

NINTH EDITION

# ESSENTIALS OF Athletic Injury Management



WILLIAM E. PRENTICE

*Essentials of*

# ATHLETIC INJURY MANAGEMENT

---

NINTH EDITION

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

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





ESSENTIALS OF ATHLETIC INJURY MANAGEMENT, NINTH EDITION

Published by McGraw-Hill, a business unit of The McGraw-Hill Companies, Inc., 1221 Avenue of the Americas, New York, NY 10020. Copyright © 2013 by The McGraw-Hill Companies, Inc. Previous editions © 2010, 2008 and 2005. All rights reserved. Printed in the United States of America. No part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written consent of The McGraw-Hill Companies, Inc., including, but not limited to, in any network or other electronic storage or transmission, or broadcast for distance learning.

Some ancillaries, including electronic and print components, may not be available to customers outside the United States.

This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 0 QDB/QDB 1 0 9 8 7 6 5 4 3 2

ISBN 978-0-07-802261-6

MHID 0-07-802261-4

Vice President & Editor-in-Chief: *Michael Ryan*

Publisher: *David Patterson*

Sponsoring Editor: *William Minick*

Development Editor: *Darlene M. Schueller*

Marketing Manager: *Caroline McGillen*

Project Manager: *Erin Melloy*

Design Coordinator: *Brenda A. Rolwes*

Cover Designer: *Studio Montage, St. Louis, MO*

Cover Image: © *William E. Prentice*

Buyer: *Laura Fuller*

Media Project Manager: *Sridevi Palani*

Compositor: *MPS Limited*

Typeface: *10/12 Meridien Roman*

Printer: *Quad/Graphics*

All credits appearing on page or at the end of the book are considered to be an extension of the copyright page.

**Library of Congress Cataloging-in-Publication Data**

Prentice, William E.

Essentials of athletic injury management / William E. Prentice.—9th ed.

p. cm.

Includes index.

ISBN 978-0-07-802261-6 (pbk.)

1. Sports medicine. 2. Sports injuries—Prevention. 3. Physical education and training. I. Title.

II. Title: Athletic injury management.

RC1210.A749 2013

617.1'027—dc23

2012007044



## WHO SHOULD USE THIS TEXT?

The majority of students who take courses about the prevention and management of injuries that typically occur in an athletic population have little or no intention of pursuing athletic training as a career. However, it is also true that a large percentage of those students who are taking these courses are doing so because they intend to pursue careers in coaching, fitness, physical education, or other areas related to exercise and sports science. For these individuals, some knowledge and understanding of the many aspects of health care for both recreational and competitive athletes is essential for them to effectively perform the associated responsibilities of their job. **The ninth edition of *Essentials of Athletic Injury Management* is written for those students interested in coaching, physical education, and the fitness profession.**

Other students who are personally involved in fitness, or training and conditioning, may be interested in taking a course that will provide them with guidelines and recommendations for preventing injuries, recognizing injuries, and learning how to correctly manage a specific injury. Thus, *Essentials of Athletic Injury Management* has been designed to provide basic information on a variety of topics, all of which relate in one way or another to health care for the athlete.

*Essentials of Athletic Injury Management* was created from the foundations established by another well-recognized textbook, *Principles of Athletic Training*, currently in its fifteenth edition. Whereas *Principles of Athletic Training* serves as a major text for professional athletic trainers and those individuals interested in sports medicine, *Essentials of Athletic Injury Management* is written at a level more appropriate for the coach, fitness professional, and physical educator. It provides guidance, suggestions, and recommendations for handling athletic health care situations when an athletic trainer or physician is not available.

## ORGANIZATION AND COVERAGE

The ninth edition of *Essentials of Athletic Injury Management* provides the reader with the most current information possible on the subject of prevention and basic care of sports injuries. The general philosophy of the text is that adverse effects of

physical activity arising from participation in sport should be prevented to the greatest extent possible. However, the nature of participation in physical activity dictates that sooner or later injury may occur. In these situations, providing immediate and correct care can minimize the seriousness of an injury.

Overall, this text is designed to take the beginning student from general to more specific concepts. Each chapter focuses on promoting an understanding of the prevention and care of athletic injuries.

*Essentials of Athletic Injury Management* is divided into four parts: *Organizing and Establishing an Effective Athletic Health Care System*, *Preventing Injuries in an Athletic Health Care System*, *Techniques for Treating and Managing Sport-Related Injury*, and *Recognition and Management of Specific Injuries and Conditions*.

Part I, *Organizing and Establishing an Effective Athletic Health Care System*, begins in Chapter 1 with a discussion of the roles and responsibilities of all the individuals on the “sports medicine team” who in some way affect the delivery of health care to the athlete. Chapter 2 provides guidelines and recommendations for setting up a system for providing athletic health care in situations where an athletic trainer is not available to oversee that process. In today’s society, and in particular for anyone who is remotely involved with providing athletic health care, the issue of legal responsibility and, perhaps more importantly, legal liability is of utmost concern. Chapter 3 discusses ways to minimize the chances of litigation and also to make certain that both the athlete and anyone who is in any way involved in providing athletic health care are protected by appropriate insurance coverage.

Part II, *Preventing Injuries in an Athletic Health Care System*, discusses a variety of topics that both individually and collectively can reduce the chances for injury to occur. Chapter 4 emphasizes the importance of making certain that the athlete is fit to prevent injuries. Chapter 5 discusses the importance of a healthy diet, giving attention to sound nutritional practices and providing sound advice on the use of dietary supplements. Chapter 6 provides guidelines for selecting and using protective equipment. Chapter 7 looks at ways to minimize the potentially negative threats of various environmental conditions on the health of the athlete.

Part III, *Techniques for Treating and Managing Sport-Related Injuries*, begins with Chapter 8, which

details how to assess the severity of an injury and then provides specific steps that should be taken to handle emergency situations. Chapter 9 provides guidelines that can help reduce the chances of spreading infectious diseases by taking universal precautions in dealing with bloodborne pathogens. Chapter 10 discusses the more common wrapping and taping techniques that can be used to prevent new injuries from occurring and old ones from becoming worse. Chapter 11 includes a brief discussion of the general techniques that may be used in rehabilitation following injury. Chapter 12 discusses the psychology of preparing to compete and proposes recommendations for how a coach should manage an injury.

Part IV, *Recognition and Management of Specific Injuries and Conditions*, begins with Chapter 13, which defines and classifies the various types of injuries that are most commonly seen in the physically active population.

Chapters 14 through 22 discuss injuries that occur in specific regions of the body, including the foot; the ankle and lower leg; the knee; the hip, thigh, groin, and pelvis; the shoulder; the elbow, wrist, forearm, and hand; the spine; the thorax and abdomen; and the head, face, eyes, ears, nose, and throat. Injuries are discussed individually in terms of their most common causes, the signs of injury you would expect to see, and a basic plan of care for that injury. Chapter 23 provides guidelines and suggestions for managing various illnesses and other health conditions that may affect athletes and their ability to play and compete. Chapter 24 focuses specifically on issues related to substance abuse and the potential effects on the athlete. Chapter 25 provides special considerations for injuries that may occur in young athletes.

## NEW TO THIS EDITION

When you open the first pages of the ninth edition, it becomes immediately apparent that the book has significantly changed its appearance. *Essentials* is now in full color and has moved to a double-column layout that will help minimize wasted white space in the book. All of the line drawings and photos in the book are now in color, which makes it much easier to see details in each photograph, thereby enhancing the visual learning experience for the student.

### Chapter Changes and Additions

In addition, numerous changes and clarifications have been made in content throughout the entire text.

## Chapter 1

- Added more emphasis on the role of the strength and conditioning coach.
- Reorganized the roles and responsibilities of the athletic trainers according to the latest role delineation study.
- Added new strategies for dealing with athletes who have psychological problems and for referring those individuals to the appropriate health care professional.
- Clarified the relationship between the team physician and the athletic trainer.
- Added nurse practitioner to the list of support personnel for the sports medicine team.

## Chapter 2

- Further explained the roles of coaches, other fitness professionals, and administrators who may have to assume some responsibility in overseeing an athletic health care program in the absence of an athletic trainer.
- Clarified information on how medical records can be released.
- Increased emphasis on hiring an athletic trainer in all secondary schools.

## Chapter 3

- Revised sample insurance form.
- Added information on Medicaid.
- Altered recommendations for things a coach or fitness professional can do to minimize the chances of litigation.

## Chapter 4

- Provided further instruction for incorporating a cool-down period following a workout.
- Clarified the discussion of the relationship that exists between stretching and the rate of injury.
- Clarified the difference between active and passive motion.
- Added a number of new photos that better illustrate the various exercises that may be done in a training and conditioning program to help prevent injuries.

## Chapter 5

- Replaced information on MyPyramid with the newest information on MyPlate.
- Added information on the new, popular energy drinks.



- Changed recommendations on the types of foods to consume in pre-event meals, based on the Glycemic Index.
- Added information on how to most effectively replenish glucose following exercise.
- Redefined bulimia nervosa.

## Chapter 6

- Reorganized information on the technique for properly fitting a football helmet.
- Clarified the statement that mouth guards have little effect in preventing concussions.
- Added a number of new replacement photographs showing the newest available equipment.

## Chapter 7

- Increased emphasis on the importance of taking a rectal temperature to differentiate between heat exhaustion and heat stroke.
- Clarified information on the flash-to-bang ratio during lightening storms.

## Chapter 8

- Reemphasized the importance of having a well-organized and thorough emergency action plan.
- Significantly reduced the amount of information on CPR techniques and instead created a new Focus Box that succinctly summarizes these techniques.

## Chapter 9

- Replaced photos showing the different types of skin wounds.
- Clarified recommendations for cleaning wounds and using antibiotic ointment.

## Chapter 10

- Changed the terminology from *bandaging* to the more contemporary term *wrapping*.
- Added new photos for each wrapping and taping technique discussed.

## Chapter 11

- Added many new replacement photographs to better illustrate the exercises used in rehabilitation.
- Added a new Focus Box to briefly describe the various therapeutic modalities used in a rehabilitation program.

## Chapter 13

- Added expanded information to eliminate confusion among the terms *tendinitis*, *tendinosis*, and *tendinopathy*.
- Included several replacement photographs to better illustrate the various types of injuries.

## Chapter 14

- Included many new line drawings that better illustrate the anatomy associated with the foot.

## Chapter 15

- Clarified information on tendinitis based on definition provided in an earlier chapter.
- Included new information on the Thompson test to look for a ruptured Achilles tendon.
- Added a number of replacement photos that better illustrate the various injuries in the ankle and lower leg.

## Chapter 16

- Clarified the function of the ACL and PCL in knee stability.

## Chapter 17

- Reduced the number of labels in line drawings to make the anatomy less intimidating.
- Clarified the procedures that should be used in a correctly performed Thomas test.
- Deleted discussion of femoral stress fractures because they are uncommon.

## Chapter 18

- Added new photos showing correct throwing technique.
- Added new photos and line drawings to better depict the injuries being discussed.

## Chapter 19

- Added new photos that better show the various injuries being discussed.

## Chapter 20

- Added new photo that correctly depicts a sacral distraction test.

## Chapter 21

- Eliminated many labels in line drawings to make the anatomy less confusing.
- Clarified the distinction between a hernia and a sports hernia.
- Added new information on gallstones.
- Added new information on gynecologic injuries.

## Chapter 22

- Added new information on computerized neuropsychological assessments.
- Updated and added new information about evaluating and managing concussions.
- Updated information on managing tooth injuries.
- Updated information on managing nose bleeds.

## Chapter 23

- Added new replacement photos for several dermatologic conditions that better show exactly what these conditions look like.
- Added new Focus Box on how to prevent the spread of MRSA.
- Added recommendation for everyone to get a yearly flu shot.
- Added new NCAA requirement for sickle-cell testing.

## Chapter 24

- Based on reviewer consensus, eliminated the discussion on abuse of recreational drugs and focused on performance-enhancing drugs.
- Expanded the discussion of drug testing.
- Added a Focus Box on drugs banned by the NCAA and the USADA.

## Chapter 25

- Updated statistics on injuries in youth sports.
- Added new table on Sports Injury Prevention Tips.
- Added new Sports Parents Safety Checklist.
- Expanded information on recommendation for limiting pitch count in baseball to reduce shoulder and elbow injuries in young athletes.

## Appendix C

- New appendix that shows the directional anatomic motion of the joints discussed in this text.

## PEDAGOGICAL FEATURES

- *Chapter objectives.* Objectives are presented at the beginning of each chapter, to reinforce learning goals.
- *Focus Boxes.* Important information is highlighted to provide additional content that supplements the main text.
- *Margin information.* Key concepts, selected definitions and pronunciation guides, helpful training tips, and illustrations are placed in

margins throughout the text for added emphasis and ease of reading and studying.

- *Illustrations and photographs.* Every illustration and photograph throughout the book is now in full color, with over 100 new photographs that will help to enhance the visual learning experience for the student.
- *Critical thinking exercises.* Included in every chapter, these brief case studies correspond with the accompanying text and help students apply the content just learned. Solutions for each exercise are located at the end of the chapters.
- *Athletic Injury Management Checklists.* New checklists prepared specifically to help organize the details of a specific procedure when managing athletic health care.
- *Chapter summaries.* Chapter content is summarized and bulleted to reinforce key concepts and aid in test preparation.
- *Review questions and class activities.* A list of questions and suggested class activities follows each chapter for review and application of the concepts learned.
- *References.* All chapters have a bibliography of pertinent references that includes the most complete and up-to-date resources available.
- *Annotated bibliography.* To further aid in learning, relevant and timely articles, books, and topics from the current literature have been annotated to provide additional resources.
- *Web sites.* A list of useful Web sites is included to direct the student to additional relevant information that can be found on the Internet.
- *Color throughout the text.* The text has been completely redone in full four-color format to enhance overall appearance and accentuate and clarify illustrations.
- *Glossary.* A comprehensive list of key terms with their definitions is presented at the end of the text.
- *Appendixes.* For those students interested in learning more about athletic training, Appendixes A and B provide information about employment settings for the athletic trainer and the requirements for certification as an athletic trainer. Appendix C shows the directional anatomic motions of the joints discussed in this text.

## INSTRUCTOR'S RESOURCE MATERIALS

### Computerized Test Bank

McGraw-Hill's Computerized Testing is the most flexible and easy-to-use electronic testing program available in higher education. The program allows



instructors to create tests from book-specific test banks. It accommodates a wide range of question types, and instructors may add their own questions. Multiple versions of the test can be created. It is located in the Online Learning Center.

### PowerPoint Presentation

Developed for the ninth edition by Jason S. Scibek, Ph.D., ATC, from Duquesne University, a comprehensive and extensively illustrated PowerPoint presentation accompanies this text, for use in classroom discussion. The PowerPoint presentation may also be converted to outlines and given to students as a handout. You can easily download the PowerPoint presentation from the McGraw-Hill Web site at [www.mhhe.com/prentice9e](http://www.mhhe.com/prentice9e). Adopters of the text can obtain the log-in and password to access this presentation by contacting your local McGraw-Hill sales representative.

## INTERNET RESOURCES

### Online Learning Center

**[www.mhhe.com/prentice9e](http://www.mhhe.com/prentice9e)** This Web site offers resources to students and instructors. It includes downloadable ancillaries, Web links, student quizzes, additional information on topics of interest, and more. Resources for the instructor include:

- Instructor's Manual
- Downloadable PowerPoint presentations
- Links to professional resources

Resources for the student include:

- Flashcards
- Review materials
- Interactive quizzes

## MCGRAW-HILL CREATE™



Craft your teaching resources to match the way you teach! With McGraw-Hill Create, you can easily rearrange chapters, combine material from other content sources, and quickly upload content you have written such as your course syllabus or teaching notes. Find the content you need in Create by searching through thousands of leading McGraw-Hill textbooks. Arrange your book to fit your teaching style. Create even allows you to personalize your book's appearance by selecting the cover and adding your name, school, and course information. Order a Create book and you'll receive a complimentary print review copy in 3 to 5 business days or a complimentary electronic review copy (eComp) via email in

minutes. Go to [www.mcgrawhillcreate.com](http://www.mcgrawhillcreate.com) today, and register to experience how McGraw-Hill Create empowers you to teach *your* students *your* way.

## ELECTRONIC TEXTBOOK OPTION

This text is offered through CourseSmart for both instructors and students. CourseSmart is an online resource where students can purchase the complete text online at almost half the cost of a traditional text. Purchasing the eTextbook allows students to take advantage of CourseSmart's web tools for learning, which include full text search, notes and highlighting, and email tools for sharing notes between classmates. To learn more about CourseSmart options, contact your sales representative or visit [www.CourseSmart.com](http://www.CourseSmart.com).

## ACKNOWLEDGMENTS

Special thanks are extended to Gary O'Brien, my Development Editor and most importantly my "wing-man" on this and several additional projects. As always he has provided invaluable guidance in the preparation of the ninth edition of *Essentials of Athletic Injury Management* and I cannot think him enough for everything he does for me.

I would also like to thank the following individuals who served as reviewers for their input into the revision of this text:

**Danny T. Foster**

The University of Iowa

**Brian Gerlach**

University of Indianapolis

**Katie Grove**

Indiana University

**Nadia Hamad**

Ferrum College

**Ky E. Kugler, EdD, ATC**

Chapman University

**Theresa Mackey**

Minnesota State University, Mankato

**Angela M. Perusek**

The College of Mount St. Joseph

**David Tomchuk, MS, ATC, LAT, CSCS**

Missouri Valley College

**Steven V. Winter**

Sonoma State University

Finally, I would like to thank my family, Tena, Brian, and Zach, for always being an important part of everything I do.

**William E. Prentice**



# Applications at a Glance

- List of professional sports medicine organizations 4
- Clarifying roles 8
- Athletic injury management checklist 13
- Looking to hire a certified athletic trainer? 17
- Rules and policies of the athletic health care facility 18
- Suggestions for maintaining a sanitary environment 18
- Cleaning responsibilities 19
- Recommended health practices checklist 19
- Sample emergency action plan 20
- Orthopedic Screening Examination 22
- Recommended basic health care facility supplies 27
- Recommended basic field kit supplies 28
- Athletic injury management checklist 29
- Athletic injury management checklist 34
- Athletic injury management checklist 39
- Periodization training 43
- Principles of conditioning 44
- Guidelines and precautions for stretching 48
- Techniques for improving muscular strength 58
- Progressive resistance exercise terminology 60
- Comparison of aerobic versus anaerobic activities 73
- Rating of perceived exertion 76
- Athletic injury management checklist 77
- Vitamins 84
- Major minerals 86
- Most widely used herbs and purposes for use 91
- Tips for selecting fast foods 95
- Guidelines for weight loss 97
- Recognizing the individual with disordered eating 98
- Athletic injury management checklist 99
- Equipment regulatory agencies 103
- Guidelines for purchasing and reconditioning helmets 104
- Proper football helmet fit 106
- Rules for fitting football shoulder pads 111
- Shoe comparisons 116
- Athletic injury management checklist 120
- WBGT index and recommendations for fluid replacement and work/rest periods 125
- Summary and comparison of heat disorders, treatment and prevention 126
- Recommendations for fluid replacement 129
- Recommendations for preventing heat illness 130
- Athletic injury management checklist 133
- Consent form for medical treatment of a minor 140
- CPR summary 143
- Vital signs 146
- Initial management of acute injuries 149
- Athletic injury management checklist 155
- Transmission of hepatitis B and C viruses and human immunodeficiency virus 160
- HIV risk reduction 161
- Risk categories for sports 161
- Glove removal and use 163
- Suggested practices in wound care 166
- Care of skin wounds 167
- Athletic injury management checklist 167
- Taping supplies 176
- Athletic injury management checklist 184
- Return to running following lower extremity injury functional progression 192
- What are therapeutic modalities used for? 193
- Using ice versus heat? 194
- Full return to activity 194
- Athletic injury management checklist 195
- Progressive reactions of injured athletes based on severity of injury and length of rehabilitation 198
- Nine factors to incorporate into goal setting for the athlete 200
- Things a coach or fitness professional can do to provide social support for an injured athlete 201
- Athletic injury management checklist 204
- Muscles of the foot 223
- Caring for a torn blister 231
- Managing the ingrown toenail 233
- Muscles of the ankle joint 237
- Technique for controlling swelling immediately following injury 243
- Muscles of the knee joint 254
- Muscles of the thigh, hip, and groin 273
- Muscles of the shoulder complex 288
- Muscles of the elbow 300
- Muscles of the forearm 306
- Muscles of the wrist, hand, and fingers 310
- Muscles of the spine 321
- Recommended postures and practices for preventing low back pain 322
- Muscles of the abdomen and thorax 335
- Standardized Assessment of Concussion (SAC) form 350
- Cantu evidence-based grading system for concussion 352

Guidelines for returning to play after repeated or recurrent concussions	352	Banned drugs—common ground	390
Common viral, bacterial, and fungal skin infections found in athletes	367	Estimated number of young people ages 5–17 enrolled in specific categories of youth sports	394
Preventing the spread of MRSA	369	Tanner stages of maturity	395
Basic care of athlete's foot	370	Recommendations for strength-training programs from the american academy of pediatrics	396
Management of the acute asthmatic attack	373	Sports injury prevention tips	400
Using a metered-dose inhaler	374	Sports parents safety checklist	401
Classifying blood pressure	378	Plans, policies, and guidelines for managing injuries in school athletic programs	401
Some infectious viral diseases	379	Sport-specific guidelines for injury prevention	402
Identifying a woman at risk for female athletic triad	380	Athletic injury management checklist	403
Sexually transmitted diseases	382	Board of certification requirements for certification as an athletic trainer	410
Identifying an individual who may be using performance-enhancing drugs	387		
Examples of caffeine-containing products	387		
Examples of deleterious effects of anabolic steroids	388		



# Brief Contents

## PART I

### Organizing and Establishing an Effective Athletic Health Care System 1

- 1 Fitness Professionals, Coaches, and the Sports Medicine Team: Defining Roles 2
- 2 Organizing and Administering an Athletic Health Care Program 16
- 3 Legal Liability and Insurance 32

## PART II

### Preventing Injuries in an Athletic Health Care System 41

- 4 Preventing Injuries Through Fitness Training 42
- 5 Sports Nutrition and Supplements 81
- 6 Selecting and Using Protective Sports Equipment 102
- 7 Understanding the Potential Dangers of Adverse Environmental Conditions 123

## PART III

### Techniques for Treating and Managing Sport-Related Injuries 137

- 8 Handling Emergency Situations and Injury Assessment 138
- 9 Bloodborne Pathogens, Universal Precautions, and Wound Care 158
- 10 Wrapping and Taping Techniques 170
- 11 Understanding the Basics of Injury Rehabilitation 187
- 12 Helping the Injured Athlete Psychologically 197

## PART IV

### Recognition and Management of Specific Injuries and Conditions 207

- 13 Recognizing Different Sports Injuries 208
- 14 The Foot and Toes 221
- 15 The Ankle and Lower Leg 235
- 16 The Knee and Related Structures 252
- 17 The Thigh, Hip, Groin, and Pelvis 270
- 18 The Shoulder Complex 285
- 19 The Elbow, Forearm, Wrist, and Hand 299
- 20 The Spine 317
- 21 The Thorax and Abdomen 334
- 22 The Head, Face, Eyes, Ears, Nose, and Throat 347
- 23 General Medical Conditions and Additional Health Concerns 366
- 24 Substance Abuse 386
- 25 Preventing and Managing Injuries in Young Athletes 393

### Appendixes

- Appendix A Employment Settings for the Athletic Trainer 406
- Appendix B Requirements for Certification as an Athletic Trainer 409
- Appendix C Directional Movements for Body Joints 411

Glossary 419

Credits 423

Index 425

# Contents

Preface viii

Applications at a Glance xiii

## PART I

### Organizing and Establishing an Effective Athletic Health Care System 1

#### Chapter 1 Fitness Professionals, Coaches, and the Sports Medicine Team: Defining Roles 2

What Is Sports Medicine? 3

Athletic Health Care in Organized versus Recreational Sports Activities 3

The Players on the Sports Medicine Team 4

Summary 13

Web Sites 15

#### Chapter 2 Organizing and Administering an Athletic Health Care Program 16

Establishing Rules of Operation for an Athletic Health Care Program 16

Record Keeping 19

Developing a Budget 24

Considerations in Planning an Athletic Health Care Facility 26

Summary 29

#### Chapter 3 Legal Liability and Insurance 32

Legal Concerns 32

Product Liability 35

What Types of Insurance Are Necessary to Protect the Athlete? 36

Insurance Billing 38

Insurance to Protect the Professional 38

Summary 39

Web Sites 40

## PART II

### Preventing Injuries in an Athletic Health Care System 41

#### Chapter 4 Preventing Injuries Through Fitness Training 42

Conditioning Seasons and Periodization 42

Foundations of Conditioning 44

Warm-Up and Cool-Down 44

Why Is It Important to Have Good Flexibility? 45

Why Are Muscular Strength, Endurance, and Power Important for Athletes? 53

What Physiological Changes Occur to Cause Increased Strength? 55

Core Stabilization Training 55

What Are the Techniques of Resistance Training? 57

Open versus Closed-Kinetic Chain Exercises 66

Why Is Cardiorespiratory Fitness Important for an Athlete? 73

What Determines How Efficiently the Body Is Using Oxygen? 74

What Training Techniques Can Improve Cardiorespiratory Endurance? 75

Summary 78

Web Sites 80

#### Chapter 5 Sports Nutrition and Supplements 81

The Nutrients 81

The Production of Energy from Foodstuffs 87

What Is a Nutritious Diet? 88

Dietary Supplements 89

Popular Eating and Drinking Practices 92

Glycogen Supercompensation (Loading) 95

Weight Control and Body Composition 96

Disordered Eating 97

Summary 99

Web Sites 101



## **Chapter 6** Selecting and Using Protective

### **Sports Equipment 102**

Safety Standards for Sports Equipment and Facilities 102

Legal Concerns in Using Protective Equipment 103

Using Off-the-Shelf versus Custom Protective Equipment 104

Head Protection 104

Face Protection 108

Trunk and Thorax Protection 111

Lower Extremity Protective Equipment 114

Elbow, Wrist, and Hand Protection 119

Summary 120

Web Sites 122

## **Chapter 7** Understanding the Potential Dangers of Adverse Environmental Conditions 123

Hyperthermia 123

Hypothermia 130

Overexposure to Sun 131

Safety in Lightning and Thunderstorms 132

Summary 133

Web Sites 135

## **PART III**

## **Techniques for Treating and Managing Sport-Related Injuries 137**

### **Chapter 8** Handling Emergency Situations and Injury Assessment 138

The Emergency Action Plan 138

Principles of On-the-Field Injury Assessment 140

Primary Survey 140

Conducting a Secondary Assessment 146

Off-Field Assessment 148

Immediate Treatment Following Acute Musculoskeletal Injury 148

Emergency Splinting 150

Moving and Transporting the Injured Athlete 151

Summary 155

Web Sites 157

### **Chapter 9** Bloodborne Pathogens, Universal Precautions, and Wound Care 158

What Are Bloodborne Pathogens? 158

Dealing with Bloodborne Pathogens in Athletics 161

Universal Precautions in an Athletic Environment 162

Caring for Skin Wounds 165

Summary 167

Web Sites 169

### **Chapter 10** Wrapping and Taping Techniques 170

Elastic Wraps 171

Nonelastic and Elastic Adhesive Taping 175

Common Taping Techniques 178

Summary 184

Web Sites 186

### **Chapter 11** Understanding the Basics of Injury Rehabilitation 187

Therapeutic Exercise versus Conditioning Exercise 187

Philosophy of Athletic Injury Rehabilitation 187

Basic Components and Goals of a Rehabilitation Program 188

Using Therapeutic Modalities 193

Criteria for Full Recovery 194

Summary 195

Web Sites 196

### **Chapter 12** Helping the Injured Athlete Psychologically 197

The Athlete's Psychological Response to Injury 197

Predictors of Injury 198

Goal Setting as a Motivator to Compliance 200

Providing Social Support to the Injured Athlete 200

Return to Competition Decisions 203

Referring the Athlete for Psychological Help 204

Summary 204

Web Sites 205

## **PART IV**

## **Recognition and Management of Specific Injuries and Conditions 207**

### **Chapter 13** Recognizing Different Sports Injuries 208

Acute (Traumatic) Injuries 208

Chronic Overuse Injuries 215

The Importance of the Healing Process Following Injury 217

Summary 219

Web Sites 220

## **Chapter 14 The Foot and Toes 221**

- Foot Anatomy 221
- Prevention of Foot Injuries 223
- Foot Assessment 224
- Recognition and Management of Foot Injuries 225
- Summary 233

## **Chapter 15 The Ankle and Lower Leg 235**

- Ankle and Lower Leg Anatomy 235
- Prevention of Lower Leg and Ankle Injuries 237
- Assessing the Ankle Joint 239
- Recognition and Management of Injuries to the Ankle 240
- Assessing the Lower Leg 245
- Recognition and Management of Injuries to the Lower Leg 245
- Summary 249
- Web Sites 251

## **Chapter 16 The Knee and Related Structures 252**

- Knee Anatomy 252
- Prevention of Knee Injuries 255
- Assessing the Knee Joint 255
- Recognition and Management of Injuries to the Knee 258
- Recognition and Management of Injuries and Conditions of the Extensor Mechanism 265
- Summary 268

## **Chapter 17 The Thigh, Hip, Groin, and Pelvis 270**

- Anatomy of the Thigh, Hip, Groin, and Pelvic Region 270
- Assessing Thigh, Hip, Groin, and Pelvis Injuries 271
- Prevention of Injuries to the Thigh, Hip, Groin, and Pelvic Region 274
- Recognition and Management of Injuries to the Thigh 274
- Recognition and Management of Hip and Groin Injuries 277
- Recognition and Management of Injuries to the Pelvis 281
- Summary 282
- Web Sites 284

## **Chapter 18 The Shoulder Complex 285**

- Anatomy of the Shoulder 285
- Prevention of Shoulder Injuries 287
- Assessing the Shoulder Complex 289
- Recognition and Management of Shoulder Injuries 291
- Summary 297
- Web Sites 298

## **Chapter 19 The Elbow, Forearm, Wrist, and Hand 299**

- Anatomy of the Elbow Joint 299
- Assessing Elbow Injuries 299
- Prevention of Elbow, Forearm, and Wrist Injuries 301
- Recognition and Management of Injuries to the Elbow 302
- Anatomy of the Forearm 305
- Assessing Forearm Injuries 305
- Recognition and Management of Injuries to the Forearm 306
- Anatomy of the Wrist, Hand, and Fingers 308
- Assessment of the Wrist, Hand, and Fingers 310
- Recognition and Management of Wrist and Hand Injuries 310
- Recognition and Management of Finger Injuries 312
- Summary 315

## **Chapter 20 The Spine 317**

- Anatomy of the Spine 317
- Preventing Injuries to the Spine 321
- Assessment of the Spine 323
- Recognition and Management of Cervical Spine Injuries and Conditions 325
- Recognition and Management of Lumbar Spine Injuries and Conditions 327
- Recognition and Management of Sacroiliac Joint and Coccyx Injuries 330
- Summary 331
- Web Sites 333

## **Chapter 21 The Thorax and Abdomen 334**

- Anatomy of the Thorax 334
- Anatomy of the Abdomen 334
- Preventing Injuries to the Thorax and Abdomen 336
- Assessment of the Thorax and Abdomen 336
- Recognition and Management of Thoracic Injuries 338
- Recognition and Management of Abdominal Injuries 341
- Summary 345
- Web Sites 346

## **Chapter 22 The Head, Face, Eyes, Ears, Nose, and Throat 347**

- Preventing Injuries to the Head, Face, Eyes, Ears, Nose, and Throat 347
- Anatomy of the Head 347
- Assessing Head Injuries 348
- Recognition and Management of Specific Head Injuries 351



Anatomy of the Face	354
Recognition and Management of Specific Facial Injuries	355
Dental Anatomy	356
Preventing Dental Injuries	356
Recognition and Management of Specific Dental Injuries	356
Anatomy of the Nose	358
Recognition and Management of Specific Nasal Injuries	358
Anatomy of the Ear	359
Recognition and Management of Specific Injuries to the Ear	359
Anatomy of the Eye	361
Recognition and Management of Specific Eye Injuries	361
Recognition and Management of Injuries to the Throat	363
Summary	364
Web Sites	365

## Chapter 23 General Medical Conditions and Additional Health Concerns 366

Skin Infections	366
Respiratory Conditions	370
Gastrointestinal Disorders	374
Other Conditions That Can Affect the Athlete	375
Cancer	378
Menstrual Irregularities and the Female Reproductive System	379
Sexually Transmitted Diseases (STDs)	381
Summary	383
Web Sites	385

## Chapter 24 Substance Abuse 386

Performance-Enhancing Drugs	386
Recreational Drug Abuse	390
Drug-Testing Programs	390
Summary	391
Web Sites	392

## Chapter 25 Preventing and Managing Injuries in Young Athletes 393

Cultural Trends	393
Physical Maturity Assessment in Matching Athletes	395
Physical Conditioning and Training	396
Psychological and Learning Concerns	397
Coaching Qualifications	398
Common Injuries in the Young Athlete	398
Sports Injury Prevention	400
Summary	403
Web Sites	405

## Appendixes

Appendix A Employment Settings for the Athletic Trainer	406
Appendix B Requirements for Certification as an Athletic Trainer	409
Appendix C Directional Movements for Body Joints	411
Glossary	419
Credits	423
Index	425

## Organizing and Establishing an Effective Athletic Health Care System

- 1** Fitness Professionals, Coaches, and the Sports Medicine Team: Defining Roles
- 2** Organizing and Administering an Athletic Health Care Program
- 3** Legal Liability and Insurance





# Fitness Professionals, Coaches, and the Sports Medicine Team: Defining Roles

## ■ Objectives

*When you finish this chapter you will be able to:*

- Define the umbrella term *sports medicine*.
- Identify various sports medicine organizations.
- Contrast athletic health care in organized versus recreational sports activities.
- Discuss how fitness professionals, including personal fitness trainers and strength and conditioning coaches, relate to the sports medicine team.
- Describe the role of an individual supervising a recreational program in athletic injury management.
- Analyze the role of the athletic administrator in the athletic health care system.
- Describe the role of the coach in injury prevention, emergency care, and injury management.
- Identify the responsibilities of the athletic trainer in dealing with the injured athlete.
- Describe the role of the team physician and his or her interaction with the athletic trainer.
- Explain how the sports medicine team should interact with the athlete.
- Identify other members of the sports medicine team and describe their roles.

Millions of individuals in our American society participate on a regular basis in both organized and recreational sports or physical activities. There is great demand for well-educated, professionally trained personnel to supervise and oversee these activities. Among those professionals are coaches, fitness professionals such as strength and conditioning specialists and personal fitness trainers, recreation specialists, athletic administrators, and others interested in some aspect of exercise and sports science.

Ironically, participation in any type of physical activity places the “athlete” in situations in which injury is likely to occur. Athletes who engage in organized sports and/or recreational activities have

**An athlete is an individual who engages in and is proficient in sports and/or physical exercise.**

every right to expect that their health and safety will be a high

priority for those who supervise or organize those activities. Thus it is essential to have some knowledge about how injuries can best be prevented or at least minimized. Should injury occur, it is critical to be able to recognize that a problem exists, to learn how to correctly provide first-aid care, and to then refer the athlete to the appropriate medical or health care personnel for optimal treatment. However, it must be emphasized that these well-trained professionals are NOT health care professionals. In fact, attempting to provide health care to an injured or ill athlete is in most states illegal and likely violates the practice acts of several different professional health care provider groups licensed by the state to give medical care to an injured athlete.

**The intent throughout this text is to provide students who intend to become coaches, fitness professionals, recreation specialists, athletic administrators, physical education**