CONTENTS

DVD-ROM Contents **ix** ■ Contributors **xi** ■ Preface **xiii** ■ Acknowledgments **xv**

PART I Core Elements 1

Chapter 1 Introduction and Historical Overview 3

Jean M. Irion, PT, EdD, SCS, ATC; and Lori Thein Brody, PT, PhD, SCS, ATC

History of Aquatic Healing and Rituals 4
Modern Origins of Aquatic Therapy 7
Status of Aquatic Rehabilitation 8
Indications and Advantages of an Aquatic-Based Program 9
Contraindications and Precautions for an Aquatic-Based Program 11
Aquatic Programs and Facilities 11
Summary 14

Chapter 2 Aquatic Service Providers 15

Charlotte O. Norton, DPT, MS, ATC, CSCS; and Lynette Jamison, MOT, OTR/L, CPO

Lyton Model for the Aquatic Team 16
Licensure, Registration, Certification, and Title Acts 16
Function of Each Team Member in the Aquatic Continuum 19
Summary 24

Chapter 3 Aquatic Properties and Therapeutic Interventions 25

Jean M. Irion, PT, EdD, SCS, ATC

Physical Properties of Water 26
Fluid Dynamic Properties of Water 31
Summary 34

Chapter 4 Physiological Responses to Immersion and Aquatic Exercise . . . 35

Dawn T. Gulick, PT, PhD, ATC, CSCS; and Paula Richley Geigle, PT, PhD

Pulmonary System 36
Cardiovascular System 38
Renal System 39
Musculoskeletal System 40
Neuromuscular System 41
Summary 42

PART II Philosophy and Technique Elements 43

Chapter 5 The Halliwick Concept 45

Johan Lambeck, PT; and Urs N.Gamper, PT

Historical Overview 46
Treatment Classification 47
Halliwick and ICF 50
Learning Stages 51
Function-Level Applications 54
Activity-Level Applications 59
Participation-Level Applications 65
Specific Skill Training 65
Summary 71

Chapter 6 The Bad Ragaz Ring Method 73

Urs N. Gamper, PT; and Johan Lambeck, PT

Physiotherapeutic and Mechanical Principles 74
Proprioceptive Neuromuscular Facilitation 75
Indications 76
Treatment Goals 76
Application of Techniques 77
Treatment Time 79
Exercise Progression 79
Movement Patterns 80
Patterns of the Lower Extremities 82
Patterns of the Trunk 90
Patterns of the Upper Extremities 95
Summary 100

Chapter 7 Ai Chi 101

Ruth Sova, MS, ATRIC

Historical Overview 102
Breathing Patterns 102
Movement Principles 105
Stance and Movement Patterns 106
Ai Chi Benefits 112
Applications in Patient Populations 114
Summary 116

Chapter 8 Watsu 117

Lynette Jamison, MOT, OTR/L, CPO

History and Philosophy 118
Treatment Progression 119
Training and Certification 122
Physiological Effects 123
Psychological Effects 124

Treatment Applications 124
Precautions and Contraindications 125
Summary 127

Chapter 9 Swim Stroke Training and Modification for Rehabilitation 129
Emily Dunlap, PT
Swim Training in an Aquatic Therapy Treatment Plan 130
Swim Training Progression 132
Recovery Skills 133
Static Floating Control 137
Suspension Skills 138
Changing Directions 138
Swim Training Equipment 138
Swim Strokes and Modification 141
Injury Modifications 162
Summary 175

PART III Client Elements 177

Chapter 10 Assessment and Evaluation 179
Paula Richley Geigle, PT, PhD
Clinical Decision Making 180
Initial Assessment and Evaluation 181
Medical Clearance 186
Informed Consent 186
Water Safety Screening 188
Vital Sign Baseline Data 190
Documenting Aquatic Programming and Progression 191
Discharge From Aquatic Programming 192
Summary 193

Chapter 11 Specialized Aquatic Cardiovascular Training 195
Dawn T. Gulick, PT, PhD, ATC, CSCS
Monitoring Cardiovascular Performance 197
Cerebral Palsy 199
Brain Injury and Stroke 201
Multiple Sclerosis 202
Rheumatoid Arthritis 203
Pregnancy 205
Cardiopulmonary Disease 206
Fibromyalgia 208
Poliomyelitis 210
Obesity 210
Older Populations 211
Injured Athletes 215
Summary 219

Chapter 12 Neuromuscular Training 221
David M. Morris, PT, PhD; and Paula Richley Geigle, PT, PhD
Rehabilitation of People With Neuromuscular Disorders 224
General Guidelines for Treatment Design 228
Aquatic Techniques for Neurorehabilitation Application 230
Balance and Postural Control 236
Aquatic Wellness Programs 239
Summary 242

Chapter 13 Core Musculoskeletal Training 243
Lori Thein Brody, PT, PhD, SCS, ATC
Functional Anatomy 244
Indications for Aquatic Therapy 249
Activities to Improve Mobility 249
Activities to Increase Muscle Performance 259
Core Emphasis Cardiorespiratory Training 263
Specific Exercise Recommendations 265
Summary 267

Chapter 14 Upper-Quarter Musculoskeletal Training 269
Lori Thein Brody, PT, PhD, SCS, ATC
Functional Anatomy 270
Indications for Aquatic Therapy 275
Activities to Improve Mobility 275
Activities to Improve Muscle Performance 281
Upper-Quarter Focus Cardiorespiratory Training 286
Specific Exercise Recommendations 286
Summary 287

Chapter 15 Lower-Quarter Musculoskeletal Training 289
Lori Thein Brody, PT, PhD, SCS, ATC
Functional Anatomy 290
Indications for Aquatic Therapy 294
Activities to Increase Mobility 297
Activities to Improve Muscle Performance 301
Lower-Quarter Focus Cardiorespiratory Training 310
Specific Exercise Progressions 310
Summary 312

Chapter 16 Case Scenarios of People With Specific Needs 313
Paula Richley Geigle, PT, PhD
Traumatic Brain Injury and Postpartum 314
Spina Bifida 317
Femur Fracture in a Man With a Diagnosis of Cerebral Palsy 320

References **325** ■ Index **343** ■ About the Editors **351** ■ DVD User Instructions **352**