
Cardiorespiratory Fitness in Cardiometabolic Diseases

Peter Kokkinos • Puneet Narayan
Editors

Cardiorespiratory Fitness in Cardiometabolic Diseases

Prevention and Management
in Clinical Practice

 Springer

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This book is dedicated to Evangeline, spouse, friend, and mother, and to my sons Nicholas and John Peter, who make life a wonderful journey!

Peter Kokkinos

This book is dedicated to my Parents for instilling us with their values of hard work, dedication and sacrifice with endless support and love.

Puneet Narayan

Preface

Physical activity is the most underutilized medical intervention in prevention and management of cardiovascular disease. This despite the fact that it is inexpensive, relatively low risk, and easily incorporated in most lifestyles. The link between physical activity and health was recognized by Hippocrates in the fifth century BC. Hippocrates stated that a sedentary lifestyle renders the body liable to disease and premature aging. Conversely, moderate physical activity promotes health and slows the aging process. Scientific scrutiny of this concept began in the early 1950s with the landmark work of Morris and coworkers reporting that mortality rates were approximately 50% lower in civil servants with jobs requiring more physical activity versus those serving in more sedentary positions. For more than half a century now, a plethora of evidence has accumulated from large, long-term epidemiological studies that support a strong, inverse, and independent association between physical activity, cardiorespiratory fitness, and cardiovascular and overall mortality in apparently healthy individuals and in patients with documented chronic disease. In addition, similar associations have been observed between incidence of chronic disease and fitness.

The exercise-related health benefits are related in part to favorable modulations in both the traditional and novel cardiovascular risk factors that have been observed with increased physical activity patterns or structured exercise programs. The primary reason for this protection is the innate capacity of the body to adapt to an imposed demand. Specifically, the increased energy requirements during physical activity (work) place a greater demand on all biological systems involved to meet this demand. Consequently, acute changes occur to meet the increased metabolic demand. Moreover, if the demand (exercise) is adequate and chronic (over several weeks), the adaptations made are also chronic and designed to make the systems involved in the task more efficient and, ultimately, more resilient to injury and disease. Specific mechanisms modulating these adaptations and the protection against disease and death have also been defined in recent years.

The overwhelming evidence on the link between cardiorespiratory fitness, chronic diseases, and mortality risk has shifted attention of the medical profession to seriously consider fitness status as part of the patient's medical profile and to encourage patients to increase their daily physical activity.

Accordingly, this book provides a comprehensive overview on exercise-related cellular, cardiovascular, and metabolic chronic adaptations in healthy and diseased populations and, in addition, an extensive review of the literature on the preventive and therapeutic aspects of physical activity, exercise, and cardiorespiratory fitness on cardiovascular risk factors and cardiometabolic diseases.

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