

FIFTH EDITION

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# Rehabilitation Techniques

for Sports Medicine and Athletic Training

WILLIAM E. PRENTICE

Fifth Edition

# Rehabilitation Techniques for Sports Medicine and Athletic Training

William E. Prentice, PhD, PT, ATC, FNATA

Professor, Coordinator of the Sports Medicine Program  
Department of Exercise and Sport Science  
University of North Carolina at Chapel Hill  
Chapel Hill, North Carolina





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# Brief Contents

---

## **PART ONE** The Basis of Injury Rehabilitation

---

- 1** Essential Considerations in Designing a Rehabilitation Program for the Injured Patient 1
- 2** Understanding and Managing the Healing Process through Rehabilitation 18
- 3** The Evaluation Process in Rehabilitation 46
- 4** Psychological Considerations for Rehabilitation of the Injured Patient 71

## **PART TWO** Achieving the Goals of Rehabilitation

---

- 5** Establishing Core Stability in Rehabilitation 97
- 6** Reestablishing Neuromuscular Control 122
- 7** Regaining Postural Stability and Balance 144
- 8** Restoring Range of Motion and Improving Flexibility 175
- 9** Regaining Muscular Strength and Endurance 197
- 10** Maintaining Aerobic Capacity and Endurance during Rehabilitation 214

## **PART THREE** The Tools of Rehabilitation

---

- 11** Plyometrics in Rehabilitation 227
- 12** Open- versus Closed-Kinetic-Chain Exercise in Rehabilitation 248

- 13** Joint Mobilization and Traction Techniques in Rehabilitation 267
- 14** Proprioceptive Neuromuscular Facilitation Techniques in Rehabilitation 296
- 15** Aquatic Therapy in Rehabilitation 318
- 16** Functional Progressions and Functional Testing in Rehabilitation 340

## Rehabilitation Techniques for

## **PART FOUR** Specific Injuries

---

- 17** Rehabilitation of Shoulder Injuries 364
- 18** Rehabilitation of Elbow Injuries 418
- 19** Rehabilitation of Wrist, Hand, and Finger Injuries 451
- 20** Rehabilitation of Groin, Hip, and Thigh Injuries 484
- 21** Rehabilitation of Knee Injuries 526
- 22** Rehabilitation of Lower-Leg Injuries 579
- 23** Rehabilitation of Ankle and Foot Injuries 608
- 24** Rehabilitation of Injuries to the Spine 646

**Glossary 692**

**Index 697**

## PERTINENT TO THE ATHLETIC TRAINER

Many texts are currently available on the subject of rehabilitation of injury in various patient populations. However, the fifth edition of this text concentrates exclusively on the application of rehabilitation techniques in a sport-related setting for a unique sports medicine emphasis.

## PEDAGOGICAL AIDS

The teaching aids provided in this text to assist the student include the following:

*Objectives.* These goals are listed at the beginning of each chapter to introduce students to the points that will be emphasized.

*Figures and Tables.* The number of new photos and tables included throughout the text has been significantly increased in an effort to provide as much visual and graphic demonstration of specific rehabilitation techniques and exercises as possible.

*Clinical Decision-Making Exercises.* Approximately 150 clinical decision-making exercises are found throughout the text to challenge the student to integrate and apply the information presented in this text to clinical cases that typically occur in an athletic training setting. Solutions for each exercise are presented at the end of each chapter.

*Rehabilitation Plans.* Rehabilitation Plans can be found in each chapter in Part Four as examples of case studies that help apply the thought process an athletic trainer should use in developing and implementing a rehabilitation program.

*Summary.* Each chapter has a summary list that reinforces the major points presented.

*References.* A comprehensive list of up-to-date references is presented at the end of each chapter to guide the reader to additional information about the chapter content.

*Glossary.* A glossary of terms is provided for quick reference.

## ANCILLARIES

*Laboratory Manual.* A new Laboratory Manual accompanies the fifth edition of *Rehabilitation Techniques for Sports Medicine and Athletic Training*. It has been prepared by Dr. Tom Kaminski of the University of Delaware to provide hands-on directed learning experiences for students using the text. It includes practical laboratory exercises designed to enhance student understanding. The Laboratory Manual is available for download at [www.mhhe.com/ptencirehab5e](http://www.mhhe.com/ptencirehab5e)



*Connect Principles of Athletic Training* is a new online learning system composed of interactive exercises and assessments, like those that appear on the NATA's new Board of Certification exam. Videos, animations, and other multimedia features will enable students to visualize complicated concepts and practice skills. All of the activities are automatically graded and can be submitted to the instructor's grade book. For more information, visit [www.mcgrawhillconnect.com](http://www.mcgrawhillconnect.com)

## TO THE STUDENT

*Connect Principles of Athletic Training* is an interactive digital product which can help you study for the NATA's Board of Certification exam. Ask your instructor if this product is available through your bookstore.

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Bill Prentice

# Contributors

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## **Jolene Bennett, MA, PT, OCS, ATC, CertMDT**

Clinical Specialist for Orthopedics and Sports Medicine  
Spectrum Health Rehabilitation and Sports Medicine  
Visser Family YMCA  
Grandville, Michigan

## **Michelle Boling, PhD, LAT, ATC**

Assistant Professor  
Department of Athletic Training and Physical Therapy  
University of North Florida  
Jacksonville, Florida

## **Michael Clark, DPT, MS, PT, PES, CES**

President and Chief Executive Officer  
National Academy of Sports Medicine  
Phoenix, AZ

## **Bernard DePalma, MEd, PT, ATC**

Head Athletic Trainer  
Cornell University  
Ithaca, New York

## **Freddie Fu, MD**

Chairman and David Silver Professor for the Department  
of Orthopaedic Surgery  
University of Pittsburgh School of Medicine and  
University of Pittsburgh Medical Center  
Head Team Physician  
University of Pittsburgh  
Pittsburgh, Pennsylvania

## **Joe Gieck, EdD, PT, ATC**

Professor Emeritus, Sports Medicine  
University of Virginia  
Charlottesville, Virginia

## **Kevin Guskiewicz, PhD, ATC, FNATA**

Chairman and Professor  
Department of Exercise and Sport Science  
University of North Carolina  
Chapel Hill, North Carolina

## **Doug Halverson, MA, ATC, CSCS**

Staff Athletic Trainer  
Campus Health Service  
Division of Sports Medicine  
University of North Carolina  
Chapel Hill, North Carolina

## **Elizabeth Hedgpeth, EdD**

Lecturer, Sport Psychology  
Department of Exercise and Sport Science  
University of North Carolina  
Chapel Hill, North Carolina

## **Christopher Hirth, MSPT, PT, ATC**

Staff Physical Therapist/Athletic Trainer  
Campus Health Service  
Division of Sports Medicine  
University of North Carolina  
Chapel Hill, North Carolina

## **Barbara Hoogenboom, EdD, PT, SCS, ATC**

Associate Professor  
Physical Therapy Program  
Grand Valley State University  
Grand Rapids, Michigan

## **Daniel Hooker, PhD, PT, ATC**

Associate Director of Sports Medicine  
Coordinator of Physical Therapy and Athletic Training

Division of Sports Medicine  
University of North Carolina  
Chapel Hill, North Carolina

### **Stuart (Skip) Hunter, PT, ATC**

Clemson Sports Medicine  
Clemson, South Carolina

### **Kellie C. Huxel, PhD, ATC**

Assistant Professor  
Interdisciplinary Health Sciences  
A.T. Still University  
Arizona School of Health Sciences  
Mesa, Arizona

### **Scott Lephart, PhD, ATC**

Chair and Associate Professor  
Director, Neuromuscular Research Laboratory  
Department of Sports Medicine and Nutrition  
School of Health and Rehabilitation Sciences  
Associate Professor of Orthopaedic Surgery  
University of Pittsburgh  
Pittsburgh, Pennsylvania

### **Nancy Lomax, PT**

Staff Physical Therapist  
Spectrum Health Rehabilitation and Sports  
Medicine Services  
Visser Family YMCA  
Grandville, Michigan

### **Michael McGee, EdD, LAT, ATC**

Chair, School of Health, Exercise and Sport Science  
Athletic Training Education Program  
Director and Head Athletic Trainer  
Lenoir-Rhyne University  
Hickory, North Carolina

### **Joseph Myers, PhD, ATC**

Associate Professor  
Department of Exercise and Sport Science  
University of North Carolina  
Chapel Hill, North Carolina

### **James Onate, PhD, ATC**

Assistant Professor  
Director, Sports Medicine Research Laboratory, Old  
Dominion University  
Old Dominion University  
Norfolk, Virginia

### **Darin Padua, PhD, ATC**

Associate Professor  
Department of Exercise and Sport Science  
University of North Carolina  
Chapel Hill, North Carolina

### **William Prentice, PhD, PT, ATC, FNATA**

Professor, Coordinator of Sports Medicine Specialization  
Department of Exercise and Sport Science  
University of North Carolina  
Chapel Hill, North Carolina

### **Terri Jo Rucinski, MA, PT, ATC**

Staff Physical Therapist/Athletic Trainer  
Campus Health Service  
Division of Sports Medicine  
University of North Carolina  
Chapel Hill, North Carolina

### **Anne Marie Schneider OTR/L, CHT**

Certified Hand Therapist/Office Manager  
Balanced Physical Therapy  
Carrboro/Durham, North Carolina

### **Rob Schneider PT, MS, LAT, ATC**

Co-owner Balanced Physical Therapy  
Carrboro/Durham, North Carolina

### **Steven Tippett, PhD, PT, SCS, ATC**

Professor and Department Chair  
Department of Physical Therapy and Health Science  
Bradley University  
Peoria, Illinois

**C. Buz Swanik, PhD, ATC**

Associate Professor  
College of Health Sciences  
University of Delaware  
Newark, Delaware

**Michael Voight, PT, DHSc, SCS, OCS,  
ATC, CSCS**

Professor  
School of Physical Therapy  
Belmont University  
Nashville, Tennessee

**Steven Zinder, PhD, ATC**

Assistant Professor  
Department of Exercise and Sport Science  
University of North Carolina  
Chapel Hill, North Carolina

**Pete Zulia, PT, SCS, ATC**

Co-founding Partner  
Oxford Physical Therapy Centers  
Oxford, Ohio



# Brief Contents

---

## **PART ONE** The Basis of Injury Rehabilitation

---

- 1** Essential Considerations in Designing a Rehabilitation Program for the Injured Patient 1
- 2** Understanding and Managing the Healing Process through Rehabilitation 18
- 3** The Evaluation Process in Rehabilitation 46
- 4** Psychological Considerations for Rehabilitation of the Injured Patient 71

## **PART TWO** Achieving the Goals of Rehabilitation

---

- 5** Establishing Core Stability in Rehabilitation 97
- 6** Reestablishing Neuromuscular Control 122
- 7** Regaining Postural Stability and Balance 144
- 8** Restoring Range of Motion and Improving Flexibility 175
- 9** Regaining Muscular Strength and Endurance 197
- 10** Maintaining Aerobic Capacity and Endurance during Rehabilitation 214

## **PART THREE** The Tools of Rehabilitation

---

- 11** Plyometrics in Rehabilitation 227
- 12** Open- versus Closed-Kinetic-Chain Exercise in Rehabilitation 248

- 13** Joint Mobilization and Traction Techniques in Rehabilitation 267
- 14** Proprioceptive Neuromuscular Facilitation Techniques in Rehabilitation 296
- 15** Aquatic Therapy in Rehabilitation 318
- 16** Functional Progressions and Functional Testing in Rehabilitation 340

## Rehabilitation Techniques for

## **PART FOUR** Specific Injuries

---

- 17** Rehabilitation of Shoulder Injuries 364
- 18** Rehabilitation of Elbow Injuries 418
- 19** Rehabilitation of Wrist, Hand, and Finger Injuries 451
- 20** Rehabilitation of Groin, Hip, and Thigh Injuries 484
- 21** Rehabilitation of Knee Injuries 526
- 22** Rehabilitation of Lower-Leg Injuries 579
- 23** Rehabilitation of Ankle and Foot Injuries 608
- 24** Rehabilitation of Injuries to the Spine 646

**Glossary 692**

**Index 697**

# Contents

---

## **PART ONE** *The Basis of Injury Rehabilitation*

---

### **1** Essential Considerations in Designing a Rehabilitation Program for the Injured Athlete

*William E. Prentice*

The Rehabilitation Team – 2

The Philosophy of Sports Medicine  
Rehabilitation – 4

Establishing Short- and Long-Term Goals in a  
Rehabilitation Program – 7

Documentation in Rehabilitation – 15

Legal Considerations in Supervising a Rehabilitation  
Program – 16

Summary – 16

### **2** Understanding and Managing the Healing Process through Rehabilitation

*William E. Prentice*

Understanding the Healing Process – 18

Injuries to Articular Structures – 24

Injuries to Bone – 28

Injuries to Musculotendinous Structures – 30

Injuries to Nerve Tissue – 34

Additional Musculoskeletal Injuries – 36

Incorporating Therapeutic Exercise to Affect the  
Healing Process – 38

Using Medications to Affect the  
Healing Process – 39

Rehabilitation Philosophy – 41

Summary – 42

### **3** The Evaluation Process in Rehabilitation

*Darin A. Padua*

The Systematic Differential Evaluation Process – 47

Injury Prevention Screening – 63

Documenting Findings – 64

Summary – 69

### **4** Psychological Considerations for Rehabilitation of the Injured Athlete

*Elizabeth G. Hedgpeth*

*Joe Gieck*

Acculturation – 71

Predictors of Injury – 73

Progressive Reactions Depend on Length of  
Rehabilitation – 76

Dealing with Short-Term Injury – 77

Dealing with Long-Term Injury – 78

Dealing with Chronic Injury – 82

Dealing with a Career-Ending Injury – 84

Compliance and Adherence to Rehabilitation – 85

Pain as a Deterrent to Compliance – 88

Return to Competition – 89

Interpersonal Relationship between Athlete and  
Athletic Trainer – 90

Summary – 92

## **PART TWO** *Achieving the Goals of Rehabilitation*

---

### **5** Establishing Core Stability in Rehabilitation

*Mike Clark*

*Barbara J. Hoogenboom*

*Jolene L. Bennett*

What Is the Core? – 98

Core Stabilization Training Concepts – 99

Review of Functional Anatomy – 99

Transversus Abdominus and Multifidus Role in Core  
Stabilization – 103

Postural Considerations – 104

Muscular Imbalances – 104

Neuromuscular Considerations – 105

Scientific Rationale for Core Stabilization Training – 105

Assessment of the Core – 106

Core Stabilization Training Program – 108

Guidelines for Core Stabilization Training – 116

Summary – 117

- 6** Reestablishing Neuromuscular Control  
*Scott Lephart*  
*C. Buz Swanik*  
*Freddie Fu*  
*Kellie Huxel*  
 Why Is Neuromuscular Control Critical to the Rehabilitation Process? – 122  
 What Is Neuromuscular Control? – 123  
 The Physiology of Mechanoreceptors – 124  
 Neural Pathways of Peripheral Afferents – 125  
 Feed-Forward and Feedback Neuromuscular Control – 125  
 Reestablishing Neuromuscular Control – 126  
 Functional Activities – 136  
 Summary – 138
- 7** Regaining Postural Stability and Balance  
*Kevin M. Guskiewicz*  
 Postural Control System – 145  
 Control of Balance – 145  
 Somatosensation as It Relates to Balance – 147  
 Balance as It Relates to the Closed Kinetic Chain – 148  
 Balance Disruption – 148  
 Assessment of Balance – 149  
 Injury and Balance – 154  
 Balance Training – 156  
 Dual-Task Balance Training and Assessment – 168  
 Clinical Value of High-Tech Training and Assessment – 170  
 Summary – 170
- 8** Restoring Range of Motion and Improving Flexibility  
*William E. Prentice*  
 Importance of Flexibility to the Patient – 176  
 Anatomic Factors That Limit Flexibility – 176  
 Active and Passive Range of Motion – 177  
 Stretching to Improve Mobility – 178  
 Neurophysiologic Basis of Stretching – 179  
 Effects of Stretching on the Physical and Mechanical Properties of Muscle – 179  
 Effects of Stretching on the Kinetic Chain – 180  
 Importance of Increasing Muscle Temperature Prior to Stretching – 180  
 Stretching Techniques – 180  
 Specific Stretching Exercises – 183  
 Alternative Stretching Techniques – 184  
 Manual Therapy Techniques for Increasing Mobility – 186  
 Summary – 193
- 9** Regaining Muscular Strength and Endurance  
*William E. Prentice*  
 Types of Skeletal Muscle Contraction – 198  
 Factors That Determine Levels of Muscular Strength, Endurance, and Power – 198  
 The Physiology of Strength Development – 200  
 Techniques of Resistance Training – 201  
 Core Stabilization Strengthening – 209  
 Training for Muscular Strength versus Muscular Endurance – 209  
 Resistance Training Differences between Males and Females – 210  
 Resistance Training in the Adolescent – 210  
 Specific Resistive Exercises Used in Rehabilitation – 210  
 Summary – 211
- 10** Maintaining Aerobic Capacity and Endurance during Rehabilitation  
*William E. Prentice*  
 Training Effects on the Cardiorespiratory System – 215  
 Maximal Aerobic Capacity – 217  
 Producing Energy for Exercise – 219  
 Techniques for Maintaining Cardiorespiratory Endurance – 220  
 Combining Continuous and Interval Training – 222  
 Caloric Thresholds and Targets – 223  
 Detraining – 223  
 Summary – 223
- PART THREE** *The Tools of Rehabilitation*  
 .....
- 11** Plyometrics in Rehabilitation  
*Steve Tippet*  
*Michael Voight*  
 What Is Plyometric Exercise? – 228  
 Biomechanical and Physiological Principles of Plyometric Training – 229  
 Program Development – 232  
 Plyometric Program Design – 234  
 Guidelines for Plyometric Programs – 236  
 Integrating Plyometrics into the Rehabilitation Program: Clinical Concerns – 237  
 Specific Plyometric Exercises – 238  
 Summary – 245
- 12** Open- versus Closed-Kinetic-Chain Exercise in Rehabilitation  
*William E. Prentice*

Concept of the Kinetic Chain – 249  
Advantages and Disadvantages of Open- versus Closed-Kinetic-Chain Exercises – 249  
Using Closed-Kinetic-Chain Exercises to Regain Neuromuscular Control – 250  
Biomechanics of Open- versus Closed-Kinetic-Chain Activities in the Lower Extremity – 251  
Closed-Kinetic-Chain Exercises for Rehabilitation of Lower-Extremity Injuries – 253  
Biomechanics of Open- versus Closed-Kinetic-Chain Activities in the Upper Extremity – 257  
Open- and Closed-Kinetic-Chain Exercises for Rehabilitation of Upper-Extremity Injuries – 258  
Summary – 262

**13** Joint Mobilization and Traction Techniques in Rehabilitation  
*William E. Prentice*  
Relationship between Physiological and Accessory Motions – 267  
Joint Arthrokinematics – 268  
Joint Positions – 270  
Joint Mobilization Techniques – 270  
Joint Traction Techniques – 274  
Mobilization and Traction Techniques – 275  
Mulligan Joint Mobilization Technique – 291  
Summary – 292

**14** Proprioceptive Neuromuscular Facilitation Techniques in Rehabilitation  
*William E. Prentice*  
PNF as a Technique for Improving Strength and Enhancing Neuromuscular Control – 296  
Basic Principles of PNF – 297  
Basic Strengthening Techniques – 298  
PNF Patterns – 300  
PNF as a Technique of Stretching for Improving Range of Motion – 310  
Muscle Energy Techniques – 313  
Summary – 314

**15** Aquatic Therapy in Rehabilitation  
*Barbara Hoogenboom*  
*Nancy Lomax*  
Physical Properties and Resistive Forces – 319  
Advantages and Benefits of Aquatic Rehabilitation – 323  
Disadvantages of Aquatic Rehabilitation – 325  
Facilities and Equipment – 326  
Water Safety – 328  
Aquatic Techniques – 328  
Special Techniques – 335  
Conclusions – 336  
Summary – 336

**16** Functional Progressions and Functional Testing in Rehabilitation  
*Michael McGee*  
The Role of Functional Progressions in Rehabilitation – 340  
Benefits of Using Functional Progressions – 341  
Psychological and Social Considerations – 342  
Components of a Functional Progression – 343  
Designing a Functional Progression – 344  
Functional Testing – 345  
Examples of Functional Progressions and Testing – 346  
Carolina Functional Performance Index (CFPI) – 358  
Applying Functional Progressions to a Specific Sport Case – 358  
Conclusion – 359  
Summary – 359

## Rehabilitation Techniques for Specific Injuries

### PART FOUR

**17** Rehabilitation of Shoulder Injuries  
*Rob Schneider*  
*Joseph B. Myers*  
*Terri Jo Rucinski*  
Functional Anatomy and Biomechanics – 364  
Rehabilitation Techniques for the Shoulder – 376  
Rehabilitation Techniques for Specific Injuries – 389  
Summary – 411

**18** Rehabilitation of Elbow Injuries  
*Pete Zulia*  
*William E. Prentice*  
Functional Anatomy and Biomechanics – 418  
Rehabilitation Techniques for the Elbow Complex – 422  
Rehabilitation Techniques for Specific Injuries – 433  
Aquatic Therapy Techniques to Assist in the Rehabilitation of the Elbow – 444  
Throwing Program for Return to Sport – 446  
Summary – 447

**19** Rehabilitation of Wrist, Hand, and Finger Injuries  
*Anne Marie Schneider*  
Functional Anatomy and Biomechanics – 451  
The Hand – 452  
Rehabilitation Techniques for Specific Injuries – 453  
Summary – 481

**20** Rehabilitation of Groin, Hip, and Thigh Injuries*Bernie DePalma**Doug Halverson*

Functional Anatomy and Biomechanics – 484

Rehabilitation Techniques for the Groin, Hip,  
and Thigh – 487Rehabilitation Techniques for Acute Groin, Hip,  
and Thigh Injuries – 500

Chronic Groin, Hip and Thigh Injuries – 517

Summary – 523

**21** Rehabilitation of Knee Injuries*Darin A. Padua**Michelle C. Boling**William E. Prentice*

Functional Anatomy and Biomechanics – 526

Rehabilitation Techniques – 529

Rehabilitation Techniques for Ligamentous  
and Meniscal Injuries – 541Rehabilitation Techniques for Patellofemoral  
and Extensor Mechanism Injuries – 555

Summary – 572

**22** Rehabilitation of Lower-Leg Injuries*Christopher J. Hirth*

Functional Anatomy and Biomechanics – 579

Rehabilitation Techniques for the Lower Leg – 580

Rehabilitation Techniques for Specific Injuries – 590

Summary – 603

**23** Rehabilitation of Ankle and Foot Injuries*Skip Hunter**Steven M. Zinder**William E. Prentice*

Functional Anatomy and Biomechanics – 608

Rehabilitation Techniques – 611

Rehabilitation Techniques for Specific Injuries – 621

Summary – 641

**24** Rehabilitation of Injuries to the Spine*Daniel N. Hooker**William E. Prentice*

Functional Anatomy and Biomechanics – 646

The Importance of Evaluation in Treating

Back Pain – 648

Rehabilitation Techniques for the Low Back – 651

Spinal Segment Control Exercise – 651

Rehabilitation Techniques for Low Back Pain – 665

Rehabilitation Techniques for Thoracic Spine

Conditions – 681

Rehabilitation Techniques for the Cervical Spine – 683

Summary 687

**Glossary – 692****Index – 697**

## **PART ONE**

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# **The Basis of Injury Rehabilitation**

- 1 Essential Considerations in Designing a Rehabilitation Program for the Injured Patient**
- 2 Understanding and Managing the Healing Process through Rehabilitation**
- 3 The Evaluation Process in Rehabilitation**
- 4 Psychological Considerations for Rehabilitation of the Injured Patient**

# CHAPTER 1

## Essential Considerations in Designing a Rehabilitation Program for the Injured Patient

William E. Prentice

**After completing this chapter, the athletic training student should be able to do the following:**

- Describe the relationships among the members of the rehabilitation team: the athletic trainers, team physicians, coaches, strength and conditioning specialists, athlete, and athlete's family.
- Express the philosophy of the rehabilitative process in a sports medicine environment.
- Realize the importance of understanding the healing process, the biomechanics, and the psychological aspects of a rehabilitation program.
- Arrange the individual short-term and long-term goals of a rehabilitation program.
- Discuss the components that should be included in a well-designed rehabilitation program.
- Propose the criteria and the decision-making process for determining when the injured patient may return to full activity.

One of the primary goals of every sports medicine professional is to create a playing environment that is as safe as it can possibly be. Regardless of that effort, the nature of participation in sport and physical activity dictates that injuries will eventually occur. Fortunately, few of the injuries that occur in an athletic setting are life-threatening. The majority of the injuries are not serious and lend themselves to rapid rehabilitation. When injuries do occur, the focus of the athletic trainer shifts from injury prevention to injury treatment and rehabilitation. In a sports medicine setting, the athletic trainer generally assumes primary responsibility for the design, implementation, and supervision of the rehabilitation program for the injured athlete.

The athletic trainer responsible for overseeing an exercise rehabilitation program must have as complete an understanding of the injury as possible, including knowledge of how the injury was sustained, the major anatomical structures affected, the degree or grade of trauma, and the stage or phase of the injury's healing.<sup>2,12</sup>

### THE REHABILITATION TEAM

Providing a comprehensive rehabilitation program for an injured patient in an athletic environment requires a group effort to be most effective. The rehabilitation process requires communication among a number of individuals, each of whom must perform specific functions relative to caring for the injured athlete. Under ideal conditions, the athletic trainer (and the athletic training students), the athlete, the physician, the coaches, the strength and conditioning specialist, and the injured athlete's family will communicate freely and function as a team. This group is intimately involved with the rehabilitative process, beginning with patient assessment, treatment selection, and implementation, and ending

with functional exercises and return to activity. The athletic trainer directs the post-acute phase of the rehabilitation, and it is essential that the patient understand that this part of the recovery is just as crucial as surgical technique to the return of normal joint function and the subsequent return to full activity. All decisions made by the physician, the athletic trainer, and the coaches which dictate the course of rehabilitation ultimately affect the injured patient.

### CLINICAL DECISION MAKING

#### Exercise 1-1

A team physician has diagnosed a swimmer with thoracic outlet syndrome. The athletic trainer is developing a rehabilitation plan for this patient. What considerations must be taken into account?

.....

Of all the members of the rehabilitation team charged with providing health care, perhaps none is more intimately involved than the athletic trainer. The athletic trainer is the one individual who deals directly with the patient throughout the entire period of rehabilitation, from the time of the initial injury until the complete, unrestricted return to activity. The athletic trainer is most directly responsible for all phases of health care in an athletic environment, including preventing injuries from occurring, providing initial first aid and injury management, evaluating and diagnosing injuries, and designing and supervising a timely and effective program of rehabilitation that can facilitate the safe and expeditious return to activity.

In 2004 the Board of Certification (BOC) completed the latest role delineation study, which defines the profession of athletic training. This study was designed to examine the primary tasks performed by the entry-level athletic trainer and the knowledge and skills required to perform each task. The panel determined that the roles of the practicing athletic trainer could be divided into six major areas or performance domains: prevention; clinical evaluation and diagnosis; immediate care; organization and administration; professional responsibilities; and treatment, rehabilitation, and reconditioning.

An athletic trainer must work closely with and under the supervision of the team physician with respect to designing rehabilitation and reconditioning protocols that make use of appropriate therapeutic exercise, rehabilitative equipment, manual therapy techniques, or therapeutic modalities. The athletic trainer should then assume the responsibility of overseeing the rehabilitative process, ultimately returning the patient to full activity.

Certainly, the athletic trainer has an obligation to the patient to understand the nature of the injury, the function of the structures damaged, and the different tools available

to safely rehabilitate that patient. Additionally, the athletic trainer must understand the treatment philosophy of the patient's physician and be careful in applying different treatment regimens because what may be a safe but outdated technique in the opinion of one physician may be the treatment of choice to another. The successful athletic trainer must demonstrate flexibility in his or her approach to rehabilitation by incorporating techniques that are evidence-based and effective, but somewhat variable from one patient to another, as well as from one physician to another.

Communication is crucial to prevent misunderstandings and a subsequent loss of rapport with either the patient or the physician. The patient must always be informed and made aware of the why, how, and when factors that collectively dictate the course of an injury rehabilitation program.

Any personal relationship takes some time to grow and develop. The relationship between the coach and the athletic trainer is no different. The athletic trainer must demonstrate to the coach his or her capability to correctly manage an injury and guide the course of a rehabilitation program. It will take some time for the coach to develop trust and confidence in the athletic trainer. The coach must understand that what the athletic trainer wants is exactly the same as what the coach wants—to get an injured patient healthy and back to practice as quickly and safely as possible.

This is not to say, however, that the coaches should not be involved with the decision-making process. For example, when a patient is rehabilitating an injury, there may be drills or technical instruction sessions that the individual can participate in without exacerbating the injury. Thus the coaches, athletic trainer, and team physician should be able to negotiate what that individual can and cannot do safely in the course of a practice.

Athletes are frequently caught in the middle between coaches who tell them to do one thing and medical staff who tell them something else. The athletic trainer must respect the job that the coach has to do and should do whatever can be done to support the coach. Close communication between the coach and the athletic trainer is essential so that everyone is on the same page.

### CLINICAL DECISION MAKING

#### Exercise 1-2

A gymnast has just had an anterior cruciate ligament (ACL) reconstruction. The orthopedist has prescribed some active range of motion (AROM) exercises to start the rehabilitation process. The patient is progressing very quickly and wants to increase the intensity of her activity. What should the athletic trainer do to address the patient's request?

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When rehabilitating an injured patient, particularly in a high school or junior high school setting, the athletic trainer, the coach, and the physician must take the time to explain and inform the patient's parents about the course of the injury rehabilitation process. With a patient of secondary school age, the parents' decisions regarding health care must be of primary consideration. In certain situations, particularly at the high school and middle school levels, many parents will insist that their child be seen by their family physician rather than by the individual who may be designated as the team physician. This creates a situation in which the athletic trainer must work and communicate with many different "team physicians." The opinion of the family physician must be respected even if that individual has little or no experience with injuries related to sports.

It should be clear that the physician working in cooperation with the athletic trainer assumes the responsibility of making the final decisions relative to the course of rehabilitation for the patient from the time of injury until full return to activity. The coaches must defer to and should support the decisions of the medical staff in any matter regarding the course of the rehabilitative process.

## THE PHILOSOPHY OF SPORTS MEDICINE REHABILITATION

The approach to rehabilitation is considerably different in a sports medicine environment than in most other rehabilitation settings.<sup>1</sup> The competitive nature of athletics necessitates an aggressive approach to rehabilitation. Because the competitive season in most sports is relatively short, the patient does not have the luxury of being able to sit around and do nothing until the injury heals. The goal is to return to activity as soon as is safely possible. Consequently, the athletic trainer tends to play games with the healing process, never really allowing enough time for an injury to completely heal. The athletic trainer who is supervising the rehabilitation program usually performs a "balancing act"—walking along a thin line between not pushing the patient hard enough or fast enough and being overly aggressive. In either case, a mistake in judgment on the part of the athletic trainer can hinder return to activity.

### Understanding the Healing Process

Decisions as to when and how to alter or progress a rehabilitation program should be based primarily on the process of injury healing. The athletic trainer must possess a sound understanding of both the sequence and

the time frames for the various phases of healing, realizing that certain physiological events must occur during each of the phases. Anything that is done during a rehabilitation program that interferes with this healing process will likely increase the length of time required for rehabilitation and slow return to full activity. The healing process must have an opportunity to accomplish what it is supposed to. At best the athletic trainer can only try to create an environment that is conducive to the healing process. Little can be done to speed up the process physiologically, but many things can impede healing (see Chapter 2).

**Exercise Intensity.** The **SAID Principle** (an acronym for Specific Adaptation to Imposed Demand) states that when an injured structure is subjected to stresses and overloads of varying intensities, it will gradually adapt over time to whatever demands are placed upon it.<sup>14</sup> During the rehabilitation process, the stresses of reconditioning exercises must not be so great as to exacerbate the injury before the injured structure has had a chance to adapt specifically to the increased demands. Engaging in exercise that is too intense or too prolonged can be detrimental to the progress of rehabilitation. Indications that the intensity of the exercises being incorporated into the rehabilitation program exceed the limits of the healing process include an increase in the amount of swelling, an increase in pain, a loss or a plateau in strength, a loss or a plateau in range of motion, or an increase in the laxity of a healing ligament.<sup>23</sup> If an exercise or activity causes any of these signs, the athletic trainer must back off and become less aggressive in the rehabilitation program.

#### CLINICAL DECISION MAKING

#### Exercise 1-3

A baseball player recently underwent surgery to repair a superior labrum anterior and posterior (SLAP) lesion and torn rotator cuff. He wants to know why he can't start throwing right away. What is your reason for why he must progress slowly?

In most injury situations, early exercise rehabilitation involves submaximal exercise performed in short bouts that are repeated several times daily. Exercise intensity must be commensurate with healing. As recovery increases, the intensity of exercise also increases, with the exercise performed less often. Finally, the patient returns to a conditioning mode of exercise, which often includes high-intensity exercise three to four times per week.