

# **Essential Physical Medicine and Rehabilitation**

# Essential Physical Medicine and Rehabilitation

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## Dedication

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*To all medical students and residents of good heart—it's a long journey but, I trust, a good and noble one. I hope this book helps you navigate the path, and makes it a little less arduous.*

—G.C.

## Foreword

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*Essential Physical Medicine and Rehabilitation* is the product of a creative and highly innovative resident, Dr. Grant Cooper. Dr. Cooper realized that our specialty was in need of a basic introductory book geared toward a medical student and junior resident population that would provide the information needed at the start of a physical medicine and rehabilitation (PM&R) rotation. As the title implies, it offers essential concepts and enables residents/students to build the backbone of their PM&R knowledge base and thus maximize their early clinical experience. This book provides a “jump start” so students/residents can begin from a strong and knowledgeable vantage point. The fact that PM&R remains a specialty that may not be easily definable by many medical students ensures even greater value of this book.

What is a physiatrist? What is PM&R? How can one specialty treat both the most physically fit and the most debilitated patients? How can one specialist treat both the youngest infants and the oldest patients? How can one specialty demand knowledge of nearly every organ system? Why would a physician need to know so much about so many aspects of a patient’s lifestyle and environment? The answers to these questions lie in the core principles of our field.

Our expertise is in maximizing functional independence in patients with disability. The common denominator of our patient population is “loss of function.” A physiatrist uses a wide array of interventions to rehabilitate their patients including, but not limited to, exercise, physical modalities (cold, heat, electrical stimulation), external devices (braces, artificial limbs), gait aids, assistive devices for activities of daily living, communication aids, seating and mobility systems, counseling, and specialized techniques (injection, manipulation, traction, and massage).

PM&R is a goal-oriented specialty that involves many health professionals. The physiatrist leads the team, which may include any or all of the following members: physical therapist, occupational therapist, speech therapist, recreational therapist, prosthetist, orthotist, rehabilitation nurse, vocational counselor, social worker, and rehabilitation engineer. Additionally, we may work closely with

school staff, employers, architectural staff, insurance companies, or other individuals who may affect the patient's functional gains and achievement of independence.

As you read through *Essential Physical Medicine and Rehabilitation* and are introduced to core areas of our field, think like a physiatrist: ask yourself, "What is the functional limitation and how can I aid the patient in overcoming that limitation?" A common thread binds these diverse chapters, just as a common thread binds the diverse areas of our specialty. The common thread is functional disability. The common goal is to maximize functional independence.

In Chapters 1 and 2, we learn that the spectrum of brain injury includes minimal subtle findings to severe cognitive dysfunction. Identifying the deficits is critical in formulating a rehabilitation plan because even minimal changes in memory and concentration may have devastating effects on daily life functions. In Chapter 3, we see that spinal cord injury can affect nearly every organ system and serves as a model condition to demonstrate the principles of our specialty. Orthotics and prosthetics are described in Chapter 4 and demonstrate how the use of an external support or artificial limb can improve safety, stability, cosmesis, mobility, independence, and overall function. Chapters 5 and 6 discuss rehabilitation of the cardiac and pulmonary systems and reinforce the principle that without efficient cardiopulmonary function, endurance, conditioning, and exercise capacity are greatly limited. Chapter 7 introduces pediatric rehabilitation and suggests that when the developing body is affected with an insult, the body may learn early compensations and adaptations. Neuromuscular rehabilitation is described in Chapter 8 and refers to interventions used for disability that results from either acquired or inherited disorders of the anterior horn cell, peripheral nerve, neuromuscular junction, or muscle, which may lead to impairments of strength, sensation, and/or muscle tone. Cancer rehabilitation is discussed in Chapter 9. Malignancy can affect any part of the body, by direct invasion, associated pathology, or the effect of treatment. Chapters 10 and 11 describe orthopedic rehabilitation and spine and musculoskeletal medicine, respectively. These chapters demonstrate that we require intact structure (bones, joints, tendons, ligaments, and muscles) for correct posture, movement, and locomotion. Additionally, painful soft tissue disorders can be functionally limiting. Electrodiagnostic medicine, discussed in Chapter 12, is a diagnostic tool that

physicians use to help localize a lesion of the neuromuscular system, determine severity of the lesion, as well as time course and prognosis.

PM&R is a diverse medical specialty based on teamwork, optimism, creativity, and confidence in our patients. Overcoming disability and maximizing function are among the most rewarding values that medicine has to offer. The field of PM&R is at the forefront of this goal.

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## Preface

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When I was a medical student interested in physical medicine and rehabilitation (PM&R), I found several excellent detailed texts for PM&R and I also encountered a few good, quick reference materials. What I felt was lacking was a comprehensive but high-yield, focused review of the most important points that I could read before and during my rotation. As a junior resident in PM&R, I again encountered the same frustration. What I was looking for was a book that would slice through the minutiae and offer me the critical information that I would need to know during a PM&R clinical rotation. Such high-yield review texts exist in other fields and I was never quite sure why they did not exist for ours. I suppose it is in part because we are a relatively young and small specialty. Additionally, the breadth and scope of our field, from treating the most debilitated patients to professional athletes, might seem daunting at first glance. And yet, as Dr. Strauss has eloquently laid out in her foreword to this book, there is a unifying theme of function that pervades the diverse aspects of our field.

In *Essential Physical Medicine and Rehabilitation*, I have aimed to create the book that I had sought as a medical student and junior resident. Each chapter is written by recognized experts and educators in their respective fields. Each chapter is written as though telling a medical student or junior resident, in concise terms, everything he or she should know before—and during—a first rotation in the given subspecialty. I believe this book accomplishes that goal. I hope you will agree.

*Grant Cooper, MD*

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*Essential Physical Medicine and Rehabilitation* is a wonderful example of a true collaborative effort. It is a pleasure and a privilege for me to take a moment and acknowledge some of the people who helped make it possible. Humana Press and its Editor of Life and Biomedical Sciences, Don Odom, have been a pleasure to work with. Don's drive and commitment to excellence is inspiring. I would like to also extend a special thank you to Dr. Nancy E. Strauss and Dr. Michael O'Dell for their help and encouragement. Finally, this book would not have been possible without the hard work of its many distinguished authors who believed in the need for it.

—G.C.

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