

MEDICAL REHABILITATION

EDITED BY

John V. Basmajian, M.D.

R. Lee Kirby, M.D.

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John V. Basmajian, M.D., F.A.C.A., F.R.C.P.(C.)

McMaster University and Chedoke Rehabilitation Centre
Chedoke-McMaster Hospitals
Hamilton, Ontario, Canada

R. Lee Kirby, M.D., F.R.C.P.(C.)

Dalhousie University and Nova Scotia Rehabilitation Centre
Halifax, Nova Scotia, Canada



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Accurate indications, adverse reactions, and dosage schedules for drugs are provided in this book, but it is possible that they may change. The reader is urged to review the package information data of the manufacturers of the medications mentioned.

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MEDICAL REHABILITATION

Preface

Medical rehabilitation has grown and changed rapidly in the past two decades. Specialized books now abound on subjects covering a spectrum from electrodiagnosis, through neurological diseases, to musculoskeletal problems, which are useful for teaching residents or for reference. Surprisingly, teachers of medical undergraduates and other health professionals with overlapping interests have not had a suitable textbook which adequately covers medical rehabilitation for nonspecialists. This book attempts to correct that situation.

We, the editors, first agreed that broad and authoritative views were necessary, combined with tight organization of the profuse materials available. To achieve breadth and authority we needed a large number of specialists with a clear idea of our aims. Outstanding leaders in rehabilitation throughout North America and abroad responded generously to our requests for contributions despite tight constraints on content and space necessitated by the intended audience. Our authors deserve all the thanks and praise that we the editors and you the readers can heap on them. The publishers have been very

cooperative and equally enthusiastic; we owe them special thanks, too.

This book should be useful throughout the clinical years of undergraduate education. It is aimed at all medical students, regardless of their subsequent career plans. While we have avoided producing a book for specialists, nevertheless we expect that residents and staffs in physical medicine and rehabilitation, rheumatology, neurology, orthopedics, and plastic and neurological surgery, as well as nonmedical members of the rehabilitation team, will find much of value in these pages.

In such a condensed text, particularly in its first edition, one treads a fine line between excessive terseness and oversimplification, and also runs the risk of omitting important material. We would welcome suggestions from students, teachers, and reviewers as to how this work might be improved.

John V. Basmajian
McMaster University
R. Lee Kirby
Dalhousie University
1983

Contributors

Michael A. Alexander, M.D.

Pediatrician/Physiatrist, Children's Hospital of Pittsburgh, Pittsburgh, Pennsylvania

Thomas P. Anderson, M.D.

Professor of Physical Medicine and Rehabilitation, University of Minnesota Medical School, Minneapolis, Minnesota

Essam A. Awad, M.D., Ph.D.

Clinical Professor of Physical Medicine and Rehabilitation, University of Minnesota Medical School, Minneapolis, Minnesota; Director, Department of Physical Medicine and Rehabilitation, United Hospitals, St. Paul, Minnesota

Sikhar N. Banerjee, M.B., B.S., F.R.C.P.(C.)

Associate Professor of Medicine (Rehabilitation Medicine), McMaster University School of Medicine; Director, Amputee Program, Rehabilitation Centre, Chedoke-McMaster Hospitals, Hamilton, Ontario, Canada

John V. Basmajian, M.D., F.A.C.A., F.R.C.P.(C.)

Professor of Medicine (Rehabilitation Medicine), McMaster University School of Medicine, Director of Rehabilitation Programs, Rehabilitation Centre, Chedoke-McMaster Hospitals, Hamilton, Ontario, Canada

Leonard F. Bender, M.D., M.S.

President and Chief Executive Officer, Rehabilitation Institute; Professor and Chairman, Department of Physical Medicine and Rehabilitation, Wayne State University School of Medicine, Detroit, Michigan

Sheldon Berrol, M.D.

Associate Clinical Professor, University of California, San Francisco; Chief, Rehabilitation Medicine, San Francisco General Hospital, San Francisco, California

Duane S. Bishop, M.D., F.R.C.P.(C.)

Associate Professor of Psychiatry, Brown University; Clinical Director, Butler Hospital, Providence, Rhode Island

Murray E. Brandstater, M.D., Ph.D., F.R.C.P.(C.)

Professor of Medicine (Rehabilitation Medicine), McMaster University School of Medicine; Director, Stroke Program, Rehabilitation Centre, Chedoke-McMaster Hospitals, Hamilton, Ontario, Canada

René Cailliet, M.D.

Professor and Chairman, Department of Rehabilitation Medicine, University of Southern California School of Medicine; Director, Department of Rehabilitation Medicine, Los Angeles County-U.S.C. Medical Center, Los Angeles, California

Jacqueline L. Claus-Walker, Ph.D.

Associate Professor, Department of Rehabilitation and Physiology, Baylor College of Medicine; Director, Neuroendocrine Laboratory, Institute for Rehabilitation and Research, Houston, Texas

Sam C. Colachis, Jr., M.D.

Director, Physical Medicine and Rehabilitation, St. Luke's Hospital Medical Center, Phoenix, Arizona

Sandra S. Cole, A.C.S.E., A.C.S.C.

Departments of Psychiatry and Physical Medicine and Rehabilitation, University of Michigan Medical School, Ann Arbor, Michigan

Theodore M. Cole, M.D.

Professor and Chairman, Department of Physical Medicine and Rehabilitation, University of Michigan and University Hospital, Ann Arbor, Michigan

John Darracott, M.B., B.S., Dip. Phys. Med., F.R.C.P.(C.)

Associate Professor of Medicine (Rehabilitation Medicine), McMaster University, Hamilton, Ontario, Canada

Barbara J. de Lateur

Professor, Department of Rehabilitation Medicine, University of Washington School of Medicine, Seattle, Washington

Steven V. Fisher, M.D.

Assistant Professor, University of Minnesota; Staff Physician, Department of Physical Medicine and Rehabilitation and Consulting Physician, Regional Burn Center, St. Paul-Ramsey Medical Center, St. Paul, Minnesota

Wilbert E. Fordyce, Ph.D.

Professor, Department of Rehabilitation Medicine and Pain Service, School of Medicine, University of Washington, Seattle, Washington

Charles M. Godfrey, M.D., F.R.C.P.(C.)

Professor, Department of Rehabilitation Medicine, University of Toronto Faculty of Medicine; Director of Rehabilitation Medicine, Wellesley Hospital, Toronto, Ontario, Canada

Lauro S. Halstead, M.D.

Associate Professor, Department of Rehabilitation, Community, and Physical Medicine, Baylor College of Medicine; Attending Physician, Institute for Rehabilitation and Research, Houston, Texas

Thomas G. Kantor, M.D.

Professor of Clinical Medicine, New York University School of Medicine, New York, New York

Terence Kavanagh, M.D., Dip. Phys. Med., F.C.C.P., F.R.C.P.(C.)

Medical Director, Toronto Rehabilitation Centre; Associate Professor, Department of Rehabilitation Medicine, University of Toronto Faculty of Medicine, Toronto, Ontario, Canada

Ali A. Khalili, M.D.

Director of Physical Medicine and Rehabilitation, Grant Hospital, Chicago, Illinois

R. Lee Kirby, M.D., F.R.C.P.(C.)

Associate Professor of Medicine (Physical Medicine and Rehabilitation), Dalhousie University, Halifax, Nova Scotia, Canada

George H. Kraft, M.D.

Professor, Department of Rehabilitation Medicine, University of Washington School of Medicine, Seattle, Washington

Janice C. Ledebur, L.P.T.

Department Head of Physical Therapy and Rehabilitation, Geriatrics Center, Philadelphia, Pennsylvania

John Leszczynski, M.B., Ch.B., F.R.C.P.(C.)

Professor and Head, Department of Rehabilitation Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada

D. Duncan Murray, M.D., F.R.C.P.(C.)

Associate Professor and Head, Division of Rehabilitation Medicine, University of British Columbia; Head, Department of Rehabilitation Medicine, Shaughnessy Hospital, Vancouver, British Columbia, Canada

Francis Naso, M.D., F.A.C.P.

Professor of Rehabilitation Medicine and Assistant Professor of Medicine, Thomas Jefferson University; Physiatrist, Department of Rehabilitation Medicine, Thomas Jefferson University Hospital, Philadelphia, Pennsylvania

Farhad Nowroozi, M.D.

Assistant Professor, Physical Medicine and Rehabilitation, University of California, Irvine Medical Center, Orange, California

Don A. Olson, Ph.D.

Director of Education and Training, Rehabilitation Institute of Chicago; Associate Professor, Departments of Neurology and Rehabilitation Medicine, Northwestern University Medical School, Chicago, Illinois

Bernard Posner

Executive Director, President's Committee on Employment of the Handicapped, Washington, D.C.

John B. Redford, M.D.

Professor and Chairman, Department of Rehabilitation Medicine, College of Health Sciences and Hospital, University of Kansas, Kansas City, Kansas

Mary D. Romano, M.S.W.

Assistant Director, Department of Social Work Services, Presbyterian Hospital, New York, New York

Bhagwan T. Shahani, M.D., D. Phil. (Oxon)

Associate Professor, Department of Neurology, Harvard Medical School and Massachusetts General Hospital, Boston, Massachusetts

David G. Simons, M.D.

Clinical Professor, Department of Physical Medicine, University of California, Irvine; Chief, EMG and Electrodiagnostic Section, Veterans' Administration Center, Long Beach, California

Walter C. Stolor, M.D.

Professor, Department of Rehabilitation Medicine, University of Washington School of Medicine, Seattle, Washington

Samuel L. Stover, M.D.

Professor and Chairman, Department of Rehabilitation Medicine, University of Alabama in Birmingham School of Medicine, Birmingham, Alabama

Thomas E. Strax, M.D.

Assistant Medical Director, Moss Rehabilitation Hospital; Associate Professor, Rehabilitation Medicine, Temple University School of Medicine; Consultant, Geriatrics Center, Philadelphia, Pennsylvania

Robert L. Swezey, M.D.

Medical Director, Arthritis and Back Pain Center Inc., Santa Monica, California; Clinical Professor of Medicine, UCLA School of Medicine, Los Angeles, California

Perry S. Tepperman, B.Sc., M.D., F.R.C.P.(C.)

Assistant Professor, Department of Rehabilitation Medicine, Faculty of Medicine, University of Toronto; Staff Physician, Mt. Sinai and Baycrest Hospitals, Toronto, Ontario, Canada

Michael S. Weiss, M.D.

Assistant Professor, Department of Physical Medicine and Rehabilitation, University of Wisconsin, Madison, Wisconsin

David O. Wiechers, M.D.

Assistant Professor, Department of Physical Medicine, Ohio State University, Columbus, Ohio

Philip H. N. Wood, F.R.C.P., F.F.C.M.

Director, Arthritis and Rheumatism, Epidemiology Research Unit, Honorary Reader in Community Medicine, University of Manchester Medical School, Honorary Regional Specialist in Community Medicine, North West Regional Health Authority, Manchester, Great Britain

Konstantinos Yiannikas, M.B., B.S., M.D., F.R.A.C.P.

Fellow in Neurophysiology, Sydney University, Sydney, Australia

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PART ONE

Evaluation

CHAPTER ONE

Introduction

Medical Rehabilitation and the Student

J. V. BASMAJIAN

This introductory chapter is derived to a great extent from the recommendations on undergraduate medical education of the Association of Academic Physiatrists and the American Academy of Physical Medicine and Rehabilitation. Nevertheless, we believe that *all* medical school graduates should be able to assess the problems facing a patient disabled by neuromuscular and musculoskeletal conditions and should be able to provide advice and continuing management in most cases. Some severe conditions may require a complex rehabilitation management team and special facility such as a rehabilitation center. Thus the undergraduate and graduate physician should recognize when the special skills of other members of the rehabilitation team are required and should be prepared to work with such a team to achieve the optimal comfort and independence of patients when they are returned to the home and society. In general, the book illustrates what we believe to be the level of achievement expected of medical graduates at the time of graduation from medical school

insofar as rehabilitation of musculoskeletal and neuromuscular conditions are concerned.

The purpose of this book is to provide an introduction, for all medical students who are either entering or are in the clinical years, to the broad field of medical rehabilitation. It presents, all in one place, the information needed by practitioners to make appropriate decisions in helping patients to deal with neuromuscular, articular, skeletal, and psychosocial needs.

Rehabilitation Medicine (also known as Physical Medicine and Rehabilitation) is a specialty, and its practitioners are called physiatrists (*PHYS-i-a-trists*). Yet, this is not a “how-to” book for becoming a specialist in Rehabilitation Medicine. Rather, it presents the elements that physicians in Family Medicine and other clinical specialties must clearly understand and appreciate. This should make possible the optimal care that they and all members of the health professions must provide for the recovery of patients from chronic conditions and from the postacute stages of acute illnesses and accidents.

Recent surveys have identified Rehabilitation Medicine as one of a small number of specialties in which manpower shortages still exist, with career opportunities in community, office, or hospital-based clinical practice, teaching, and research. Every medical student should acquire a clear idea as to what this specialty entails and should be able to state the scope of its clinical practice, research activities, and the nature and degree of overlap of the specialty with other medical and nonmedical disciplines. This book will help to define these boundaries and interactions. We hope that, as a by-product of this work, a few students go on to become rehabilitation specialists.

KNOWLEDGE

Basic Sciences

The basic sciences of anatomy, physiology, pathology, kinesiology, and ergonomics must form a significant part of the student's intellectual armory. This implies an understanding of both normal and deranged structure and function of the neuromuscular and the musculoskeletal systems and their related functional integration. This includes the functional anatomy of the central nervous and peripheral nervous systems, a reasonable understanding of muscle anatomy and physiology, and the function of the muscles in an integrated fashion. All are important acquisitions in medical school before one can do a satisfactory evaluation and management of physically handicapped patients.

One does not need a detailed knowledge of all of the muscles with their origins and insertions, but one must have a clear understanding of the interplay of muscles in groups as they act across the various joints. In the same way, the detailed knowledge of all of the ligaments around all of the joints can hardly be expected to linger in the memory of most physicians. However, the principles of these structures and a well-planned

methodology for seeking specific information whenever needed are requirements. The more anatomy, physiology, and pathology that a student retains at graduation, the more likely that the result will be better evaluations and better management of patients suffering neuromuscular and musculoskeletal disturbances.

Specific Conditions

Medical students should not graduate without developing a clear understanding of specific neuromuscular and musculoskeletal conditions that are encompassed in the area of medical rehabilitation. These include spinal cord injury, cerebrovascular disease of various types, cerebral palsy, multiple sclerosis, entrapment neuropathies, muscular dystrophy, polymyositis, the various types of arthritis, soft tissue injury, overuse syndromes, scoliosis, peripheral vascular disease, amputations, cardiac diseases, chronic pulmonary diseases, and neurogenic bladder. Related secondary disorders also must be understood, particularly aerobic deconditioning, disuse muscular atrophy, contractures, pressure ulcers, and various types of behavioral and psychological disorders such as grief reactions and depression. The distinctions between impairment resulting from pathology and the consequent disability and handicap should be understood.

Diagnosis and Investigation

The student should acquire a practical ability to approach the neuromuscular disorders through their signs and symptoms (e.g., pain, weakness, paresthesias) and should understand the various techniques that are available for further investigative studies. The physician should be able to select, requisition, or arrange for the various types of laboratory, electrical, or procedural investigations now available, including serum calcium, muscle enzymes, myelography, arthrography, arthroscopy, computerized tomography,

bone scan, electromyography, nerve conduction studies, stress testing of locomotor or cardiopulmonary function, psychometric tests by psychologists, or the results of urodynamic testing by urologists. Before graduation, a student should be able to discuss the indications for, limitations, and methodologies of these investigations, even though the general physician will never actually do any of these tests.

Therapeutic Options

There are a bewildering number of techniques used in rehabilitation. Some of them are easy to understand, but some are really more appropriate for specialists, either physiatrists, surgeons, or allied health professionals (e.g., rehabilitation nurses, physical therapists, occupational therapists, social workers, psychologists, and others). Given a patient with a neuromuscular or musculoskeletal disorder, the physician should be able to select, requisition, or arrange for and monitor the responses to appropriate therapeutic options. These include patient education, special bed-care techniques, therapeutic exercise, orthoses and prostheses, functional aids and appliances, therapeutic heat and cold, anti-inflammatory and neuroactive drugs, surgical joint replacement, methods of re-education, milieu therapy, sexual counseling, and behavior modification. At a minimum, the student should become able to discuss the mode of action of the therapeutic options, their indications, contraindications, complications, and various special considerations. For example, the different considerations include the growing child, the athlete, the pregnant woman, the elderly, and patients with progressive illness.

Problem Lists

The student should acquire the ability to formulate a comprehensive problem list that is medically, functionally, and socioeconomically oriented. An appropriate plan for investigation and manage-

ment of each problem should follow. The student should be able to discuss with reasonable ease the social, economic, vocational, and personal impact of chronic pain and disability on an individual, and on the family, friends, and community.

The Rehabilitation Team

While much of what the physician needs to learn will guide future ability to manage patients at home or in a clinical setting, it is still recognized that the rehabilitation team needs to be called on from time to time. Thus, the student must gain some understanding of the rehabilitation team and its various members. The formal part of the team usually includes a physiatrist, rehabilitation nurse, occupational therapist, physical therapist, speech pathologist, orthotist, prosthetist, vocational counselor, social worker, psychologist, community agencies and organizations, the family physician and, most important, the patient and the patient's family. The role of each will change from case to case, and at different points in a single patient's transition toward independence. Each profession has been trained to acquire special ability, but each also has limitations. It is the collective team approach, especially the well coordinated team, that has the most to offer.

Rehabilitation Literature

The rehabilitation literature is quite broad and sometimes confusing for students. The student should acquire some familiarity with the journals devoted to rehabilitation and should be prepared to follow the changes that occur as part of his or her continuing medical education or to find information relevant to a particular patient's problems. The references in this book have been selected on the above basis.

SKILLS

As part of medical education, the student should become skilled in those areas of human problems normally not seen in

acute general hospital settings. Although students tend to be more impressed by the drama of acute illness and surgery, all around them on the wards of a teaching hospital there are many patients with chronic and subacute disorders and special disorders of the neuromuscular and musculoskeletal systems requiring rehabilitation. Much can be done and learned.

Interview and Physical Examination

Some special skills are required in performing an adequate interview and physical examination of patients with the disorders being considered here. Not the least of the problems is the need of more input from the family of the patient than is normally expected when dealing with acute illness. The interviewer must pay special attention to factors such as residual abilities, functional limitations, limiting factors (e.g., architectural barriers), aids (mechanical and electrical), appliances of various types, such as wheelchairs, and the socioeconomic impact of the problems. While any good physician deals with all of these concerns to some extent, in rehabilitation they become particularly important.

The *physical examination* requires an understanding of how to examine the neuromuscular and musculoskeletal systems and how to evaluate functional abilities. Even in the absence of specific complaints, the student should learn how to perform a screening examination for the early detection of significant remediable disorders (e.g., limb-length discrepancies, scoliosis).

Technical Skills

The student should be able to perform certain basic technical diagnostic tests (e.g., arthrocentesis, lumbar puncture). Certain basic treatment skills also should be acquired, such as the application of a plaster cast or shoulder sling, or intra-articular injections. These are skills that are taught in a variety of departments of a

medical school but are of special importance in medical rehabilitation.

Communication

The student should learn how to make good use of family conferences and team conferences in a manner that optimizes the contributions of each person, including the family and the team members. This requires experience in co-ordination and can only be learned by taking part. Communication with patients, family members, allied health professionals, and physiatrists plays an important part in rehabilitation. The keeping of logical and concise medical rehabilitation records with sufficient information (e.g., range of motion of joints) is important for appropriate monitoring of the patient's progress.

ATTITUDES

Interdisciplinary Functions

Finally, by the time of graduation, the medical graduate should have acquired a special combination of problem-solving inquisitiveness and an empathy and compassion for patients with chronic illness and disability. Rehabilitation requires a patient-centered rather than a disease-oriented medical ethic. A concern for the social, cultural, and economic implications of a patient's disorder must remain paramount in the thinking of all the professional staff's concern for the rehabilitation patient. This implies a respect for and a willingness to work in harmony with other members of the rehabilitation team; again, this can be acquired only by some exposure to the activities of the team, with as much involvement as possible during the training in medical school.

Optimism in Rehabilitation

Rehabilitation is not an overnight phenomenon and requires a special degree of patience in seeking long-term solutions. The student should develop as much en-

thusiasm and eagerness as possible in seeking methods of optimizing residual abilities and in preventing secondary complications. This approach can be as exciting in its own way as work in the emergency room or intensive care unit.

A good principle to remember is that almost all patients with chronic disabilities and with multiple physical distur-

bances can be made significantly better on the basis of the amount of effort put into the treatment by the patient, the family, and the rehabilitation team. The future physician should see the possibilities for becoming a significant member of that team, regardless of whether or not the future includes becoming a part of the specialty of Rehabilitation Medicine.

The Magnitude and Scope of the Problem

P. H. N. WOOD

An epidemiologic appraisal attempts to make a diagnosis of a particular health problem on a community scale. The **three principal components** of such an appraisal are:

- (i) *Perception* of the problem, i.e., recognition of its existence, to which the production of this book attests;
- (ii) *Definition* of the problem and its constituent features, which calls for
 - Specification of the nature of the problem,
 - Identification of associated attributes that characterize the subpopulation at risk, which can serve as the basis for screening and preventive intervention,
 - Examination of the frequency and severity of manifestations of the problem, and of any trends that may be evident,
 - Documentation of the consequences to which the problem gives rise.(It is with these matters that this chapter will deal.)
- (iii) *Review* of the potential for intervention, which is a function of etiology and which has to take account of primary, secondary, and tertiary levels of control, and of the effectiveness and efficiency of such measures; these aspects will be considered elsewhere in this book.

On the basis of such an appraisal it is possible to formulate objectives or strategies for control of the problem, and from these to derive policies (organizational or

administrative responses) in order to attain these ends. An example of strategic guidelines for rehabilitation services has already been published (1).

Diagnosis on this scale tends to be less familiar to physicians, but they should recall Henry Ford's view that a scientific discovery is a fine thing in itself, but it doesn't help the world till its put on a business basis. Inescapably, epidemiologic appraisal is the complement of clinical diagnosis because it indicates the probability of occurrence of various phenomena of relevance, and even more because it is only as a result of such a process that resources are likely to be made available to enable the physician to call on what assistance and support he may need.

DISABLEMENT

At the most fundamental level, disablement reflects the consequences of adverse health experience. The nature of the problems will be considered at greater length in the next chapter, so that for the present purpose it should be sufficient to clarify the different planes of experience to which the data that follow relate. Drawing on work done for the World