

Contents

Preface vii

- 1 Tests, Data Analysis, and Conclusions 1**
Matthew R. Rhea, PhD, and Mark D. Peterson, PhD
Sport Performance and Testing 2 • Screening Tests 2 • Data Evaluation and Statistical Analysis 3 • Normalizing Fitness Data 10 • Tracking Data Over Time 12 • Professional Applications 13 • Summary 13
- 2 Body Composition 15**
Nicholas A. Ratamess, PhD
Sport Performance and Body Composition 16 • Body Composition Measurement 19 • Measuring Height, Body Weight, and Body Mass Index 20 • Body Fat Standards 37 • Comparison of Body Composition Techniques 38 • Professional Applications 40 • Summary 41
- 3 Heart Rate and Blood Pressure 43**
Daniel G. Drury, DPE
Heart Rate Control 44 • Exercise Intensity and Heart Rate 44 • Sport Performance and Heart Rate 47 • Heart Rate Measurement 48 • Blood Pressure 53 • Professional Applications 63 • Summary 64
- 4 Metabolic Rate 65**
Wayne C. Miller, PhD
Components of Energy Expenditure 66 • Sport Performance and Metabolic Rate 71 • Measurement of Energy Expenditure 72 • Prediction of Energy Expenditure 75 • Estimation of 24-Hour and Physical Activity Energy Expenditure 76 • Relevance of and Applications for Metabolic Testing 79 • Comparing Metabolic Rate Measurement Methods 84 • Professional Applications 86 • Summary 88
- 5 Aerobic Power 91**
Jonathan H. Anning, PhD
Regression Equation Variables 93 • Maximal Exercise Testing Methods 93 • Submaximal Exercise Testing Methods 110 • Regression Equation Calculations 119 • Professional Applications 121 • Summary 123

- 6 Lactate Threshold 125**
Dave Morris, PhD
Energy Pathways and Lactate Metabolism 126 • Sport Performance and Lactate Threshold 130 • Performing a Lactate Threshold Test 130 • Maximal Lactate Steady State 138 • Using Lactate Threshold Data 140 • Professional Applications 143 • Summary 145
- 7 Muscular Strength 147**
Gavin L. Moir, PhD
Definition of Muscular Strength 148 • Factors Affecting Muscular Force Production 149 • Sport Performance and Muscular Strength 158 • Methods of Measurement 158 • Field Tests for Muscular Strength 162 • Predicting 1RM Values From Multiple Repetitions 174 • Laboratory Tests for Maximal Muscular Strength 176 • Isokinetic Strength Testing 182 • Comparing Muscular Strength Measurement Methods 189 • Professional Applications 189 • Summary 191
- 8 Muscular Endurance 193**
Gavin L. Moir, PhD
Definition of Muscular Endurance 193 • Field Tests for Muscular Endurance 196 • Laboratory Tests for Muscular Endurance 210 • Comparing Muscular Endurance Measurement Methods 213 • Professional Applications 213 • Summary 216
- 9 Power 217**
Mark D. Peterson, PhD
Operationalizing Power 218 • Mechanisms of Power Production and Expression 219 • Types and Factors of Power 223 • Sport Performance and Power 227 • Tests for Power 229 • Warm-Up and Postactivation Potentiation (PAP): A Special Consideration for Testing Power 248 • Professional Applications 249 • Summary 252
- 10 Speed and Agility 253**
N. Travis Triplett, PhD
Speed 253 • Agility 254 • Sport Performance and Speed and Agility 256 • Test Selection 256 • Methods of Measurement 257 • Professional Applications 272 • Summary 274

11 Mobility 275**Sean P. Flanagan, PhD**

Fundamental Concepts of Mobility 276 • Sport Performance and Mobility 281 • Mobility Testing 283 • Range of Motion Tests 286 • Interpretation of Results 290 • Comparing Mobility Measurement Methods 291 • Professional Applications 292 • Summary 294

12 Balance and Stability 295**Sean P. Flanagan, PhD**

Body Mechanics 296 • Control Theory 299 • Balance and Stability Tests 301 • Sport Performance and Balance and Stability 305 • Measuring Balance and Stability 308 • Interpreting the Results 312 • Professional Applications 313 • Summary 315

References 317

Index 350

About the Editor 358

Contributors 359