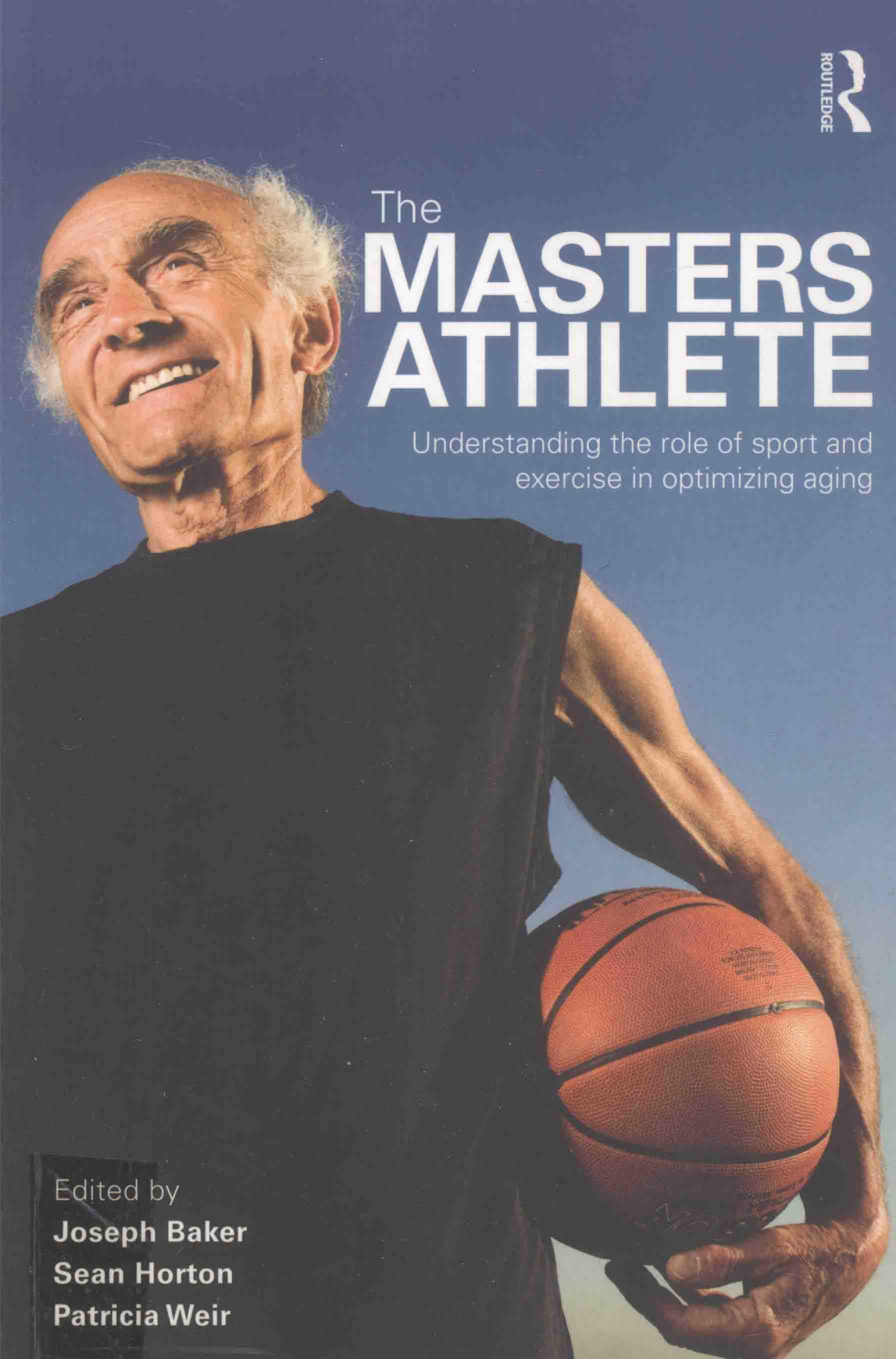
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The
MASTERS
ATHLETE
Understanding the role of sport and exercise in optimizing aging
Edited by
Joseph Baker
Sean Horton
Patricia Weir

THE MASTERS ATHLETE

UNDERSTANDING THE ROLE OF SPORT AND EXERCISE IN OPTIMIZING AGING

EDITED BY JOSEPH BAKER, SEAN HORTON, AND PATRICIA WEIR

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Father Time is not always a hard parent, and, though he tarries for none of his children, often lays his hand lightly upon those who have used him well; making them old men and women inexorably enough, but leaving their hearts and spirits young and in full vigor.

Charles Dickens, *Barnaby Rudge*

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PREFACE

The benefits of lifelong involvement in physical activity are well known. They include decreased risk of cardiovascular disease, hypertension, and diabetes (Katzmarzyk et al., 2003), as well as increased physical and mental health (Mazzeo et al., 1998). Despite these benefits, rates of physical activity typically decline with advancing age. Investigations of physical activity involvement across the lifespan show a trend toward peak involvement during early to mid adolescence, followed by decreasing involvement from that point forward (Crocker & Faulkner, 1999; De Knop et al., 1996).

This pattern has important long-term effects. Indeed, much of the decline in physical and cognitive abilities with advancing age is thought to be the result of disuse rather than age per se (Maharam et al., 1999). Studies of cognitive and motor skills, such as chess (Charness, 1981) and typing (Salthouse, 1984), as well as physiological capacities, such as maximal strength (Tarpenning et al., 2004), suggest performance can be maintained at high levels in spite of advancing age, provided there is continued involvement in the activity. As a result, the lack of physical activity in older adults has been identified as a primary contributor to decreases in functional capacity and increases in morbidity and mortality (DiPietro, 2001).

One group that deviates from the typical profile of aging and the corresponding decline in physical activity levels is Masters Athletes. These athletes typically maintain higher-than-average levels of physical activity throughout the lifespan (Hawkins et al., 2003) and are unique because they continue to physically train and compete well into old age. Compare this with Canadian statistics that show, by the age of 50, only one in ten individuals is motivated to be involved in sport activities at least once per week (Sport Canada, 2003). Continued involvement in sports has its benefits. Sport scientists (e.g., Starkes et al., 1999) have suggested that prolonged training by Master Athletes plays a critical role

in the maintenance of athletic performance even in the face of predicted age-related decline. The physiological changes that occur with age are well documented — age changes for maximal heart rate (Hagberg et al., 1985) and aerobic capacities (Eskurza et al., 2002; Hawkins et al., 2001; Pimentel et al., 2003) are significant. Yet age-related physiological decline is not as severe in Masters Athletes.

The number of older athletes is greater than ever before, and all of the evidence to date illustrates that Masters Athletes are the physical elite and 'best preserved' of their age cohorts. As a result, some (Hawkins et al., 2003) have suggested they represent a model of 'successful' aging, and researchers have begun utilizing this population to examine a host of issues relative to aging, physical/cognitive functioning, and health.

This book brings together leading researchers from around the world to discuss the most recent research and its intriguing implications for both aging athletes and the population as a whole. In addition, the authors have identified areas that require further inquiry — research questions that will form the basis for future work with this important population. In general, this text is divided into four sections. Section One provides a summary of some of the most pertinent issues in the field (Chapter 1) and the statistical methods used to evaluate age-related declines in performance (Chapter 2). Section Two summarizes research on the effect of aging on muscle recovery from exercise (Chapter 3) and cardio-respiratory adaptations with age (Chapter 4). Chapter 5 summarizes research showing a high degree of performance maintenance in highly skilled groups, and Chapter 6 considers how age affects recovery from training stress (among other things). Section Three focuses on psychosocial issues in Masters sport, covering topics ranging from the development and maintenance of motivation (Chapter 7) to the role that Masters Athletes play in challenging some of the negative stereotypes of aging that exist in society (Chapter 8), and how Masters sport might assist an individual's navigation through the aging process (Chapter 9). In Section Four, the book considers some of the larger issues in public health. Chapter 10 examines Masters Athletes as they relate to theories of 'successful aging', while Chapter 11 examines the epidemiology of injury in this population. Finally, Chapter 12 provides a critique of the book with specific attention to limitations in current knowledge and key directions for future work.

Perhaps the greatest advantage of a book of this nature is the possibility for cross-fertilization of ideas between researchers from different domains. This text summarizes current research from the fields of medicine, physiology, motor behavior, psychology, and gerontology, and reinforces the value of Masters Athletes as a research population for examining issues related to optimal and

successful aging. Considering the demographic trends in many industrialized countries of the world, more attention to the issue of healthy and successful aging is clearly warranted.

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SECTION ONE

INTRODUCTION TO MASTERS SPORT AND THE STUDY OF OLDER ATHLETES

CHAPTER ONE

THE EMERGENCE OF MASTERS SPORT

Participatory trends and historical developments

PATRICIA WEIR, JOSEPH BAKER, AND SEAN HORTON

> We are aging — not just as individuals or communities but as a world. In 2006, almost 500 million people worldwide were 65 and older. By 2030, that total is projected to increase to 1 billion — one in every eight of the earth's inhabitants. Significantly, the rapid increases in the 65-and-older population are occurring in developing countries, which will see a jump of 140 percent by 2030.
>
> US Department of State, April 2007

Global population aging is a function of two factors: decreased fertility rates and improvements in health and longevity. Until the mid-1960s, the fertility rate in Canada was equal to three children or more per woman. Since that time, the fertility rate has experienced a rapid decline, sitting below the rate for natural replacement of the population for the last 30 years (Health Canada, 2002). Similar trends exist in many westernized countries, and, most surprisingly, this trend is seen in 44 per cent of less developed nations. The demographics of the global population will continue to change. The United Nations estimates that in 2017, the percentage of the population over 65 years of age will exceed the percentage of the population under five years of age, a shift that is expected to continue for many decades to come (United Nations, 2005).

In Canada, as the baby boomers (those born between 1946 and 1964) age, the population of seniors is expected to grow to 6.7 million in 2021 and 9.2 million in 2041. By 2041, one in four Canadians will be a senior. Over the next four decades, the growth of the senior population will account for almost half the population growth in Canada (Health Canada, 2002). In Canada, and around the world, the fastest growing segment of the older population is the 'oldest-old', or seniors aged 85+ years. Currently the oldest-old make up seven per cent of the world's population over 65 years. More developed countries