Cardiac Rehabilitation
Contemporary Cardiology

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Cardiac Rehabilitation

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This volume is dedicated to Andrew G. Wallace, who as Division Chief of Duke Cardiology pioneered cardiac rehabilitation nationally and at Duke in the late 1970s, shepherding it through the early days of coverage by national insurance carriers; and to Frederick R. Cobb, who spent the last 15 years of his abruptly shortened but distinguished career dedicated to the secondary cardiovascular prevention principles that underlie modern cardiac rehabilitation. Finally, this volume is also dedicated to Sidney Goldstein, who, as Chief of Cardiovascular Medicine at Henry Ford Hospital, both appreciated and advanced the use of randomized clinical trials to evaluate a variety of secondary prevention strategies in patients with heart disease; treatment strategies that included risk factor management and exercise training.
The era of cardiac rehabilitation in the United States dates back at least thirty years, when Herman Hellerstein at Case Western Reserve, Andy Wallace at Duke and Ken Cooper in Dallas envisioned that a comprehensive lifestyle approach to the rehabilitation and prevention of patients having had a cardiac event would potentially yield great benefits for the individual patient and the health care system. Until that time, the thought of vigorous exercise in the cardiac patient soon after an event was close to anathema. One of us (WEK) was introduced to Herman Hellerstein in Cleveland in the late 1960’s, when his father sought medical opinion from him for a cardiac condition. WEK was introduced to Andy Wallace in 1979 by which time the latter had started a multidisciplinary, geographically regional cardiac rehabilitation program at Duke based upon consultations with Hellerstein and Cooper. By then, cardiac rehabilitation was progressing beyond the vision of exercise only, and since then the concept of cardiac rehabilitation has grown into the comprehensive multidisciplinary program that we know today and that we attempt to describe in this volume.

The practice of cardiac rehabilitation has grown and metamorphosed in the last thirty years in parallel with the growth and metamorphosis of the practice of cardiovascular medicine. During the formative stages of cardiac rehabilitation, the use of coronary care units was in its infancy. The coronary artery bypass operation was less than ten years old. The LIMA bypass had not been invented. There were no statins and the use of angiotensin converting enzyme inhibitors was just beginning. And of course, angioplasty was just a twinkle in the eye of forward looking pioneers in cardiovascular medicine. Thus, the modern practice of both cardiac rehabilitation and cardiovascular medicine represent new realities that are ever evolving. As an example, just last year, in 2006, the Center for Medicare and Medicaid Services (CMS), approved three new indications for cardiac rehabilitation reimbursement (Percutaneous Coronary Intervention-PCI, cardiac transplantation and valvular surgery) to accompany the previous three indications of chronic stable angina, post bypass and post myocardial infarction. More importantly and significantly, CMS recognized cardiac rehabilitation as the truly multidisciplinary program that it is – beyond just exercise therapy for the cardiac patient. And, as this text is in development, the American Association of Cardiovascular and Pulmonary Rehabilitation, the American Heart Association and the American College of Cardiology are combining efforts to publish the first set of performance measures for referral to and delivery of Cardiac Rehabilitation.

To reflect this new reality, we are pleased to have developed this volume. However, this text is not meant as a comprehensive compendium of the history and medical literature supporting the medical practice of cardiac rehabilitation. Rather, such overviews are available in other texts and in Cochrane reviews. Rather, we have specifically designed this as a practical manual for those newly introduced to the specialty, such as ancillary health personnel or cardiology fellows, or for established cardiologists wishing to begin a program in their practice or assuming the role as Medical Director.
of established programs. We trust that it will serve this purpose well. The text is divided into several sections.

After an Introduction and Overview by the editors (Kraus and Keteyian) and a brief introduction to Exercise Principles, we delve into the essential components of a comprehensive cardiac rehabilitation program. In a section devoted to nutrition, Gene Erb and Julie Pruitt discuss the use of contemporary diets in cardiac rehabilitation and Joh Ehrman discusses the approach to obesity.

Assessment of psychological state and supporting behavior and lifestyle change, whether in nutrition, exercise, smoking cessation or stress and anger management is an essential component of a comprehensive cardiac rehabilitation program. In a section on behavioral aspects of cardiac rehabilitation, Krista Barbour discusses the approaches to depression, and Ruth Quillian-Wolever the approach to stress management. Readiness for Change theory, or the Transtheoretical Model is used a basis for behavior change in multiple venues and Charlotte Collins presents this paradigm for treatment. Last in this section, Jennifer Davis presents the essential approach to smoking cessation.

Exercise Testing is used for prognostication, diagnosis and assessment of exercise capacity and therapeutic progress in the cardiac rehabilitation setting. In this section Bill Kraus presents the basis and uses of exercise testing and Clinton Brawner presents the essential of performing and interpreting the exercise stress test. Dan Bensimhon describes the indications, performance standards and interpretation of the cardiopulmonary exercise test and Vera Bittner does the same for the six minute walk test.

Medical therapy is a mainstay of the comprehensive cardiac rehabilitation program. Treating to goal has become a standard of cardiac post event and prevention programs. As the medical therapy for cardiac often cannot be optimized during their hospital admission, the outpatient cardiac rehabilitation setting when one patient can be seen up to 36 times over the course of three months has become an optimal setting to titrate medical therapies to goal. In this section, Christie Ballantyne and Ryan Neal describe treating lipids to goal in the cardiac rehabilitation setting. Neil Gordon does the same for diabetes mellitus and hypertension.

In a section unto its own, John Schaier and Steven Keteyian describe the various Cardiac Populations for which cardiac rehabilitation is typically prescribed and the vagaries of exercise therapy in these settings. Coronary artery disease is a disease that often presents in the setting of other co-morbid conditions that may require significant modifications of the standard therapeutic approaches. In this section on exercise and co-morbidities, Dalynn Badenhop addresses hypertension and Jennifer Green offers what one needs to know about diabetes mellitus. Neil Macintyre, a well known expert in pulmonary rehabilitation, addresses the needs of the pulmonary patient with cardiac disease. Chris Womack discusses the special needs of the patient in cardiac rehabilitation that has peripheral artery disease. Kim Huffman discusses the issues associated with the cardiac rehabilitation patient with associated arthritis and Dan Forman discusses the challenges and approaches for the elderly patient.

One of the particularly satisfying part of being involved in cardiac rehabilitation is the programmatic advances that have taken place over the course of the last thirty years. When cardiac rehabilitation first started, there was no reimbursement for services. Now, the Program and Medical Directors require broad knowledge regarding several dimensions about running a program, including how to handle referrals, the physicians
role, and billing and reimbursement. In this Programmatic section we address these issues. Linda Hall discusses soliciting and handling programmatic referrals. Phil Ades addresses the physician Medical Director’s role. Bill Kraus presents an innovative way to provide programmatic assessment and treatment of risk in the cardiac rehabilitation and associated clinic setting. Greg Lawson presents the various staffing models and Pat Comoss discusses billing and reimbursement.

We are pleased to present to you, the interested reader, what we hope will be a useful and thorough overview of the component elements of state of the art cardiac rehabilitation. We trust that the new initiate to cardiac rehabilitation will find useful information. To facilitate communication and quick reference, many of the chapters have highlighted summary tables of important information. We hope that even seasoned veterans will find some innovative hints on how to improve their programs. And we welcome feedback from the reader on how we can make this effort better as we all participate in the coming future evolution of cardiac rehabilitation in the 21st century.

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