

Contents

Preface vii

Acknowledgments ix

Credits xi

Chapter 1 Muscle Fiber Types **1**

Grouping Fibers by Myosin Heavy-Chain (MHC) Composition 3

Functional Properties of Fibers Containing Different
Myosin Heavy-Chain Profiles 8

Fiber Types and Performance 32

Summary 36

Chapter 2 Motoneurons and the Muscle Units They Innervate **37**

The Muscle Unit and Muscle Unit Types 39

The Motoneuron Component of the Motor Unit 47

The Heckman–Binder Model of Motor Unit Recruitment 63

Motor Unit Recruitment During Different Types
of Voluntary Contractions 66

Summary 81

Chapter 3 Neuromuscular Fatigue **83**

Two Basic Fatigue Mechanisms Involving the Nervous System 85

Reduced Motoneuron Activity During Various Types of Contractions 89

Evidence From Reduced Animal Preparations on Mechanisms
of Neuromuscular Fatigue 107

Summary 110

Chapter 4 Endurance Training of the Neuromuscular System 111

- Muscle Adaptations 112
- The Neuromuscular Junction 128
- Motoneuron Adaptations to Endurance Training 133
- Spinal Cord Adaptations to Endurance Training 137
- Summary 141

Chapter 5 Strength Training 143

- Acute Effects of Strength Training on Protein Synthesis and Degradation 145
- The Chronic Effect of Resistance Overload on Muscle Phenotype 154
- Neural Effects of Resistance Training 161
- Summary 169

Chapter 6 Neuromuscular Responses to Decrease in Normal Activity 171

- General Principles Underlying Neuromuscular Responses to Reduced Activity 173
- Models of Decreased Neuromuscular Usage 176
- Summary 202

- References 203
- Index 231
- About the Author 237