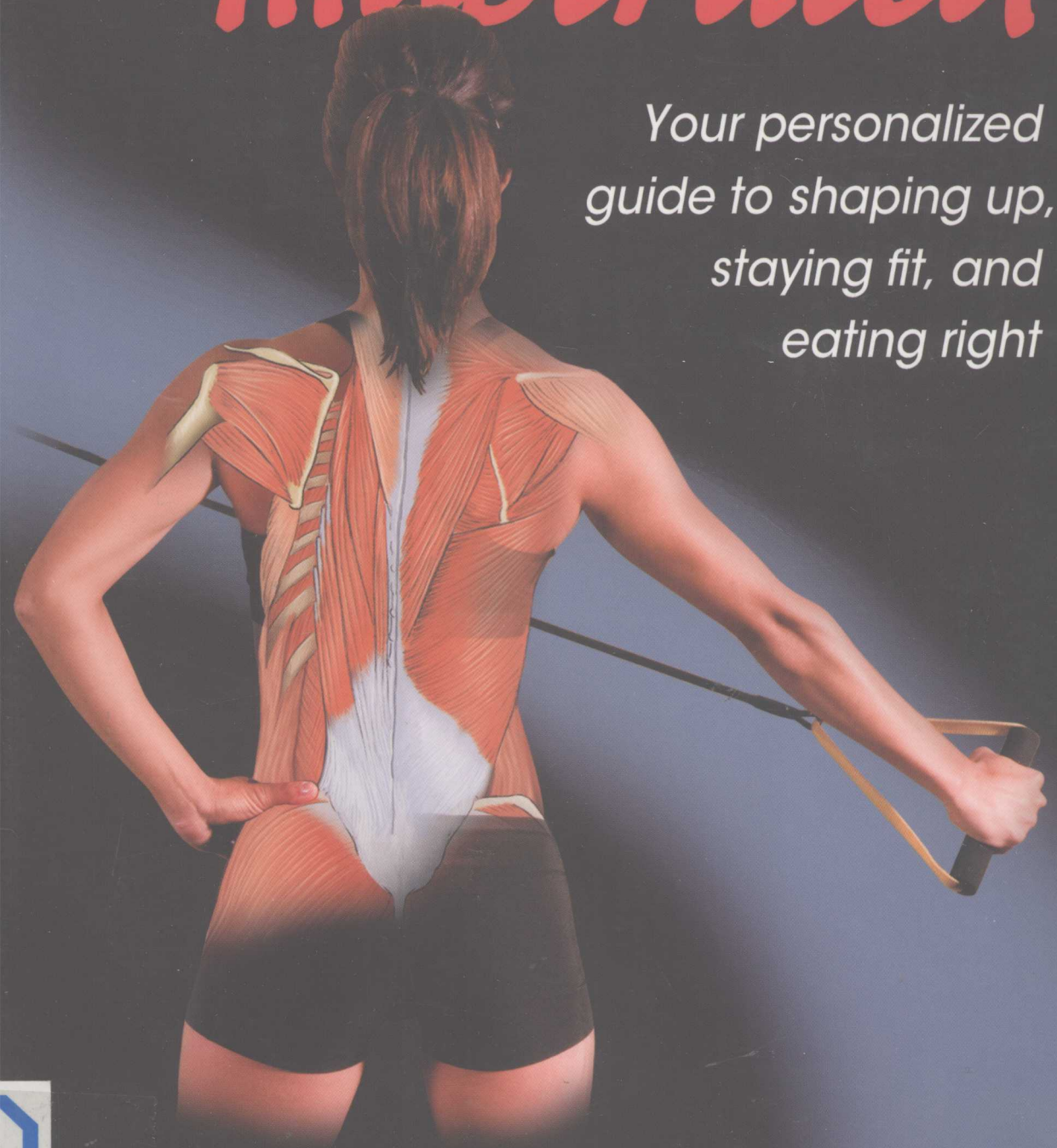


Fitness

Illustrated

*Your personalized
guide to shaping up,
staying fit, and
eating right*



Brian Sharkey

GS04.5

Fitness Illustrated

Brian Sharkey, PhD



常州大学图书馆
藏书章



Human
Kinetics

Library of Congress Cataloging-in-Publication Data

Sharkey, Brian J.

Fitness illustrated / Brian Sharkey.

p. cm.

Includes bibliographical references and index.

ISBN-13: 978-0-7360-8158-0 (soft cover)

ISBN-10: 0-7360-8158-5 (soft cover)

1. Physical fitness. 2. Aerobic exercises. I. Title.

GV481.S445 2010

613.7--dc22

2010003146

ISBN-10: 0-7360-8158-5 (print)

ISBN-13: 978-0-7360-8158-0 (print)

Copyright © 2011 by Brian J. Sharkey

All rights reserved. Except for use in a review, the reproduction or utilization of this work in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including xerography, photocopying, and recording, and in any information storage and retrieval system, is forbidden without the written permission of the publisher.

This publication is written and published to provide accurate and authoritative information relevant to the subject matter presented. It is published and sold with the understanding that the author and publisher are not engaged in rendering legal, medical, or other professional services by reason of their authorship or publication of this work. If medical or other expert assistance is required, the services of a competent professional person should be sought.

Permission notices for material reprinted in this book from other sources can be found on pages viii to xi.

The Web addresses cited in this text were current as of May 2010, unless otherwise noted.

Developmental Editor: Christine M. Drews; **Managing Editor:** Laura Podeschi; **Assistant Editor:** Dena P. Mumm; **Copyeditor:** Tom Tiller; **Indexer:** Alisha Jeddelloh; **Permission Manager:** Martha Gullo; **Graphic Designer and Graphic Artist:** Nancy Rasmus; **Cover Designer:** Keith Blomberg; **Photographer (cover):** Neil Bernstein; **Photo Asset Manager:** Laura Fitch; **Visual Production Assistant:** Joyce Brumfield; **Photo Production Manager:** Jason Allen; **Art Manager:** Kelly Hendren; **Associate Art Manager:** Alan L. Wilborn; **Art Style Development:** Joanne Brummett; **Illustrator (cover):** Jennifer Gibas, Certified Medical Illustrator, **Illustrators (interior):** Jennifer Gibas, Certified Medical Illustrator, Jessica Wheat, Medical Illustrator; **Printer:** Courier Companies, Inc.

Human Kinetics books are available at special discounts for bulk purchase. Special editions or book excerpts can also be created to specification. For details, contact the Special Sales Manager at Human Kinetics.

Printed in the United States of America 10 9 8 7 6 5 4 3 2 1

The paper in this book is certified under a sustainable forestry program.

Human Kinetics

Web site: www.HumanKinetics.com

United States: Human Kinetics
P.O. Box 5076
Champaign, IL 61825-5076
800-747-4457
e-mail: humank@hkusa.com

Canada: Human Kinetics
475 Devonshire Road Unit 100
Windsor, ON N8Y 2L5
800-465-7301 (in Canada only)
e-mail: info@hkcanada.com

Europe: Human Kinetics
107 Bradford Road
Stanningley
Leeds LS28 6AT, United Kingdom
+44 (0) 113 255 5665
e-mail: hk@hkeurope.com

Australia: Human Kinetics
57A Price Avenue
Lower Mitcham, South Australia 5062
08 8372 0999
e-mail: info@hkaustralia.com
New Zealand: Human Kinetics
P.O. Box 80
Torrens Park, South Australia 5062
0800 222 062
e-mail: info@hknewzealand.com

Fitness Illustrated

体适能图解

Ann,

You spice up my life.

Preface

I've been involved with physical activity and fitness most of my life. As a kid I was very active, until one day when my knees ached so much I was unable to walk. I was diagnosed with rheumatic fever, an acute disease characterized by fever and inflammation in the joints and the heart. During my youth I had the illness at least two times. In those days the illness required prolonged bed rest followed by a gradual return to activity. The inactivity and the disease's potential effect on the heart made me appreciate an active life. I recovered well enough to run the mile and other races in high school and college. Those experiences may explain why I decided to devote my professional life to the study of exercise and fitness.

I began college studies just as researchers were beginning to recognize the link between physical inactivity and cardiovascular disease, a topic close to my, uh, heart. Soon thereafter President Eisenhower created the President's Council on Physical Fitness to improve the fitness of military recruits. By the time I graduated from college, I knew what I wanted to do; I just didn't know where or how. Graduate studies focused that interest and prepared me for a university position involving teaching, research, and service. Since then I have devoured research journals, conducted laboratory and field studies, and published a few books. I've worked with adults, athletes, and those involved in physically demanding occupations. And I've presented papers and visited with colleagues throughout the world in an effort to better understand the benefits of physical activity and fitness. I bring this lifetime of study to the task of writing yet another fitness book.

But this book is different. It is well illustrated but not glitzy. It conveys what we know about fitness but avoids excess detail. And it allows me to clear up fallacies and misconceptions concerning exercise and its benefits. I start by answering the question *Why get fit?* You'll look at the benefits of an active life, including what you'll gain physically and psychologically. Then you'll delve into aerobic fitness—what it is, why it is important, and how you can design your own aerobic fitness program with activities that you enjoy. Next you'll look at muscular fitness, including strength, muscular endurance, and flexibility. I provide direction in creating a personalized muscular fitness program to help you reach your goals. You'll also learn what to eat for a physically active lifestyle, how you can manage your weight, and how to deal with various health issues, such as heart disease, arthritis, and fitness problems such as muscle cramps and knee pain. I explain fitness facts and fallacies so that you can be an educated fitness consumer. In the final chapter, you'll explore vitality and longevity: how you can add life to your years by becoming active now.

Whether you are just beginning or have been active for a long time, this book will pique your interest, focus your direction, and unearth the self-directed motivation that will keep you active the rest of your life.

Acknowledgments

I want to thank Rainer and Julie Martens for encouraging me to write this book, even when I doubted my ability to think visually and write sparingly. The talented staff at Human Kinetics helped bring this book to fruition. Contributors included Nancy Rasmus, graphic designer, who conceived the original design for this book and fit all the pieces together in an attractive layout; Jennifer Gibas, illustrator, who refined our sketchy illustrations; Neil Bernstein, photographer, who took the technique photos in chapter 7; Laura Podeschi, managing editor, who checked and double-checked all the details of this book; and Chris Drews, the ever-patient editor who did all she could to make the book factual and readable. To these folks and others at Human Kinetics I say thanks again for a job well done.

Credits

Figures

- Page 6 (top)** Adapted, by permission, from J. Buckworth and R.K. Dishman, 2002, *Exercise psychology* (Champaign, IL: Human Kinetics), 119. Data from M. Bahrke and W.P. Morgan, 1978, "Anxiety reduction following exercise and meditation," *Cognitive Therapy and Research* 2(4): 323-333.
- Page 6 (bottom)** Adapted, by permission, from J. Buckworth and R.K. Dishman, 2002, *Exercise psychology* (Champaign, IL: Human Kinetics), 140. Data from J. Fremont and L.W. Craighead, 1987, "Aerobic exercise and cognitive therapy in the treatment of dysphoric moods," *Cognitive Therapy and Research* 11(2): 241-251.
- Page 7 (top)** Adapted, by permission, from D.L. Roth and D.S. Holmes, 1985, "Influence of physical fitness in determining the impact of stressful life events on physical and psychological health," *Psychosomatic Medicine* 47(2): 169.
- Page 7 (middle)** Adapted, by permission, from J. Buckworth and R.K. Dishman, 2002, *Exercise psychology* (Champaign, IL: Human Kinetics), 169. Data from T.M. DiLorenzo et al., 1999, "Long-term effects of aerobic exercise on psychological outcomes," *Preventive Medicine* 28(1): 75-85.
- Page 7 (bottom)** Adapted, by permission, from S. Colcombe and A.F. Kramer, 2003, "Fitness effects on the cognitive function of older adults: A meta-analytic study," *Psychological Science* 14(2): 129.
- Page 12** Adapted, by permission, from G.J. Balady, B. Chaitman, D. Driscoll, et al., 1998, "AHA/ACSM Joint Position Statement: Recommendations for cardiovascular screening, staffing, and emergency policies at health/fitness facilities," *Medicine & Science in Sports & Exercise* 30(6): 1009-1018.
- Page 21** Adapted, by permission, from B.J. Sharkey and S.E. Gaskell, 2007, *Fitness & health*, 6th ed. (Champaign, IL: Human Kinetics), 18.
- Page 26** Adapted from B.J. Sharkey and S.E. Gaskell, 2009, *Fitness and work capacity*, 2009 edition, NWCG PMS 304-2 (Boise, ID: National Wildfire Coordinating Group, Safety and Health Working Team, National Interagency Fire Center), 36.
- Page 33** Adapted, by permission, from R. Martens, 2004, *Successful coaching*, 3rd ed. (Champaign, IL: Human Kinetics), 267.
- Page 37** Source: Expert Panel on the Identification, Evaluation, and Treatment of Overweight in Adults, 1998, "Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults: Executive summary," *American Journal of Clinical Nutrition* 68(4): 899-917.
- Page 217** Adapted from U.S. Department of Agriculture, 2007, *Oxygen radical absorbance capacity (ORAC) of selected foods—2007*. [Online.] Available: www.ars.usda.gov/sp2userfiles/place/12354500/data/orac/orac07.pdf [December 18, 2009].
- Page 241** Reprinted, by permission, from K.E. Powell and R.S. Paffenbarger, 1985, "Workshop on epidemiologic and public health aspects of physical activity and exercise: A summary," *Public Health Reports* 100(2): 123.
- Page 256** Adapted, by permission, from W.H. Ettinger, B.S. Wright, and S.N. Blair, 2006, *Fitness after 50* (Champaign: Human Kinetics), 123-124.
- Page 285 (top)** Reprinted from National Center for Health Statistics, 2004, "United States life tables, 2002," *National Vital Statistics Report* 53(6): 5. [Online]. Available: http://www.cdc.gov/nchs/data/nvsr/nvsr53/nvsr53_06.pdf [February 16, 2010].

Page 285 (bottom) Reprinted, by permission, from B.J. Sharkey and S.E. Gaskill, 2007, *Fitness & health*, 6th ed. (Champaign, IL: Human Kinetics), 349.

Page 286 Adapted, by permission, from S. Mandic, J.N. Myers, R.B. Oliveira, P. Abella, and V.F. Froelicher, 2009, "Characterizing differences in mortality at the low end of the fitness spectrum," *Medicine & Science in Sports & Exercise* 41(8): 1573-1579.

Photos

Pages i, 5, 10, 11, 18-19, 21, 23, 25, 27, 28, 29, 35, 36, 38, 48 (bottom), 53, 57, 66 (back), 89, 91, 106, 112 (bottom), 116 (bottom), 119, 131, 133, 134, 135, 136, 137, 139, 142, 143, 144, 145, 146, 147, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174 (middle), 177 (top left, bottom right), 178, 179 (top left, bottom left, bottom right), 180 (top left, bottom left, bottom right), 181, 182, 186, 187, 188, 202, 209 (top), 220, 237, 239 (top), 245, 246, 247, 249, 251, 260-261, 262, 264, 273, 275, 276 © Human Kinetics

Page v © Stephen Coburn/fotolia.com

Pages xii-1, 14-15, 40-41, 72-73 © Digital Vision

Pages 2, 69 (left), 79, 80, 81, 82, 83, 277 (top) © EastWest Imaging/fotolia.com

Pages 2-3 © Mats Tooming - Fotolia.com

Page 3 © Liv Friis-larsen - Fotolia.com

Page 4 © Artlux/fotolia.com

Pages 6, 8 (top left), 24 (top), 31, 190-191, 192-193, 196 (middle, bottom), 198, 199, 203, 204, 207, 211, 212, 213, 214 (bottom), 215, 217, 218, 223, 225 (bottom), 238, 278, 297 (bottom) © Photodisc

Page 8 (top right) © diego cervo/fotolia.com

Pages 8 (bottom), 61, 68 (right), 77, 98, 127, 138, 301 (top) © Monkey Business/fotolia.com

Pages 9, 26, 32, 42-43, 45, 47, 84-85, 92 (bottom), 99 (bottom), 103, 114, 115, 152, 177 (bottom right), 179 (top right), 185, 236 © Photodisc/Getty Images

Pages 16, 124, 150, 295, 296 © PhotoDisc/Kevin Peterson

Pages 16-17, 24 (bottom), 99 (top), 124-125, 125, 193, 221, 225 (middle), 239 (bottom), 277 (bottom) © Eyewire

Pages 20 (left), 195 © Comstock/Corbis

Page 20 (right) © Stockdisc Royalty Free Photos

Page 30 © Creative images - Fotolia

Page 42 © Arrow Studio - Fotolia

Pages 48 (top), 183 © Kzenon/fotolia.com

Pages 50, 219 © bilderbox/fotolia.com

Pages 51, 176, 260 © Andres Rodriguez/fotolia.com

Pages 58, 68 (left), 73, 74-75, 140, 141 © Wojciech Gajda/fotolia.com

Page 59 © Crackle Photography/Crackle Bingham

Pages 60, 64-65 © Maridav/fotolia.com

Page 63 © Stewart Cohen/Digital Vision

Page 66 (front) © AP Photo/Elaine Thompson
Pages 66-67 © Steve Lovegrove/fotolia.com
Pages 68 (middle), 75 © Paylessimages/fotolia.com
Pages 69 (middle), 86 © Lane Erickson/fotolia.com
Pages 69 (right), 87, 197 © Stockbyte
Page 70 © Noam/fotolia.com
Page 71 © Yuri Arcurs/fotolia
Pages 76-77 © Marcel Mooij/fotolia.com
Pages 78-79, 118, 150-151, 257, 284 © Galina Barskaya/fotolia.com
Pages 88, 129 © wiktorkubniak/fotolia.com
Page 90 © einstein/fotolia.com
Pages 92 (top), 105 © .shock/fotolia.com
Pages 93, 293 © Suprijono Suharjoto/fotolia.com
Pages 94-95 © Doug Olson/fotolia.com
Page 96 © bsilvia/fotolia.com
Pages 96-97, 297 (top) © Robert Cocquyt/fotolia.com
Page 99 (middle) © Pete Saloutos/fotolia.com
Page 104 © Lisa F. Young/fotolia.com
Page 109 © nyul/fotolia.com
Page 110 © David Papazian/Corbis
Page 111 © Monteleone/fotolia.com
Page 112 (top) © Juriah Mosin/fotolia.com
Page 113 © iStockphoto/Nancy Honeycutt
Page 116 (top) © Christy Thompson - Fotolia.com
Pages 117, 270 © Christophe Schmid/fotolia.com
Pages 120, 254, 255, 298, 299, 301 (bottom) © Bananastock
Pages 122-123 © Helder Almeida/fotolia.com
Page 126 (top) © digerati/fotolia.com
Page 126 (bottom) © Anton/fotolia.com
Pages 132, 180, 289 © Brand X Pictures
Pages 148-149 © rcaucino/fotolia.com
Page 174 (top) © Photoshot
Pages 174 (bottom), 234, 250, 303 © iofoto/fotolia.com
Page 177 (top right) © Maksym Gorpenyuk/fotolia.com
Pages 192, 282 © PhotoDisc/Barbara Penoyar
Page 194 © blue eye/fotolia.com
Pages 196 (top), 214 (top, middle) © Art Explosion
Pages 200-201 © LadyInBlack/fotolia.com
Page 209 (bottom) © Svenja98 - Fotolia
Page 210 © Eric Gevaert/fotolia.com
Page 222 © Alexey Fursov/fotolia.com
Page 225 (top) © Robert Kudera/fotolia.com
Pages 226, 228 © Getty Images/Stockbyte
Pages 227, 240 © Human Kinetics/Kelly Huff

Page 229 © Bernd_Leitner/fotolia.com
Page 230 © AVAVA/fotolia.com
Pages 232-233 © amridesign/fotolia.com
Pages 234-235 © Leonid Tit/fotolia.com
Page 239 (middle) © Bill Crump/Brand X Pictures
Page 242 © pressmaster/fotolia.com
Page 244 © sframe/fotolia.com
Page 252 © Jupiter Images
Page 253 © Michael Svoboda/fotolia.com
Pages 258-259 © iStockphoto/Digital Planet Design/Sean Locke
Page 267 © Stockbyte/Corbis
Page 268 (left) © iStockphoto/Valentin Casarsa
Page 268 (right) © Ljupco Smokovski/fotolia.com
Pages 269, 288 © auremar/fotolia.com
Page 272 © Susan Rae Tannenbaum/fotolia.com
Page 279 © Andrea Rankovic/fotolia.com
Pages 280-281, 282-283 © Ragen Sanner
Page 287 © iStockphoto/Rich Legg
Page 290 © carmeta/fotolia.com
Page 291 © Simone van den Berg/fotolia.com
Page 294 © Comstock
Page 300 © iStockphoto/Catherine Yeulet
Page 302 © iStockphoto/Jacom Stephens
Page 315 © Brian Sharkey

Tables

Page 25 Adapted from "The Effects of Exercise and Fitness on Serum Lipids in College Women," p. 46, by D. Kasari, 1976, unpublished master's thesis, University of Montana.

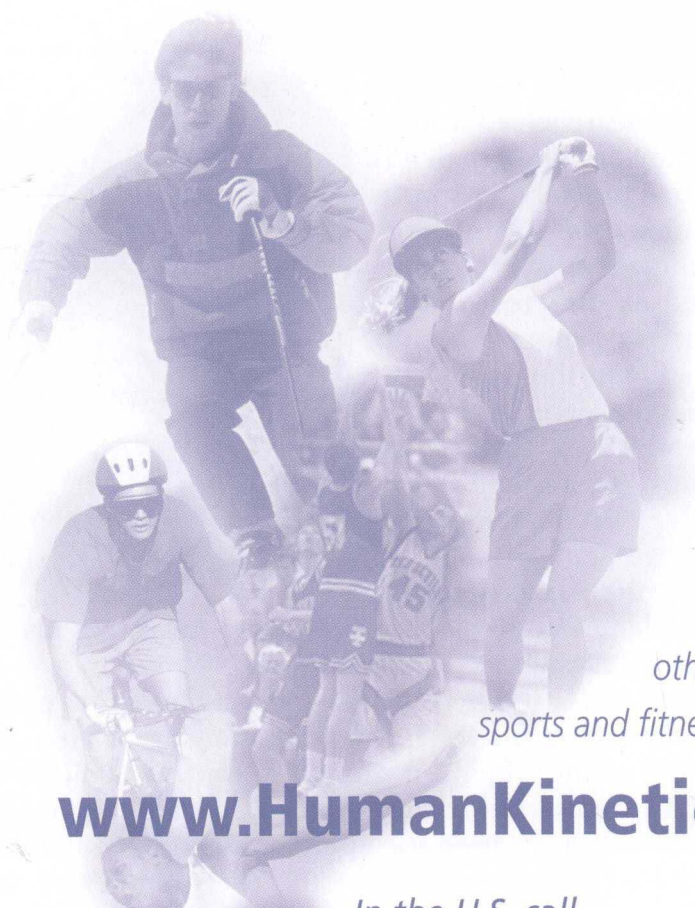
Pages 46, 50, 52 (top, bottom), 128, 197 Adapted, by permission, from B.J. Sharkey and S.E. Gaskell, 2007, *Fitness & health*, 6th ed. (Champaign, IL: Human Kinetics), 103, 106, 107, 149, and 213.

Pages 73, 75, 77 Reprinted, by permission, from B.J. Sharkey and S.E. Gaskell, 2007, *Fitness & health*, 6th ed. (Champaign, IL: Human Kinetics), 119, 120, and 121, as adapted from President's Council on Physical Fitness and Sports, 1975, *An introduction to physical fitness*.

Pages 80-83, 86, 87, 199, 200, 208 Reprinted, by permission, from B.J. Sharkey and S.E. Gaskell, 2007, *Fitness & health*, 6th ed. (Champaign, IL: Human Kinetics), 123-124, 126, 212, 216, and 312.

Page 263 Reprinted, by permission, from B.J. Sharkey and S.E. Gaskell, 2006, *Sport physiology for coaches* (Champaign, IL: Human Kinetics), 8.

Pages 304-307 Adapted, by permission, from S.N. Blair, A.L. Dunn, B.H. Marcus, R.A. Carpenter, and P. Jaret, 2001, *Active living every day* (Champaign, IL: Human Kinetics), 179-182. Based on selected MET values created by B.E. Ainsworth, W.L. Haskell, M.C. Whitt et al., 2000, "Compendium of physical activities: An update of activity codes and MET intensities," *Medicine & Science in Sports & Exercise* 32(9) Suppl: S498-S516.



*You'll find
other outstanding
sports and fitness resources at*

www.HumanKinetics.com

In the U.S. call

1-800-747-4457

Australia..... 08 8372 0999
Canada 1-800-465-7301
Europe..... +44 (0) 113 255 5665
New Zealand..... 0800 222 062



HUMAN KINETICS
The Premier Publisher for Sports & Fitness
P.O. Box 5076 • Champaign, IL 61825-5076 USA

Contents

Preface vi • Acknowledgments vii • Credits viii

- 1 Activity and Fitness 1**

Why Get Fit? Discover the benefits of being active, get the facts on how much activity you need, and find out whether being physically active is safe for you.
- 2 Understanding Aerobic Fitness 15**

O₂ and You Explore why aerobic exercise is so good for you, the role of oxygen, and how your body changes with aerobic activity.
- 3 Aerobic Fitness Training 41**

A Gentle Pastime Investigate how to adjust your aerobic fitness training program to reach your goals, and decide which activities will be most meaningful to you.
- 4 Aerobic Programs 65**

Have It Your Way Personalize your aerobic fitness training program based on your fitness and experience level, and discover training tips such as what to wear, where to train, and how to deal with training problems.
- 5 Understanding Muscular Fitness 95**

Strength and Endurance Find out how your muscles work and how they change with training. Look at how to improve your muscular fitness, including strength, endurance, flexibility, speed, power, balance, agility, and coordination.
- 6 Muscular Fitness Training 123**

Shape Yourself Evaluate your muscular fitness and select your muscular fitness goals, learn how to improve and maintain your strength and muscular endurance, and explore flexibility and core training.

7 Muscular Programs 149

Designed for You Design your own muscular fitness program using the 53 flexibility, core training, strength, and muscular endurance exercises illustrated in this chapter.

8 Nutrition and Weight Control 191

Eat to Live Discover how to adjust your diet as you become active, and take a new look at weight control and dieting.

9 Health Issues and Exercise Tips 233

Overcoming Hurdles Choose meaningful activities, monitor your health, and use these prevention tips to deal with exercise conditions such as muscle soreness, muscle cramps, knee pain, and arthritis.

10 Fitness Facts and Fallacies 259

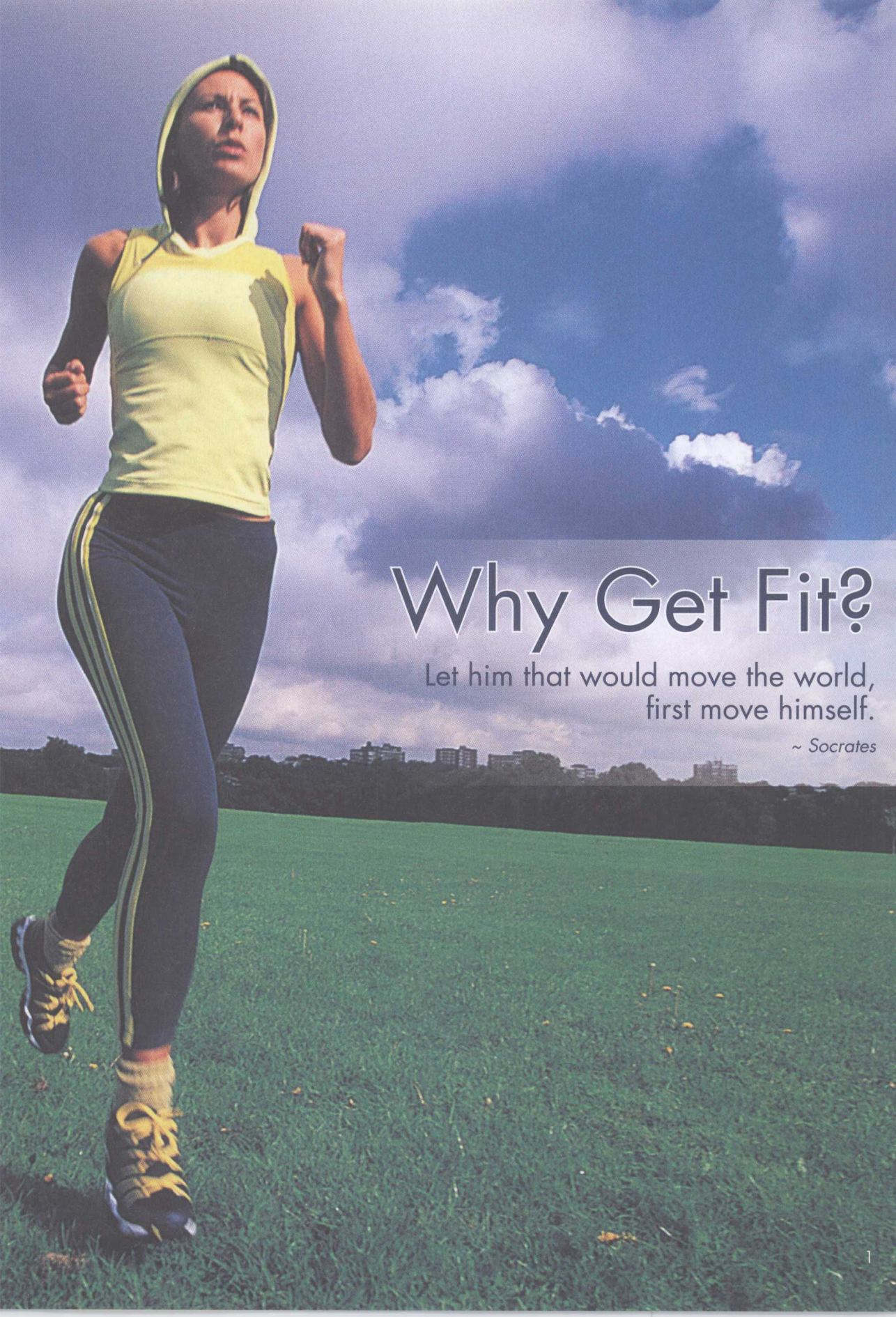
What's the Truth? Get the facts on 12 training principles and 7 fitness fallacies so that you can evaluate the plethora of fitness information on the Internet, TV, and other media.

11 Vitality and Longevity 281

Add Life to Your Years Alter your view of getting older: See how you can extend your vigorous years by living an active, healthy lifestyle.

Appendix: Energy Expenditure Chart 304 •
Bibliography 308 • Index 310 •
About the Author 315





Why Get Fit?

Let him that would move the world,
first move himself.

~ Socrates

Sarah

is a 28-year-old attorney

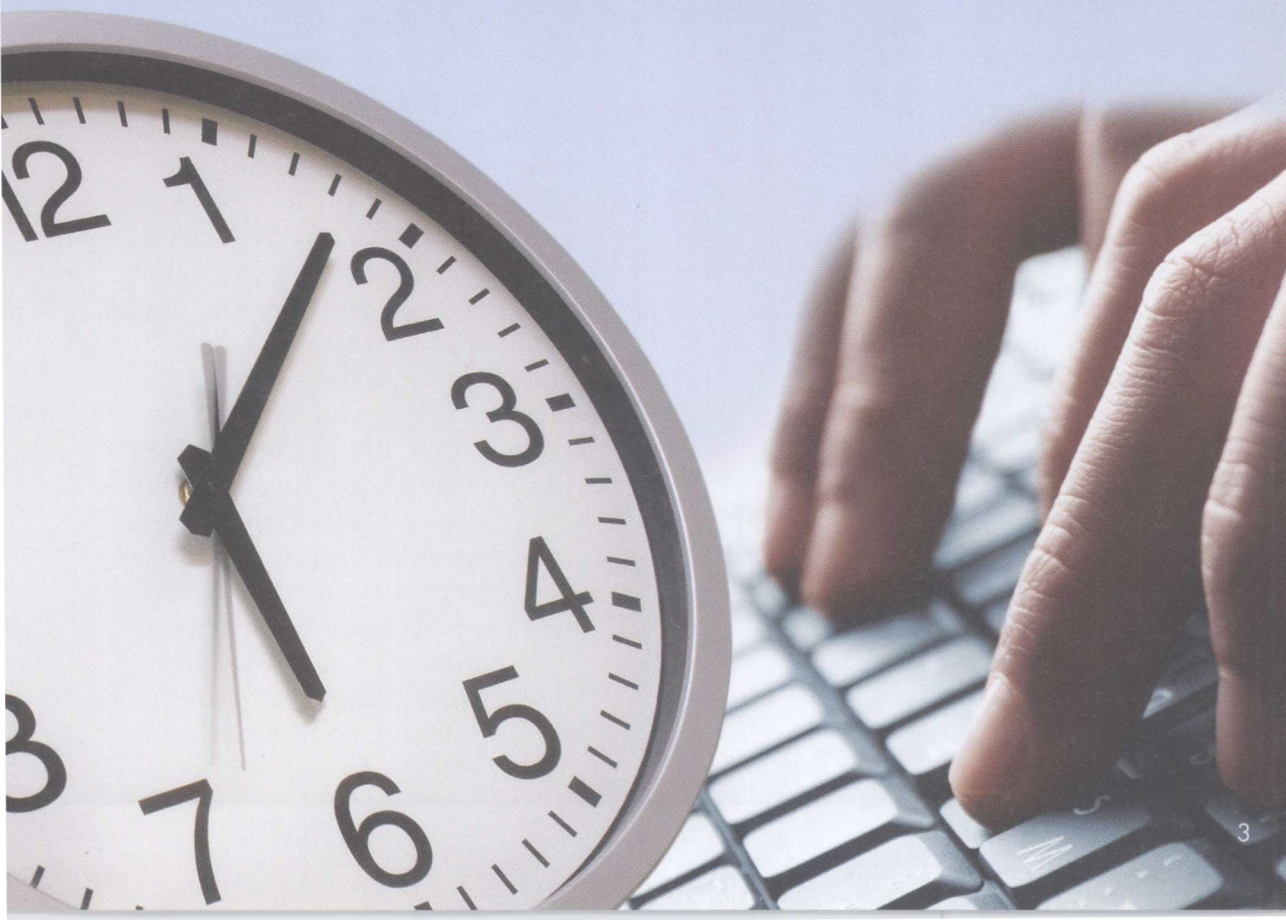
caught up in the struggle to succeed in a high-powered urban law firm. She had been active in college but found little time for fitness in law school and now finds even less. Working more than 60 hours per week leaves her precious few hours for a personal life, let alone regular physical activity.



Sarah

Her weight has crept up...

Her weight has crept up, and she lacks the vitality she enjoyed when she was active, so she wants to lose weight, regain fitness, and feel healthy again. She wants to be able to run to catch a train or plane, carry luggage through the airport without breaking a sweat, and work all day and still have the energy to go dancing. In order to meet this challenge, Sarah must set attainable goals, find time to achieve them, and get going. This book is dedicated to Sarah and to the many others who want to become active and fit, to eat right, and to experience the benefits and pleasures of an active life.



What Are the Benefits

A woman with dark hair, wearing a white ribbed tank top, is sitting on a bed. She has her back to the camera and her arms are raised straight up, with her hands clenched into fists. She is looking out a window with white curtains. The room is brightly lit, suggesting morning light.

Imagine awakening in a body that is newly transformed by several months of fitness training—a condition not unlike a state of grace, one that is inwardly sensed rather than outwardly observed. You would rise each day with the ability to carry out daily tasks with vigor and alertness, remain free of undue fatigue, enjoy your leisure pursuits, and meet unforeseen emergencies. You would have the energy and muscular fitness to carry out work and activity demands; the flexibility and balance to perform well and avoid injury; and the stamina to handle home life, work, recreation, and the inevitable unexpected demands.

If you are like many active individuals, your first thought upon waking would focus on the physical activity you planned to perform that day, as well as when and where you would do it. Indeed, when you become active and even addicted to exercise, regular physical activity becomes an indispensable part of your life. Physical activity and fitness do more than improve your performance; they also improve your physical and psychological health, thus enhancing your vigor and extending the prime of your life.