
HEART DISEASE AND REHABILITATION

second edition

edited by

MICHAEL L. POLLOCK, PhD

DONALD H. SCHMIDT, MD

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with a foreword by

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Foreword

During the 1970s, extensive investigations have placed special focus on the difficult problem of coronary artery disease. Coronary risk factors have been delineated for primary and secondary prophylaxis; adult physical fitness programs have improved secondary prophylaxis; adult physical fitness programs have improved cardiorespiratory health; comprehensive rehabilitation programs have restored functional status in clinical cardiovascular disorders; more efficacious drugs have been introduced for the treatment of angina pectoris; the coronary care unit has reduced hospital deaths in acute myocardial infarction; low-risk coronary bypass graft surgery for obstructed arteries has relieved ischemic pain, reduced infarction rate and hazard, and extended longevity; and potentially effective antiarrhythmic modalities are now being employed and evaluated in the prevention of sudden coronary death.

In this same time period, the expansion of modern cardiology has also comprised the development of sophisticated noninvasive methods, especially the accurate cardiovascular imaging techniques of echocardiography and nuclear cardiology, which complement and in some instances obviate the need for invasive methods in the detection and quantification of cardiovascular diseases and function.

The application of recently devised symptomatic treatments, preventive measures, and evaluation modalities has become widespread as a result of enhanced professional health care delivery and public education campaigns, and these significant developments have exerted a salutary impact on improving the health of Americans. Thus, while heart and vascular diseases remain the leading causes of death in this country, the latest mortality statistics are encouraging. For example,

the National Center for Health Statistics has revealed that for the first time in the 1970s the number of deaths from cardiovascular diseases dropped to below one million in 1975, despite a steadily increasing and aging population. Furthermore, since the 1950s, the death rate from heart and vascular diseases has been reduced by 30%, with the most dramatic improvement (15% decline) occurring since about 1974. Moreover, it is clear that diminishing cardiovascular mortality constitutes the principal responsible determinant for the lowest overall mortality rate in United States history.

Despite the impressive inroads achieved to date, cardiovascular diseases still account for more deaths (49% of annual national mortality) than all other causes combined. These alarming observations underscore the grave nature and enormous scope of cardiovascular diseases, which constitute our leading health problem nationally and worldwide, in terms of both mortality and morbidity (43 million Americans today have overt cardiovascular disorders). The various complications of atherosclerosis produce more than four-fifths (755,100 deaths annually) of all cardiovascular mortality. Coronary artery disease represents the largest cause of death, being responsible for more than one-third (559,000 deaths each year) of all national mortality.

One of the most impressive gains in the management of patients with cardiovascular disorders during the past decade has been the valid establishment and incorporation of the innovative rehabilitative approach into the mainstream of contemporary medical care. While it is recognized that postoperative cardiac patients and patients with clinically overt coronary atherosclerosis and other types of cardiovascular disorders require the extensive spectrum of rehabilitative services, the most productive means of delineating the value of a comprehensive cardiac rehabilitation program is to consider the various aspects of coronary heart disease—the principal focus employed so successfully in this book. Further, there is considerable overlap between problems and practices related to rehabilitation in other forms of cardiovascular disease. Cardiovascular rehabilitation is broadly defined as encompassing the measures for the cardiac patient that restore and maintain optimal physiologic, psychologic, social, educational, and vocational status. Implicit in this definition is the inclusion of modalities designed to prevent, retard, and assess progression of the disease process.

Dr. Pollock and Dr. Schmidt, the editors of this authoritative volume, are to be greatly commended for their highly informative and comprehensive presentation. They have judiciously synthesized outstanding chapters on epidemiology, prevention, pathophysiology, diagnosis, evaluation, risk factor intervention, and medical and surgical therapy of heart disease, together with chapters on exercise testing, exercise training, organization of rehabilitation programs, special aspects of rehabilitation, work physiology, and results of physical fitness and exercise rehabilitation programs, all of which are contributed by the foremost world experts in the discipline. This superb volume uniquely succeeds in providing the most recent basic and clinical progress and current status of modern knowledge concerning the principles, concepts, procedures, practice, and role of the multifaceted subject of cardiovascular rehabilitation important in the advancement of contemporary care of the patient with heart disease. This practical sourcebook is addressed to a wide clinically oriented audience of professionals in medicine, including cardiologists, internists, generalists, physicians-in-

training, and medical students, as well as physiologists, physical educators, exercise therapists and nurse supervisors, postgraduate students in the medical sciences, and academic investigators in the basic and clinical areas.

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Preface to the Second Edition

The second edition to *Heart Disease and Rehabilitation* includes a major updating and revision of chapters. This comprehensive volume has also been improved with the addition of six new chapters. Chapter 13, "Factors Influencing the Recommendation for Medical Versus Surgical Therapy in Patients with Atherosclerotic Coronary Artery Disease" by Nanette K. Wenger, MD, includes the latest information on both American and European trials regarding the efficiency of coronary artery bypass graft surgery. Chapter 18, "Exercise in the Primary Prevention of Coronary Heart Disease" by Ralph S. Paffenbarger, Jr., MD; Chapter 29, "Exercise for the Diabetic Patient" by Carl Foster, PhD, and coworkers; Chapter 31, "Drug Effects: Exercise Testing and Training" by David T. Lowenthal, MD, and Daniel T. Stein, MD; and Chapter 34, "Returning the Patient to Work" by Dorothy Knapp, PhD, and coworkers have new state of the art information. The Israeli experience in cardiac rehabilitation is full of tradition and scientific inquiry, thus, the addition of Chapter 26, "Cardiac Rehabilitation: the Israeli Experience" by Jan J. Kellermann, MD, is significant.

The *update* includes the latest information on the clinical assessment of coronary heart disease (CHD), the assessment of risk factors associated with the development of CHD, and the effect of risk factor modification on both primary and secondary prevention of CHD. This second edition summarizes the latest findings from the Framingham Heart Study and includes information on recently completed intervention trials. The *update* also includes the latest information on exercise testing and prescription and the management of cardiac patients through their various stages of recovery.

Since 1979, when the first edition of *Heart Disease and Rehabilitation* was

published, the field of cardiac rehabilitation has been further defined and developed. This has been shown by the rapid growth and establishment of cardiac rehabilitation programs that are staffed by highly qualified multidisciplinary professionals. Cardiac rehabilitation includes more than just exercise, but a comprehensive plan of rehabilitation individualized for the patient's specific needs.

The field of cardiac rehabilitation has continued to be fostered by the efforts of the American Heart Association and the American College of Sports Medicine. Since the first edition, two distinct important events have further stimulated the field. First, in 1981, a new forum, the *Journal of Cardiac Rehabilitation*, was introduced. This publication, in its fifth year, is a scientific journal that incorporates both investigative and clinical aspects of cardiac rehabilitation. Second, the American Association of Cardiopulmonary Rehabilitation was established in the summer of 1985. The second edition of *Heart Disease and Rehabilitation* is an attempt to keep abreast of the rapidly expanding field and provide physicians and health professionals with an up-to-date, comprehensive, state-of-the-art text.

MICHAEL L. POLLOCK, PhD
DONALD H. SCHMIDT, MD

Preface to the First Edition

In 1972, at the Airlie Conference Center near Warrenton, Virginia, a post-graduate course entitled "Physiology and Psychology of Exercise Testing and Training of Coronary Disease Patients and Coronary-Prone Subjects: Principles, Techniques, Applications and Effects" was presented. The concept of the course was to bring together experts in the field with the latest information for assimilation and distribution. Since 1972, the increasing emphasis throughout the world in preventive and rehabilitative medicine has stimulated research and, thus, the body of knowledge has increased greatly. We have, for example, had the opportunity to more thoroughly analyze the findings of many population studies, such as the ones conducted at Framingham, Massachusetts, Tecumseh, Michigan, and Evans County, Georgia; intervention studies, such as the Multiple Risk Factor Intervention Trial and National Exercise and Heart Disease Project, have gotten underway; new diagnostic tools for the diagnosis of coronary heart disease, including two-dimensional echocardiography and the use of radionuclide scintigraphy and angiography, have been further developed; studies regarding the medical and surgical management of coronary heart disease patients have been reported; and the results of many rehabilitative programs for both medical and surgical cardiovascular disease patients have been published.

To update and disseminate these more recent findings, a symposium entitled "Heart Disease and Rehabilitation: State of the Art" was organized by Mount Sinai Medical Center in Milwaukee, Wisconsin, and sponsored in cooperation with the University of Wisconsin, Madison, School of Medicine; the American

Heart Association/Wisconsin Affiliate; the University of Wisconsin, Milwaukee; and the Department of Continuing Medical Education Health Services Unit—University of Wisconsin Extension. This symposium constituted the genesis of this book, for it was during the symposium that the need for an authoritative and comprehensive source on heart disease and rehabilitation became clearly apparent.

Since that time we and the contributing authors have been working to provide the most current and comprehensive book on heart disease and rehabilitation. Each of the following chapters was carefully written and developed for publication with this aim in mind. The eight-part structure of the book reflects our goal of a comprehensive but clearly focused approach. Similarly, the currency of this volume is reflected by both the agreement and disagreement among the contributing authors. Indeed, the reader will discover a number of controversies. The effect exercise has on morbidity, mortality, and risk, the virtues of medical versus surgical management of the coronary patient, the manner in which exercise should be prescribed, monitored, and supervised, and the procedures by which graded exercise testing should be performed and evaluated are only a few of these controversial issues. Also, because of its extensiveness, this book sometimes raises more questions than it answers, thus whetting our appetite for future inquiry and research.

It is impossible to acknowledge the many individuals whose advice and help made our task considerably easier than it might have been. We must, however, thank Alan Daniel, MD, Medical Director of the Cardiac Rehabilitation Program at Mount Sinai Medical Center, and Dudley Johnson, MD, Chief of Cardiovascular Surgery at the same institution; our special thanks to Carl Foster, PhD; Sue Brossman; Wendy Faraher, RN; Margaret Krentz; Ann Ward; Ann Bailey; Ward Gates, PhD; Bernie Janz; and Ron Nelson for their considerable assistance. We are also grateful to the faculty whose enthusiastic and scholarly participation made this text possible, and to the administration of the Mount Sinai Medical Center and the Cardiovascular Life Sciences Program and Department of Medicine (Mount Sinai) for their leadership, encouragement, and support of both the symposium and the book. It is our hope that this volume rewards their support and encouragement by accomplishing our original goals and objectives and by truly representing the state of the art.

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