

This International Student Edition is for use outside of the U.S.

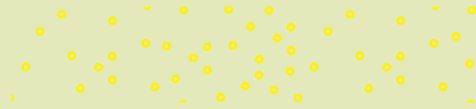
Eleventh Edition

Essentials of Athletic Injury Management



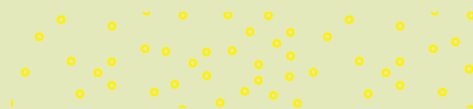
**Mc
Graw
Hill**
Education

William Prentice

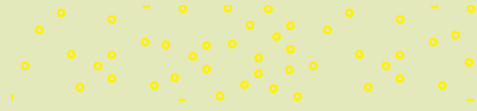


Essentials of

ATHLETIC INJURY MANAGEMENT



This page intentionally left blank



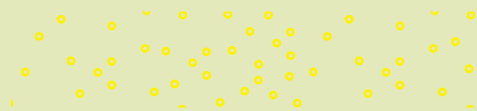
Essentials of

ATHLETIC INJURY MANAGEMENT

ELEVENTH 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

Published by McGraw-Hill Education, 2 Penn Plaza, New York, NY 10121. Copyright ©2020 by McGraw-Hill Education. 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 McGraw-Hill Education, 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 LWI 21 20 19

ISBN 978-1-260-54803-7
MHID 1-260-54803-1

Cover Image: ©William E. Prentice

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

The Internet addresses listed in the text were accurate at the time of publication. The inclusion of a website does not indicate an endorsement by the authors or McGraw-Hill Education, and McGraw-Hill Education does not guarantee the accuracy of the information presented at these sites.

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 43

- 4 Preventing Injuries Through Fitness Training 44
- 5 Sports Nutrition and Supplements 83
- 6 Selecting and Using Protective Sports Equipment 105
- 7 Understanding the Potential Dangers of Adverse Environmental Conditions 127

PART III

Techniques for Treating and Managing Sport-Related Injuries 141

- 8 Handling Emergency Situations and Injury Assessment 142
- 9 Bloodborne Pathogens, Universal Precautions, and Wound Care 163
- 10 Wrapping and Taping Techniques 175
- 11 Understanding the Basics of Injury Rehabilitation 192

- 12 Helping the Injured Athlete Psychologically 202

PART IV

Recognition and Management of Specific Injuries and Conditions 211

- 13 Recognizing Different Sports Injuries 212
- 14 The Foot and Toes 226
- 15 The Ankle and Lower Leg 241
- 16 The Knee and Related Structures 258
- 17 The Thigh, Hip, Groin, and Pelvis 277
- 18 The Shoulder Complex 292
- 19 The Elbow, Forearm, Wrist, and Hand 306
- 20 The Spine 325
- 21 The Thorax and Abdomen 341
- 22 The Head, Face, Eyes, Ears, Nose, and Throat 354
- 23 General Medical Conditions and Additional Health Concerns 374
- 24 Substance Abuse 395
- 25 Preventing and Managing Injuries in Young Athletes 403

Appendixes

- Appendix A: Employment Settings for the Athletic Trainer 417
- Appendix B: Requirements for Certification as an Athletic Trainer 420
- Appendix C: Directional Movements for Body Joints 422

- Glossary 430
- Index 434

Contents

Preface xi

Applications at a Glance xvii

Summary 40

Websites 41

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
Websites 15

Chapter 2 Organizing and Administering an Athletic Health Care Program 16
Establishing Rules of Operation for an Athletic Health Care Program 16
Developing a Risk Management Plan 19
Record Keeping 20
Developing a Budget 26
Considerations in Planning an Athletic Health Care Facility 27
Summary 30

Chapter 3 Legal Liability and Insurance 32
Legal Concerns 32
Product Liability 36
What Types of Insurance Are Necessary to Protect the Athlete? 36
Reimbursement 38
Insurance Billing 39
Insurance to Protect the Professional 39

PART II

Preventing Injuries in an Athletic Health Care System 43

Chapter 4 Preventing Injuries Through Fitness Training 44
Conditioning Seasons and Periodization 44
Foundations of Conditioning 46
Warm-Up and Cool-Down 46
Why Is It Important to Have Good Flexibility? 47
Why Are Muscular Strength, Endurance, and Power Important for Athletes? 55
What Physiological Changes Occur to Cause Increased Strength? 57
Core Stabilization Training 57
What Are the Techniques of Resistance Training? 59
Strength-Training Considerations for Female Athletes 74
Why Is Cardiorespiratory Fitness Important for an Athlete? 75
What Determines How Efficiently the Body Is Using Oxygen? 76
What Training Techniques Can Improve Cardiorespiratory Endurance? 77
Summary 80
Websites 82

Chapter 5 Sports Nutrition and Supplements 83
The Nutrients 83
The Production of Energy from Foodstuffs 89
What Is a Nutritious Diet? 90
Dietary Supplements 91
Popular Eating and Drinking Practices 94

Weight Control and Body Composition 98
Disordered Eating 100
Summary 102
Websites 104

Chapter 6 Selecting and Using Protective Sports Equipment 105

Safety Standards for Sports Equipment and Facilities 105
Legal Concerns in Using Protective Equipment 106
Using Off-the-Shelf Versus Custom Protective Equipment 107
Head Protection 107
Face Protection 111
Trunk and Thorax Protection 114
Lower-Extremity Protective Equipment 118
Elbow, Wrist, and Hand Protection 123
Summary 124
Websites 126

Chapter 7 Understanding the Potential Dangers of Adverse Environmental Conditions 127

Hyperthermia 127
Hypothermia 134
Overexposure to Sun 135
Safety in Lightning and Thunderstorms 136
Summary 137
Websites 139

PART III

Techniques for Treating and Managing Sport-Related Injuries 141

Chapter 8 Handling Emergency Situations and Injury Assessment 142

The Emergency Action Plan 142
Principles of On-the-Field Injury Assessment 145
Primary Survey 145
Conducting a Secondary Assessment 150

Off-Field Assessment 152
Immediate Treatment Following Acute Musculoskeletal Injury 153
Emergency Splinting 154
Moving and Transporting the Injured Athlete 155
Summary 160
Websites 162

Chapter 9 Bloodborne Pathogens, Universal Precautions, and Wound Care 163

What Are Bloodborne Pathogens? 163
Dealing with Bloodborne Pathogens in Athletics 166
Universal Precautions in an Athletic Environment 167
Caring for Skin Wounds 170
Summary 173
Websites 174

Chapter 10 Wrapping and Taping Techniques 175

Elastic Wraps 176
Nonelastic and Elastic Adhesive Taping 180
Common Taping Techniques 183
Kinesio Taping 189
Summary 190
Websites 191

Chapter 11 Understanding the Basics of Injury Rehabilitation 192

Therapeutic Exercise Versus Conditioning Exercise 192
Philosophy of Athletic Injury Rehabilitation 192
Basic Components and Goals of a Rehabilitation Program 193
Using Therapeutic Modalities 198
Criteria for Return to Play 199
Summary 200
Websites 201

Chapter 12 Helping the Injured Athlete Psychologically 202

The Athlete's Psychological Response to Injury 202

Predictors of Injury	203
Goal Setting as a Motivator to Compliance	205
Providing Social Support to the Injured Athlete	205
Return to Competition Decisions	208
Referring the Athlete for Psychological Help	208
Summary	209
Websites	210

PART IV

Recognition and Management of Specific Injuries and Conditions 211

Chapter 13 Recognizing Different Sports Injuries 212

Acute (Traumatic) Injuries	212
Chronic Overuse Injuries	219
The Importance of the Healing Process Following Injury	222
Summary	223
Websites	225

Chapter 14 The Foot and Toes 226

Foot Anatomy	226
Prevention of Foot Injuries	228
Foot Assessment	229
Recognition and Management of Foot Injuries	230
Summary	239
Websites	240

Chapter 15 The Ankle and Lower Leg 241

Ankle and Lower-Leg Anatomy	241
Prevention of Lower-Leg and Ankle Injuries	243
Assessing the Ankle Joint	245
Recognition and Management of Injuries to the Ankle	246
Assessing the Lower Leg	251
Recognition and Management of Injuries to the Lower Leg	251
Summary	255
Websites	257

Chapter 16 The Knee and Related Structures 258

Knee Anatomy	258
Prevention of Knee Injuries	261
Assessing the Knee Joint	262
Recognition and Management of Injuries to the Knee	265
Recognition and Management of Injuries and Conditions Classified as Patellofemoral Pain Syndrome	272
Summary	275
Websites	276

Chapter 17 The Thigh, Hip, Groin, and Pelvis 277

Anatomy of the Thigh, Hip, Groin, and Pelvic Region	277
Assessing Thigh, Hip, Groin, and Pelvis Injuries	278
Prevention of Injuries to the Thigh, Hip, Groin, and Pelvic Region	281
Recognition and Management of Injuries to the Thigh	281
Recognition and Management of Hip and Groin Injuries	284
Recognition and Management of Injuries to the Pelvis	288
Summary	290
Websites	291

Chapter 18 The Shoulder Complex 292

Anatomy of the Shoulder	292
Prevention of Shoulder Injuries	294
Assessing the Shoulder Complex	296
Recognition and Management of Shoulder Injuries	298
Summary	304
Websites	305

Chapter 19 The Elbow, Forearm, Wrist, and Hand 306

Anatomy of the Elbow Joint	306
Assessing Elbow Injuries	306
Prevention of Elbow, Forearm, and Wrist Injuries	308
Recognition and Management of Injuries to the Elbow	309

Anatomy of the Forearm 312
Assessing Forearm Injuries 313
Recognition and Management of Injuries to the Forearm 314
Anatomy of the Wrist, Hand, and Fingers 315
Assessment of the Wrist, Hand, and Fingers 316
Recognition and Management of Wrist and Hand Injuries 316
Recognition and Management of Finger Injuries 320
Summary 323
Websites 324

Chapter 20 The Spine 325

Anatomy of the Spine 325
Preventing Injuries to the Spine 329
Assessment of the Spine 331
Recognition and Management of Cervical Spine Injuries and Conditions 333
Recognition and Management of Lumbar Spine Injuries and Conditions 335
Recognition and Management of Sacroiliac Joint and Coccyx Injuries 338
Summary 339
Websites 340

Chapter 21 The Thorax and Abdomen 341

Anatomy of the Thorax 341
Anatomy of the Abdomen 342
Preventing Injuries to the Thorax and Abdomen 343
Assessment of the Thorax and Abdomen 343
Recognition and Management of Thoracic Injuries 345
Recognition and Management of Abdominal Injuries 348
Summary 352
Websites 353

Chapter 22 The Head, Face, Eyes, Ears, Nose, and Throat 354

Preventing Injuries to the Head, Face, Eyes, Ears, Nose, and Throat 354
Anatomy of the Head 354
Assessing Head Injuries 355
Recognition and Management of Specific Head Injuries 357

Anatomy of the Face 362
Recognition and Management of Specific Facial Injuries 362
Dental Anatomy 363
Preventing Dental Injuries 363
Recognition and Management of Specific Dental Injuries 364
Anatomy of the Nose 365
Recognition and Management of Specific Nasal Injuries 365
Anatomy of the Ear 366
Recognition and Management of Specific Injuries to the Ear 366
Anatomy of the Eye 368
Recognition and Management of Specific Eye Injuries 369
Recognition and Management of Injuries to the Throat 371
Summary 371
Websites 373

Chapter 23 General Medical Conditions and Additional Health Concerns 374

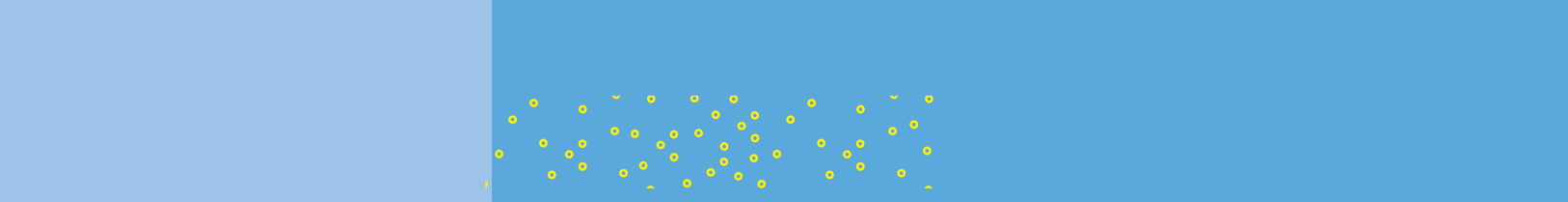
Skin Infections 374
Respiratory Conditions 378
Gastrointestinal Disorders 382
Other Conditions that can Affect the Athlete 383
Cancer 387
Menstrual Irregularities and the Female Reproductive System 388
Sexually Transmitted Diseases (STDs) 390
Summary 392
Websites 394

Chapter 24 Substance Abuse 395

Performance-Enhancing Drugs 395
Recreational Drug Abuse 399
Drug-Testing Programs 400
Summary 401
Websites 402

Chapter 25 Preventing and Managing Injuries in Young Athletes 403

Cultural Trends 403
Physical Maturity Assessment in Matching Athletes 405



Physical Conditioning and Training 406
Psychological and Learning Concerns 407
Coaching Qualifications 408
Common Injuries in the Young Athlete 409
Sports Injury Prevention 410
Summary 413
Websites 416

Appendix B Requirements for Certification as an
Athletic Trainer 420

Appendix C Directional Movements for Body
Joints 422

Glossary 430

Index 434

Appendixes

Appendix A Employment Settings for the Athletic
Trainer 417

WHO SHOULD USE THIS TEXT?

The eleventh edition of *Essentials of Athletic Injury Management* is written for those students interested in the fitness profession, kinesiology, coaching, or some aspect of sport science or physical education. 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.

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 sixteenth 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 eleventh edition of *Essentials of Athletic Injury Management* provides the reader with the most current information 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 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 Injuries*, 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 potentially 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, forearm, wrist, 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

Chapter Changes and Additions

Numerous changes and clarifications have been made in content throughout the entire text.

Chapter 1

- Reorganized and updated the roles and responsibilities of athletic trainers according to the latest BOC Practice Analysis.
- Added the role of the physiatrist in caring for the injured athlete.
- Significantly updated the recommended references and the annotated bibliography to make them as current as possible.

Chapter 2

- Added new information on developing a risk management plan.
- Added revised athletic injury record form.
- Significantly updated the recommended references and the annotated bibliography to make them as current as possible.

Chapter 3

- Reorganized and clarified the information on legal liabilities.
- Updated information on insurance.
- Added a new sample insurance information form.
- Updated the recommended references to make them as current as possible.

Chapter 4

- Updated information on and recommendations for the warm-up and cool-down.
- Calisthenic exercises are now referred to more correctly as bodyweight exercises.
- Updated information on calculating a target heart rate for improving cardiorespiratory endurance.
- Significantly updated the recommended references and the annotated bibliography to make them as current as possible.

Chapter 5

- Updated recommendations for percent of calorie intake of carbohydrates, fat, and protein.
- Updated most current information on MyPlate.
- Added new information on food labels.
- Added green tea to most widely used herbs list.

- Added new information on gluten-free diets.
- Updated information on eating organic, natural, and health foods.
- Updated information on glycogen supercompensation.
- Significantly updated the recommended references and the websites to make them as current as possible.

Chapter 6

- Updated list of equipment regulatory agencies.
- Updated information regarding the use of mouth guards.
- Added most recent information about cleated shoes.
- Significantly updated the recommended references to make them as current as possible.

Chapter 7

- Updated information on exercise-associated muscle (heat) cramps.
- Updated Table 7–2 comparing heat disorders.
- Updated the management techniques for treating heat stroke.
- Updated information on lightning safety.
- Added chilblain as a cold disorder.
- Exertional hyponatremia is no longer classified as a heat illness.
- Significantly updated the recommended references to make them as current as possible.

Chapter 8

- Added new recommendation that a “time out” should be used to make certain that all involved with health care are prepared to handle an emergency.
- Updated information on care and management of the unconscious athlete.
- Reordered the life-threatening injuries in the emergency procedures flowchart.
- Made slight adjustments in the CPR Summary table to clarify the procedures.
- Changed the acronym PRICE to POLICE, emphasizing the importance of optimal loading in immediate injury management.

- Updated information on the efficacy of using ice and compression in immediate injury care.
- Updated information on managing care for an athlete with suspected cervical spine injury.
- Updated information on placing the athlete on a spine board.
- Added the most current recommendations from an inter-association task force to consider removing the helmet and shoulder pads by trained personnel prior to transporting an athlete with a suspected cervical spine injury.
- Updated information on the techniques for transporting an athlete with a suspected cervical spine injury from the field to the hospital.
- Significantly updated the recommended references and annotated bibliography to make them as current as possible.

Chapter 9

- Updated statistics on numbers of patients infected by various bloodborne pathogens
- Replaced photos showing various skin wounds.
- Updated Focus Box 9–4 on suggested practices in caring for skin wounds.
- Update Table 9–2 on wound care.
- Significantly updated the recommended references and annotated bibliography to make them as current as possible.

Chapter 10

- Added a new photo of a kinesio taping technique.

Chapter 11

- Reemphasized the discussion that clarifies the purpose of this chapter and gives a caution about who is legally able to suggest or supervise a program of rehabilitation for an injured athlete.

Chapter 12

- Updated information on psychological disorders.

Chapter 13

- Updated information on tendinopathy, tendinitis, and tendinosis.

- Updated information on the cause of muscle cramps.
- Significantly updated the recommended references to make them as current as possible.

Chapter 14

- Significantly updated the recommended references and annotated bibliography to make them as current as possible.

Chapter 15

- Clarified the difference between Achilles tendinitis and Achilles tendinosis.
- Significantly updated the recommended references and annotated bibliography to make them as current as possible.

Chapter 16

- Added new information that clarifies the mechanisms of injury for both noncontact and contact ACL injuries.
- Significantly updated the recommended references and annotated bibliography to make them as current as possible.

Chapter 17

- Added new X-ray photos for Legg-Calve-Perthes disease.
- Significantly updated the recommended references and annotated bibliography to make them as current as possible.

Chapter 18

- Significantly updated the recommended references and websites to make them as current as possible.

Chapter 19

- Added a new photo for a subungual hematoma in the finger.
- Significantly updated the recommended references and annotated bibliography to make them as current as possible.

Chapter 20

- Significantly updated the recommended references and annotated bibliography to make them as current as possible.

Chapter 21

- Significantly updated the recommended references and annotated bibliography to make them as current as possible.

Chapter 22

- Updated information on nasal fractures.
- Updated information on nasal and septal hematomas.
- Updated new photo on tooth fractures.
- Updated and added new information about evaluating concussions that currently uses the SCAT5 as the most accepted evaluation tool.
- Updated causes of tympanic membrane rupture.
- Significantly updated the recommended references and annotated bibliography to make them as current as possible.

Chapter 23

- Updated information on requirements for certification.
- Added new information of treating a sore throat.
- Updated information on signs of indigestion.
- Updated information on diabetes.
- Updated information on exercise during pregnancy.
- Significantly updated the recommended references and annotated bibliography to make them as current as possible.

Chapter 24

- Added new information on heroin use.
- Significantly updated the recommended references, annotated bibliography, and websites to make them as current as possible.

Chapter 25

- Updated Youth Sports Safety Alliance statistics on injuries in youth sports.
- Updated information on early specialization in a single sport and the long-term outcomes of that choice.
- Significantly updated the recommended references, annotated bibliography, and websites to make them as current as possible.

Appendix A

- Updated the information on employment of certified athletic trainers in secondary schools.
- Updated information on requirements for certification.

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 in full color, with over 40 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.* These checklists 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.
- *Recommended 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.

- *Websites.* A list of useful websites is included to direct the student to additional relevant information that can be found on the Internet.
- *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

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 on Connect.

PowerPoint Presentation

A comprehensive 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 website at www.mhhe.com/prentice11e. Adopters of the text can obtain the login and password to access this presentation by contacting their local McGraw-Hill sales representative.

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 eleventh edition of *Essentials*

of *Athletic Injury Management* and I cannot thank him enough for everything he does for me. I would also like to thank Alex Preiss who has been my Editor at McGraw-Hill.

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

Steven M. Zinder

University of South Florida

John Lowry

Saginaw Valley State University

Shari Bartz-Smith

Grand Valley State University

David C. Berry

Saginaw Valley State University

Michael W. Goforth

Virginia Tech

Tom Lechtenberg

Northeastern State University

James Michael Lynch

Florida Southern College

Rachel Lindsey

University of Hawaii, Manoa

Jim Racchini

Indiana University of Pennsylvania

Jennifer O'Donoghue

North Carolina State University

Lee Ann Price

Eastern Illinois University

William Zachary Garrett

Marshall University

Finally, I would like to thank my two sons Brian and Zach for always being an important part of everything that I do, and my wife Tena, who over the last two years has demonstrated to all of us the tenuous frailty of the human body and the inspirational resilience of the human spirit.

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? 18
- Secondary School Student Athletes' Bill of Rights 18
- Rules and policies of the athletic health care facility 19
- Suggestions for maintaining a sanitary environment 19
- Cleaning responsibilities 20
- Recommended health practices checklist 20
- Orthopedic Screening Examination 24
- Recommended basic health care facility supplies 27
- Recommended basic field kit supplies 28
- Athletic injury management checklist 30
- Athletic injury management checklist 35
- Key features and benefits of the Affordable Care Act 37
- Athletic injury management checklist 39
- Periodization training 45
- Principles of conditioning 46
- Guidelines and precautions for stretching 50
- Techniques for improving muscular strength 60
- Progressive resistance exercise terminology 62
- Comparison of aerobic versus anaerobic activities 75
- Rating of perceived exertion 79
- Athletic injury management checklist 80
- Vitamins 86
- Minerals 88
- Most widely used herbs and purposes for use 94
- Tips for selecting fast foods 98
- Guidelines for weight loss 100
- Recognizing the individual with disordered eating 101
- Athletic injury management checklist 102
- Equipment regulatory agencies 106
- Guidelines for purchasing and reconditioning helmets 107
- Proper football helmet fit 109
- Rules for fitting football shoulder pads 115
- Shoe comparisons 119
- Athletic injury management checklist 124
- Universal WBGT index fluid replacement recommendations 129
- Summary and comparison of heat disorders, treatment, and prevention 130
- Recommendations for fluid replacement 133
- Recommendations for preventing heat illness 133
- Athletic injury management checklist 137
- Sample emergency action plan 144
- Consent form for medical treatment of a minor 145
- CPR summary 147
- Vital signs 150
- Initial management of acute injuries 153
- Athletic injury management checklist 160
- Transmission of hepatitis B and C viruses and human immunodeficiency virus 165
- HIV risk reduction 166
- Bloodborne pathogen risk categories for sports 166
- Glove removal and use 168
- Suggested practices in wound care 171
- Care of skin wounds 172
- Athletic injury management checklist 173
- Taping supplies 181
- Athletic injury management checklist 189
- Return to running following lower-extremity injury functional progression 197
- What are therapeutic modalities used for? 198
- Using ice versus heat? 199
- Full return to play 199
- Athletic injury management checklist 200
- Progressive reactions of injured athletes based on severity of injury and length of rehabilitation 203
- Nine factors to incorporate into goal setting for the athlete 205
- Things a coach or fitness professional can do to provide social support for an injured athlete 206
- Athletic injury management checklist 209
- Muscles of the foot 228
- Caring for a torn blister 237
- Managing the ingrown toenail 238
- Muscles of the ankle joint 243
- Technique for controlling swelling immediately following injury 249
- Muscles of the knee joint 260
- Muscles of the thigh, hip, and groin 280
- Muscles of the shoulder complex 295
- Muscles of the elbow 307
- Muscles of the forearm 313

Muscles of the wrist, hand, and fingers 318
Muscles of the spine 329
Recommended postures and practices for preventing low back pain 330
Muscles of the abdomen and thorax 342
When an athlete shows *any* signs of a concussion 358
The Graded Symptoms Checklist 359
Common viral, bacterial, and fungal skin infections found in athletes 375
Preventing the spread of MRSA 377
Basic care of athlete's foot 378
Symptoms and management of the acute asthmatic attack 381
Using a metered-dose inhaler 382
Classifying blood pressure 386
Some infectious viral diseases 387
Identifying a woman at risk for female athletic triad 389

Sexually transmitted diseases 391
Identifying an individual who may be using performance-enhancing drugs 396
Examples of caffeine-containing products 396
Examples of deleterious effects of anabolic steroids 397
Banned drugs—common ground 400
Estimated number of young people ages 6–17 enrolled in specific categories of youth sports 404
Tanner stages of maturity 406
Guidelines for Youth Strength Training 407
Sports safety tips 411
Sports parents safety checklist 412
National Action Plan for Sports Safety 413
Athletic injury management checklist 413
Board of certification requirements for certification as an athletic trainer 421

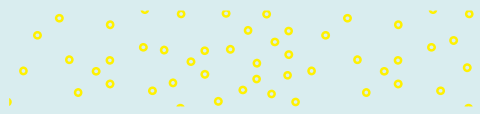
Organizing and Establishing an Effective Athletic Health Care System

- 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

1



©William E. Prentice



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

■ Objectives

When you finish this chapter you will be able to:

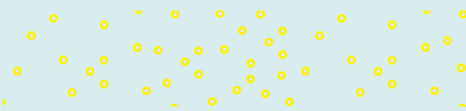
- Define the umbrella term sports medicine.
- Identify various sports medicine organizations.
- Contrast athletic health care in organized versus recreational sports activities.
- Discuss how fitness professionals, including personal fitness trainers and strength and conditioning coaches, relate to the 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

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

organized sports and/or recreational activities have 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 illegal in most states 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 teachers, exercise physiologists, biomechanists, sport psychologists, or sports nutritionists with an introduction or exposure to a variety of topics that relate to athletic injury management. This chapter introduces the members of the sports medicine team with whom these professionals are likely to interact throughout their careers. Specific roles and responsibilities of each member of the sports medicine team in managing the health care of the athlete are discussed in detail.

WHAT IS SPORTS MEDICINE?

The term *sports medicine* refers generically to a broad field of health care related to physical activity and sport. The American College of Sports Medicine (ACSM) has used the term sports medicine to describe a multidisciplinary approach to health management or achievement of full potential, including the physiological, biomechanical, psychological, and pathological phenomena associated with exercise and sports. The clinical application of the work of these disciplines is performed to improve and maintain an individual's functional capacities for physical labor, exercise, and sports. It also includes the prevention and treatment of diseases and injuries related to exercise and sports. The field of sports medicine encompasses under its umbrella a number of more specialized aspects of dealing with the physically active or athletic populations that may be classified as relating either to performance enhancement or to injury care and management (Figure 1–1). Those areas of specialization that are primarily concerned with performance enhancement include exercise physiology, biomechanics, sport psychology, sports nutrition, strength and conditioning, personal fitness training, coaching, and physical education. Areas of specialization that focus more on health care and injury/illness management specific to the athlete are the practice of medicine (physicians and physician assistants), athletic training, sports physical therapy, massage therapy, dentistry, osteopathic medicine, orthotists/prosthetists, sports chiropractic, sports podiatry, and emergency medical specialists. Certainly, some of the specializations listed under this umbrella could be concerned with both performance enhancement and injury care and management (e.g., sports nutrition).

Sports Medicine Organizations

A number of professional organizations are dedicated to the field of sports medicine and dictate the

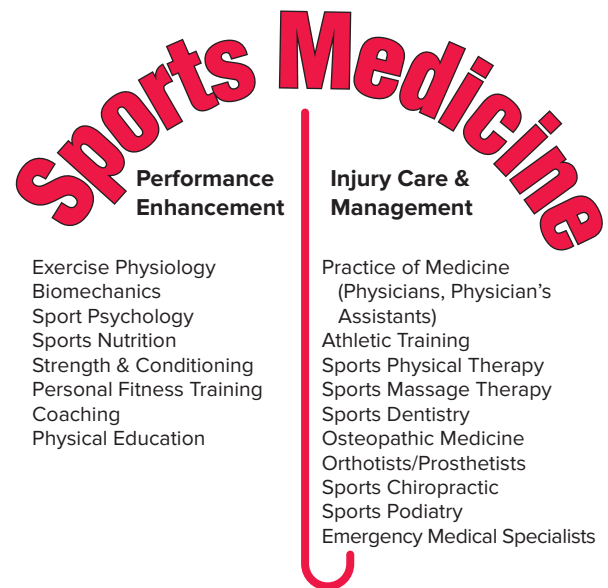


FIGURE 1–1 Areas of specialization under the sports medicine “umbrella.”

roles that members of their organizations play in providing health care to an injured patient. Professional organizations have many goals: (1) to upgrade the field by devising and

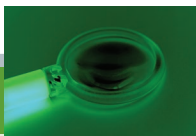
Many professional organizations are dedicated to achieving health and safety in sports.

maintaining a set of professional standards, including a code of ethics; (2) to bring together professionally competent individuals to exchange ideas, stimulate research, and promote critical thinking; and (3) to give individuals an opportunity to work as a group with a singleness of purpose, thereby making it possible for them to achieve objectives that, separately, they could not accomplish. Addresses and websites for these organizations are listed in *Focus Box 1–1*.

Many of the national organizations interested in athletic health and safety have state and local associations that are extensions of the larger bodies. National, state, and local sports organizations have all provided extensive support to the reduction of illness and injury risk to the athlete.

ATHLETIC HEALTH CARE IN ORGANIZED VERSUS RECREATIONAL SPORTS ACTIVITIES

The system or methods by which athletic health care is delivered by members of the sports medicine team largely depend on whether the activity is organized or recreational. An organized activity



FOCUS BOX 1-1

List of professional sports medicine organizations

- American Academy of Pediatrics, Council on Sports Medicine and Fitness, 345 Park Boulevard, Itasca, IL 60143 www.aap.org
- American Board of Physical Therapy Specialists, American Physical Therapy Association, 1111 North Fairfax St., Alexandria, VA 22314 www.abpts.org/Certification/Sports/
- American College of Sports Medicine, 401 W. Michigan St., Indianapolis, IN 46202-3233 www.acsm.org
- American Orthopaedic Society for Sports Medicine, 9400 W. Higgins Rd, Suite 300, Rosemont, Illinois 60018 www.sportsmed.org
- National Athletic Trainers' Association, 1620 Valwood Parkway, Suite 115, Carrollton TX 75006 www.nata.org
- National Collegiate Athletic Association, Competitive Safeguards and Medical Aspects of Sports Committee, 700 W. Washington St., P.O. Box 622, Indianapolis, IN 46206-6222 www.ncaa.org
- National Federation of State High School Athletic Associations, P.O. Box 690, Indianapolis, IN 46206 www.nfhs.org
- National Strength and Conditioning Association, 1885 Bob Johnson Dr., Colorado Springs, CO 80906 www.nasca.com
- American Osteopathic Academy of Sports Medicine, 2424 American Lane, Madison, WI 53704 www.aoasm.org

refers to a situation that is generally competitive in which there is some type of team or league involvement, as would be the case with secondary school, collegiate, and professional athletic teams. With organized sports activities, the primary players on the sports medicine team are employed on either a full-time or part-time basis by a school or organization and include the coach, the athletic trainer, and a physician who is designated as a “team” physician. At the collegiate and professional levels, a strength and conditioning coach, a sports nutritionist, a sports massage therapist, and a sport psychologist are also usually involved. In organized sports activities, the athletic health care system is generally well organized and comprehensive, and in many instances the sports medicine coverage would be considered highly sophisticated.

Certainly a recreational sports activity can be competitive. However, a recreational activity is one that is done more for leisure and free time enjoyment and involves a much less formal structure, with many of the organizers being primarily volunteers. These include city- or community-based recreational leagues and teams. Many individuals choose to engage in fitness-oriented exercise activities such as running or weight training as a recreational activity. These “recreational athletes” may decide to hire personal fitness trainers to help them with their fitness programs. Should injury occur, they are likely to consult their family physician, an athletic trainer, a sports chiropractor, or a sports physical therapist. Athletic health care for

recreational athletes is generally provided on a fee-for-care basis.

THE PLAYERS ON THE SPORTS MEDICINE TEAM

Providing health care to the athlete requires a group effort to be most effective.³⁸ The sports medicine team involves a number of individuals, each of whom must perform specific functions relative to caring for the injured athlete.^{5,12}

How Does the Fitness Professional Relate to the Sports Medicine Team?

Earlier in this chapter, the term *fitness professional* was used to refer collectively to strength and conditioning coaches, personal fitness trainers, and others interested in exercise and sport sciences. In this group we may also include physical education teachers, exercise physiologists, biomechanists, sport psychologists, and sports nutritionists. If we consider the “sports medicine umbrella” model, the focus of this group is generally on improving performance. Certainly an argument can be made that if athletes achieve a high level of fitness through training and conditioning, they are not only more likely to perform athletically at a higher level but they are also less likely to sustain some type of activity-related injury. Therefore, there is a relationship between those areas that specialize in performance enhancement and those that focus on health care in that both groups are concerned with injury prevention.

Strength and Conditioning Coaches The responsibility for making certain that an athlete is fit for competition depends on the personnel available to oversee this aspect of an athletic program. At the professional level and at most colleges and universities, a full-time strength and conditioning coach is employed to conduct both team and individual training sessions.¹³ Many, but not all, strength coaches are certified by the National Strength and Conditioning Association (NSCA).²⁴ This association has more than 30,000 members. It is the responsibility of the strength and conditioning coach to communicate freely and work in close cooperation with both the athletic trainers and the team coaches to ensure that the athletes achieve an optimal level of fitness.⁹ **All strength and conditioning coaches should be certified in CPR/AED (cardiopulmonary resuscitation/automated external defibrillator) by the American Red Cross, the American Heart Association, or the National Safety Council. They should also be certified in first aid by the American Red Cross or the National Safety Council.**

If an athlete is injured and is undergoing a rehabilitation program, it should be the strength and conditioning coach's responsibility to communicate with the athletic trainer, who should dictate how the conditioning program should be limited and/or modified.²² The athletic trainer must respect the role of the strength and conditioning coach in getting the athlete fit. However, the responsibility for rehabilitating an injured athlete clearly belongs to the athletic trainer. The athletic trainer should be allowed to critically review the training and conditioning program designed by the strength and conditioning coach and to be very familiar with what is expected of the athletes on a daily basis. **The athletic trainer should dictate what an injured athlete can or cannot do when engaging in a strength and conditioning program.**⁴¹

In the majority of secondary school settings, a strength and conditioning coach is not available. In this situation either the athletic trainer or team coach often assumes the role of a strength and conditioning coach in addition to his or her athletic training or coaching responsibilities. The athletic trainer or coach frequently finds it necessary not only to design training and conditioning programs but also to oversee the weight room and to educate young, inexperienced athletes about getting themselves fit to compete. The athletic trainer must cooperate with team coaches in supervising the training and conditioning program.

Personal Fitness Trainers A personal fitness trainer is responsible for designing comprehensive exercise

or fitness programs for an individual client based on that person's health history, capabilities, and objectives for

fitness.¹⁸ Once thought of as a service for the rich and famous, people from all income levels are using personal fitness trainers to increase their fitness levels and to get advice about living a healthy lifestyle.

There are more than 300,000 personal fitness trainers in North America, who offer their services to a variety of people and businesses. Although associations and certification agencies can count the number of personal fitness trainers in their organization, many personal fitness trainers have one or more certifications and belong to more than one professional organization, making it almost impossible to accurately assess the number of certified personal fitness trainers in the United States.

Unfortunately, no single standard qualification is required before a person can practice as a personal fitness trainer.⁷ Washington, D.C., is the only jurisdiction in the United States where personal fitness trainers must be registered. About 400 organizations in the United States offer certification to personal fitness trainers. Of that number, only a few are considered legitimate by most professionals. Among the most respected are the American College of Sports Medicine (ACSM), the National Academy of Sports Medicine (NASM), the National Strength and Conditioning Association (NSCA), and the American Council on Exercise (ACE).²¹ These organizations have specific requirements based on tested and practical knowledge, mandatory retesting at renewal periods, and continuing education. A recent trend by some of these organizations is to require that their certified personal fitness trainers have a formal educational degree in exercise science or a related field.²³ However, the requirements for other organizations are not so strict. Some award certification after a person takes a correspondence course over the Internet or attends as little as a weekend or single-day training session. Individuals who hire personal fitness trainers should check qualifications and certifications. **All personal fitness trainers should be certified in CPR/AED by the American Red Cross, the American Heart Association, or the National Safety Council. They should also be certified in first aid by the American Red Cross or the National Safety Council.**

Personal fitness training is without question the strongest growth segment of the fitness industry, and

Fitness professionals include:

- strength and conditioning coaches
- personal fitness trainers
- coaches
- others associated with exercise and sport sciences

this trend is expected to continue as personal fitness trainers are beginning to offer a variety of services that go beyond a general exercise program.¹⁸ Personal fitness trainers are increasingly providing services in postrehabilitation training, sports conditioning, special medical needs, and weight management to a variety of specific client populations including prenatal women, adolescents, and older persons.

How Does a Recreation Specialist Relate to the Sports Medicine Team?

Recreation specialists organize, plan, and oversee leisure activities and athletic programs in local recreation, camp, and park areas; playgrounds; health clubs and fitness centers; the workplace; and theme parks and tourist attractions. An essential responsibility for any individual overseeing a recreational program is to ensure that the recreational environment is as safe as possible to minimize the risk of injury. Should injury occur to a participant, the recreation specialist should be able to provide immediate and correct first aid and then refer the injured person to appropriate medical personnel. **All recreation specialists should be certified in CPR/AED by the American Red Cross, the American Heart Association, or the National Safety Council. They should also be certified in first aid by the American Red Cross or the National Safety Council.**

Recreation and parks directors serve as advisors to local and state recreation and park commissions and manage comprehensive recreation programs in a variety of settings. They are responsible for developing budgets for recreation programs. *Recreation supervisors* serve as liaisons between the director of the park or recreation center and the recreation leaders. They plan, organize, and manage recreational activities to meet the needs of a variety of populations and oversee recreation leaders. Recreation supervisors with more specialized training may also direct special activities or events or oversee a major activity such as aquatics, gymnastics, or performing arts. *Recreation leaders* are primarily responsible for the daily operation of a recreation program. They organize and direct participants; schedule use of facilities; lead and give instruction in dance, drama, crafts, games, and sports; maintain equipment; and ensure appropriate use of recreation facilities. *Activity specialists* provide instruction and coach groups in specialties such as swimming or tennis. *Camp counselors* lead and instruct campers in outdoor-oriented forms of recreation, such as swimming, hiking, horseback riding, and camping.

A *recreational therapist* may be considered a health care provider. Recreational therapists work in acute health care settings, such as hospitals and

rehabilitation centers, or in long-term and residential care facilities. Their job is to treat and rehabilitate individuals with specific health conditions, usually in conjunction or collaboration with physicians, nurses, psychologists, social workers, and physical and occupational therapists. Recreational therapists use leisure activities—especially structured group programs—to improve and maintain their clients' general health and well-being. They also provide interventions that help prevent the client from suffering further medical problems and complications related to illnesses and disabilities.

The Role of the Athletic Administrator in the Sports Medicine Team

Without question, an athletic administrator, overseeing both collegiate and secondary school athletic programs, has a significant role with the sports medicine team. The athletic administrator should have input in hiring personnel who will make up the sports medicine team, including the coaches, the strength and conditioning coach, the athletic trainer, the team physician, a sports nutritionist, and a sport psychologist. It is essential for the athletic administrator to make certain that each individual hired has the appropriate credentials and that he or she is willing and able to work in close cooperation with the other members of the sports medicine team. The athletic administrator should make certain that policies and procedures, a risk management plan, and emergency action plans are developed for the athletic health care system. The administrator is also responsible for establishing a budget for funding all aspects of an athletic health care program, including salaries, supplies, and equipment, and purchasing necessary insurance (see Chapter 2). The consistent support and commitment to an athletic health care program on the part of an athletic administrator can have a tremendous impact on the success of the athletic program.

The Role of a Coach in the Sports Medicine Team

It is critical for the coach to understand the specific roles and responsibilities of each individual who could potentially be involved in the sports medicine team. This becomes even more critical if there is no athletic trainer to oversee the health care and the coach is forced to assume this responsibility. It must be stressed that individual states differ significantly in the laws that govern what nonmedical personnel can and cannot do when providing health care. **Coaches have the responsibility to clearly understand the limits of their ability to function as a health care provider in the state where they are employed.**

All head and assistant coaches should be certified in CPR/AED and first aid.

The coach is directly responsible for preventing injuries by seeing that athletes have undergone a preventive injury conditioning program. The coach must ensure that sports equipment, especially protective equipment, is of the highest quality and is properly fitted. The coach must also make sure that protective equipment is properly maintained.³⁸ A coach must be keenly aware of what produces injuries in his or her particular sport and what measures must be taken to avoid them (Figure 1–2). A coach should be able, when called on to do so, to apply proper first aid. This knowledge is especially important in serious head and spinal injuries. **All coaches (both head and assistant) should be certified in CPR/AED by the American Red Cross, the American Heart Association, or the National Safety Council. Coaches should also be certified in first aid by the American Red Cross or the National Safety Council.**³⁰ For the coach, obtaining these certifications is important in being able to provide correct and appropriate first aid and emergency care for the injured athlete. But it is also true that not having these certifications can potentially have some negative legal implications for the coach and his or her employer.

It is essential that a coach thoroughly understand the skill techniques and environmental factors that may adversely affect the athlete. Poor biomechanics in skill areas such as throwing and running can lead to overuse injuries of the arms and legs, whereas overexposure to heat and humidity may cause death. Just because a coach is



FIGURE 1–2 The coach is directly responsible for preventing injuries in his or her sport. ©William E. Prentice

experienced in coaching does not mean that he or she knows proper skill techniques. Coaches must engage in a continual process of education to further their knowledge in their particular sport through organizations such as the American Sport Education Program (ASEP) or the National Council for Accreditation of Coaching Education (NCACE). When a sports program or specific sport is without an athletic trainer, the coach very often takes over this role.

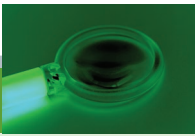
Coaches work closely with athletic trainers; therefore both must develop an awareness of and an insight into each other's roles and responsibilities so that they can function effectively. The athletic trainer must earn the respect of the coaches so that his or her judgment in all medical matters is fully accepted.¹⁴ In turn, the athletic trainer must avoid questioning the abilities of the coaches in their particular fields and must restrict opinions to athletic training matters. To avoid frustration and hard feelings, the coach must coach, and the athletic trainer must conduct athletic training matters. In terms of the health and well-being of the athlete, the physician and the athletic trainer have the last word. The decisions made by the athletic trainer on matters related to health care should always be supported by the athletic administrators.

The Roles and Responsibilities of the Athletic Trainer

It is essential for a coach or other fitness professional who is working with an athletic trainer to gain an appreciation of the roles and responsibilities that an athletic trainer assumes in caring for the athletes (Figure 1–3).⁶ If the coach does not have an athletic trainer, many of those responsibilities may fall on the coach.



FIGURE 1–3 Coaches should work closely with athletic trainers and physicians to provide health care for the injured athlete. ©William E. Prentice



FOCUS BOX 1-2

Clarifying roles

The terms *training* and *athletic training* are often confused. Historically, training implies the act of coaching or teaching. In comparison, athletic training has traditionally been known as a field within the allied health care professions that is concerned with prevention, management, evaluation, and rehabilitation of injuries related to physical activity.⁴²

Recently, there has been confusion in the general public among the terms *trainers*, *certified athletic trainers*, *personal fitness trainers*, and *strength and conditioning coaches*. A *trainer* refers to someone who trains dogs or horses. A *certified athletic trainer* (certified by the Board of Certification) is a highly educated allied health care professional who is a credentialed specialist in athletic training. These individuals hold the credential ATC. Certified athletic

trainers play a major role in the health care of physically active individuals in general and the athlete in particular.³³ Athletic trainers are licensed as health care providers by state licensing boards in 49 of the 50 states (except California) and the District of Columbia. *Personal fitness trainers* may also have some level of certification from any one of at least 400 existing certifying organizations. They are primarily concerned with developing fitness and wellness and improving levels of physical conditioning in a healthy population. Strength and conditioning coaches (certified by the National Strength and Conditioning Association) work primarily with athletes at the professional or collegiate levels to enhance their levels of physical conditioning and optimize performance.

Of all the professionals charged with injury prevention and health care provision for the athlete, perhaps none is more intimately involved with the athlete than the athletic trainer.³⁸ The athletic trainer is the one individual who deals with the athlete from the time of the

Employment settings for athletic trainers:

- Schools
- School systems
- Colleges and universities
- Professional teams
- Clinics/hospitals
- Corporations
- NASCAR, NASA, military, etc.
- Performing arts

initial injury, throughout the period of rehabilitation, until the athlete's complete, unrestricted return to practice or competition.³⁸ 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 of the athlete to activity.^{4,40,44} Athletic trainers are employed by schools and school systems, colleges and universities, professional athletic teams, sports medicine clinics, corporations in industry, and less "traditional" organizations such as the performing arts, NASCAR, NASA, the military, and medical equipment sales/support (see Appendix A).^{19,29}

The athletic trainer must be knowledgeable and competent in a variety of sports medicine specialties if he or she is to be effective in preventing and treating injuries to the athlete.^{4,15} A national Board of Certification has established specific requirements that must be met

for an individual to become certified as an athletic trainer.⁴ These requirements include a combination of both academic coursework and clinical experience in athletic training settings (see Appendix B).^{4,31} Once these requirements for certification have been met and the individual passes a certification exam, that person earns the credential **ATC**.⁴ (*In this text all references to athletic trainers imply that this individual has met the requirements for certification set forth by the Board of Certification.*) *Focus Box 1-2* further clarifies the differences between an athletic trainer and a personal fitness trainer. The specific roles and responsibilities of the athletic trainer will differ and, to a certain extent, will be defined by the situation in which he or she works.³¹ Different states have different requirements as to who can call themselves an athletic trainer. It should be reemphasized that athletic trainers working with athletes should be certified athletic trainers (ATC).

ATC Credential of an individual who is certified as an athletic trainer.

Injury/Illness Prevention and Wellness Promotion

A primary responsibility of the athletic trainer is to educate the athletes and manage risks by making the competitive environment as safe as possible to reduce the likelihood of injury. The athletic trainer is responsible for organizing/arranging physical examinations and preparticipation screenings to identify

Roles and responsibilities of the athletic trainer

- Injury/illness prevention and wellness promotion
- Examination, assessment, and diagnosis
- Immediate and emergency care
- Therapeutic intervention
- Health care administration and professional responsibilities

conditions that predispose an athlete to injury (see Chapter 2), and educating parents, coaches, and athletes about the risks inherent to sports participation. Injury prevention includes (1) ensuring appropriate training and conditioning of the athlete (see Chapter 4); (2) monitoring environmental conditions to ensure safe participation (see Chapter 7); (3) selecting, properly fitting, and maintaining protective equipment (see Chapter 6); (4) explaining the importance of proper nutrition (see Chapter 5) and having a healthy lifestyle; and (5) using medications appropriately.

Examination, Assessment, and Diagnosis The athletic trainer must be skilled in recognizing the nature and extent of an injury through competency in injury evaluation. The athletic trainer must be able to efficiently and accurately evaluate an injury (see Chapter 8). The athletic trainer is responsible for referring the injured athlete to appropriate medical care or support services.

Immediate and Emergency Care Once the initial on-the-field assessment is done, the athletic trainer then must assume responsibility for administering appropriate first aid to the injured athlete and for making correct decisions in the management of acute injury (see Chapter 8).^{8,36} Thus the athletic trainer must possess

A basketball player suffers a grade 2 ankle sprain during midseason of the competitive schedule. After a 3-week course of rehabilitation, most of the athlete's pain and swelling has been eliminated. The athlete is anxious to get back into practice and competitive games as soon as possible, and subsequent injuries to other players have put pressure on the coach to force this player's return. Unfortunately, the athlete is still unable to perform functional tasks (cutting and jumping) essential in basketball.

? Who is responsible for making the decision regarding when the athlete can fully return to practice and game situations?

sound skills not only in the initial recognition and evaluation of potentially serious or life-threatening injuries but also in emergency care.

The athletic trainer is required to be certified in CPR/AED and should be certified in first aid by the American Red Cross or the National Safety Council.

Therapeutic Intervention An athletic trainer must be proficient in designing and supervising rehabilitation and reconditioning protocols that make use of appropriate rehabilitative equipment, manual (hands on) therapy techniques, or therapeutic modalities (see Chapter 12). In certain settings the

athletic trainer may work closely with physical therapists and/or strength and conditioning specialists in designing functional return to play activities.

Athletic trainers should also recognize patients that may exhibit abnormal social, emotional, and mental behaviors. They should also be able to recognize the role of mental health in injury and recovery, and use intervention strategies to maximize the connection between mental health and restoration of participation. If the athletic trainer recognizes that a problem exists, he or she should refer the patient to the appropriate medical personnel for intervention.²⁸

Health Care Administration and Professional Responsibilities The athletic trainer is responsible for the organization and administration of the athletic training program, including maintaining health and injury records for each athlete, developing emergency action plans, requisitioning and maintaining an inventory of necessary supplies and equipment, submitting insurance information to insurance companies, supervising assistants, providing athletic training for students, and establishing policies and procedures for day-to-day operation of the athletic training program (see Chapter 2).

The athletic trainer must educate the general public, in addition to a large segment of the various allied medical health care professions, as to exactly what athletic trainers are and what their roles and responsibilities are. This education is perhaps best accomplished by holding professional seminars, publishing research in scholarly journals, meeting with local and community organizations, and, most important, doing a good and professional job of providing health care to the injured athlete.³⁴

Responsibilities of the Team Physician

The team physician assumes a number of roles and responsibilities with regard to injury prevention and the health care of the athlete.^{1,2,20,27}

Compiling Medical Histories The team physician should be responsible for compiling medical histories and conducting physical examinations for each athlete, both of which can provide critical information that may reduce the possibility of injury.³⁷ Pre-participation screening by both the athletic trainer and physician is important in establishing baseline

Team physicians must have absolute authority in determining the health status of an athlete who wishes to participate in the sports program.