCES IN RENAL FUNCTION***Section Editor: W. Gordon Walker*

- 543 11.1 Pathophysiology of Uremia and Clinical Evaluation of Renal Function  
*W. Gordon Walker and William E. Mitch* 723



15.6	Brain Stem Dysfunction <i>David S. Zec</i>	1033	16.5	Affective Disorders and Anxiety Disorders <i>Joseph T. Coyle and John B. Imboden</i>	1124
15.7	Dizziness, Vertigo, and Hearing Loss <i>David S. Zec and Leonard R. Proctor</i>	1039	16.6	Schizophrenia <i>Godfrey Pearlson and Joseph T. Coyle</i>	1130
15.8	Sleep Disorders <i>David Buchholz</i>	1043	16.7	The Cognitively Impaired Patient <i>Marshal Folstein, Barry Rovner, Larry Tune, Andrew Warren, and Jason Brandt</i>	1135
15.9	Headache <i>William G. Speed III and Justin C. McArthur</i>	1046	16.8	Anorexia Nervosa and Bulimia Nervosa <i>Arnold E. Andersen</i>	1141
15.10	Intracranial Masses <i>Henry Brem, Stuart A. Grossman, and Daniel F. Hanley</i>	1052	16.9	Chemical Dependence <i>Donald Jasinski</i>	1144
15.11	Disorders of Movement <i>Mahlon R. DeLong and Hamilton Moses III</i>	1057	16.10	Sexual Disorders <i>Chester W. Schmidt, Jr.</i>	1148
15.12	Parkinsonism and Other Disorders of Extrapyrarnidal Function <i>Hamilton Moses III</i>	1065	1070	SECTION 17: SPECIAL TOPICS IN MEDICINE <i>Section Editor: Richard J. Johns</i>	1155
15.13	Cerebrovascular Disorders <i>Thomas J. Preziosi and Barney J. Stern</i>	1081	17.1	Specific Complications of Medical Management <i>Craig R. Smith and Brent G. Petty</i>	1155
15.14	Weakness <i>Daniel B. Drachman</i>	1085	17.2	Medical Assessment of the Preoperative Patient <i>Brent G. Petty</i>	1162
15.15	Diseases of Muscle <i>Daniel B. Drachman and Hamilton Moses III</i>	1092	17.3	Special Aspects of Care for the Aged <i>William R. Hazzard</i>	1165
15.16	Peripheral Neuropathies <i>John W. Griffin and David R. Cornblath</i>	1096	17.4	Special Aspects of Care for Adolescents <i>Catherine DeAngelis</i>	1173
15.17	Diseases of the Spine and Spinal Cord <i>John Rybock and Hamilton Moses III</i>	1102	17.5	Alcoholism and Associated Medical Problems <i>Mack C. Mitchell and Esteban Mezey</i>	1181
15.18	Multiple Sclerosis and Other Demyelinating Diseases <i>Guy M. McKhann and Justin C. McArthur</i>	1107	17.6	Ophthalmology in Medicine <i>Robert P. Murphy, Neil R. Miller, and Douglas A. Jabs</i>	1187
15.19	Trauma to the Head and Neck <i>Hamilton Moses III</i>	1113	17.7	Cutaneous Medicine <i>Barbara L. Braunstein and Thomas T. Provost</i>	1198
	SECTION 16: PSYCHIATRY <i>Section Editors: John B. Imboden and Joseph T. Coyle</i>	1113		APPENDIX: REFERENCE VALUES FOR LABORATORY PROCEDURES <i>Robert C. Rock and Robert E. Miller</i>	1215
16.1	The Place of Psychiatry in Medicine <i>John B. Imboden and Joseph T. Coyle</i>	1113		Index	1223
16.2	Psychological Reactions to Serious Physical Illness <i>Thomas N. Wise and John B. Imboden</i>	1113			
16.3	Psychiatric Emergencies <i>John B. Imboden and John Chapman Urbatis</i>	1117			
16.4	The Patient with Medically Unexplained Physical Complaints <i>Mark Teitelbaum</i>	1120			



# Section 1

## THE APPROACH TO THE PATIENT

To anyone who has chosen a career in medicine there can be no better motto than to strive to be a person with technical skill, broad scientific knowledge and wisdom, and those personal characteristics of warmth and humility that serve to cement the art with the science of medicine. Such a person exemplifies the inscription on the statue of Edward Livingston Trudeau: "To cure sometimes, to relieve often, to comfort always."

Every student and practitioner of medicine should familiarize himself with the classic essay on *The Care of the Patient*, by Francis Peabody.<sup>1</sup>

*The practice of medicine in its broadest sense includes the whole relationship of the physician with his patient. It is an art, based to an increasing extent on the medical sciences but comprising much that still remains outside the realm of any science. The art of medicine and the science of medicine are not antagonistic but supplementary to each other. There is no more contradiction between the science of medicine and the art of medicine than between the science of aeronautics and the art of flying. Good practice presupposes an understanding of the sciences that contribute to the structure of modern medicine, but it is obvious that sound professional training should include a much broader equipment.*

*The treatment of disease may be entirely impersonal; the care of a patient must be completely personal. The significance of the intimate personal relationship between physician and patient cannot be too strongly emphasized, for in an extraordinarily large number of cases both diagnosis and treatment are directly dependent on it, and failure of the young physician to establish this relationship accounts for much of his ineffectiveness in the care of patients.*

*What is spoken of as a "clinical picture" is not just a photograph of a man sick in bed; it is an impressionistic painting of the patient surrounded by his home, his work, his relations, his friends, his joys, sorrows, hopes, and fears.*

*Thus the physician who attempts to take care of a patient while he neglects those factors that contribute to the emotional life of his patient is as unscientific as the investigator who neglects to control all the conditions that may affect his experiment. The good physician knows his patients through and through, and his knowledge is bought dearly. Time, sympathy, and understanding must be lavishly dispensed, but the reward is to be found in that personal bond which forms the greatest satisfaction of the practice of medicine. One of the essential qualities of the clinician is interest in humanity, for the secret of the care of the patient is in caring for the patient.*

These beautifully expressed thoughts about the physician and his relationship to the patient are even more important today than when they were written over 50 years ago. Medicine has become, and will continue to become, much more a science, not less, so that the physician of tomorrow will have to be more a scientist, not less. Nevertheless, the art of medicine remains, and the physician must continue to be wise and understanding, with a deep respect for the patient as a human being. The secret of success in the care of the patient is still in caring for the patient.

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## CHAPTER 1.1

# Clinical Information and Clinical Problem Solving

Richard J. Johns and Nicholas J. Fortuin

The kind of patient care described in the quotation of Peabody in the introduction is the goal of all conscientious physicians. Although effective patient care is determined by many factors, we shall emphasize two in particular: (1) the quality of the diagnostic management and (2) the quality of therapeutic management. Diagnostic management encompasses all of the steps that lead from the patient's complaints to a clear understanding of the patient's problems. Therapeutic management encompasses all of the measures directed toward correcting or alleviating the patient's problems. Taken together, these aspects are the core of clinical problem solving.

The basic precepts of medical practice cannot be communicated by books alone. Clinical teaching at the patient's bedside is an essential element. As Osler said, "To study medicine without textbooks is to sail an uncharted sea; to study medicine without patients is to not go to sea at all." Many of the aspects of management that are poorly communicated in writing are the very elements Peabody emphasized—the caring, the sensitivity to the pa-

tient's feelings and concerns, the humanistic aspects of medical practice. The fact that these aspects of the practice of medicine often seem neglected in textbooks is in no way intended to deemphasize their importance. It is simply an acknowledgment of a reality: the burden for imparting these precepts falls more heavily on clinical teachers than on textbooks. Wherever such material can be meaningfully rendered into print, we have attempted to include it in this book.

This initial chapter is designed to summarize this process of solving a patient's clinical problem. The subsequent chapters address the process in more detail: the collection and the evaluation of clinical information, the ways in which information is analyzed and synthesized, and the basis of clinical decision making. The final chapter is devoted to the difficult issues in patient management.

### CLINICAL PROBLEM SOLVING

Experienced clinicians appear to approach and solve the problems of their patients with ease. The novice, in contrast, may have difficulty eliciting even the basic information about the patient's problem. This paradox has led some to ascribe this skill in problem solving to "experience," the "art of medicine," clinical "insight,"

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