Principles of Athletic Training

Sixteenth Edition

A Guide to Evidence-Based Clinical Practice

William E. Prentice

Mc Graw Hill Education

Principles of

ATHLETIC TRAINING

A Guide to Evidence-Based Clinical Practice

SIXTEENTH EDITION

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

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

Mc Graw Hill Education

PRINCIPLES OF ATHLETIC TRAINING: A GUIDE TO EVIDENCE-BASED CLINICAL PRACTICE, SIXTEENTH EDITION

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Brief Contents

Contents

Appendixes

Preface

PHILOSOPHY

Since the first edition of *Principles of Athletic Training* was published in 1963, the profession of athletic training has experienced amazing growth, not only in numbers but also in the associated body of knowledge. During all those years and in fifteen previous editions, the authors of this text, Daniel Arnheim, John Klafs, and now Bill Prentice, have taken it as a personal responsibility to provide the reader with the most current clinical information in athletic training and sports medicine. It has always been based on the most current research evidence and, consequently, it has endured as one of the preeminent textbooks for athletic training students and professionals for more than 50 years.

The text is designed to lead the student from general foundations to specific concepts relative to injury prevention, evaluation, management, and rehabilitation. As with other health care professions, the gold standard for athletic trainers is to make decisions about the clinical care of individual patients based on the current best available evidence in the professional literature to achieve the most optimal patient outcomes. It has always been important for this text to address all of the competencies and clinical proficiencies that the profession has identified as critical relative to both the education of our students and to the practice of athletic training. The changes, updates, and additions to this sixteenth edition are a reflection of my commitment and passion toward continuing Dan Arnheim's and John Klafs's tradition.

THE ATHLETIC TRAINER AS A HEALTH CARE PROVIDER

Over the years since the origins of the athletic training profession in the 1930s, the majority of athletic trainers have been employed at colleges and universities, and in secondary schools, providing services almost exclusively to an athletic population. Historically, this work environment has been referred to as the "traditional setting" for employment for athletic trainers.

During the past decade, the role of the athletic trainer has gradually evolved into one that is unquestionably more aligned with that of a health care provider. Today, more than 40 percent of certified athletic trainers are employed in clinics and hospitals or in industrial and occupational settings, working under the direction of a physician as physician extenders. Although many athletic trainers continue to work in colleges, universities, and secondary schools, others can be found working as health care providers in all kinds of professional sports, including rodeo and NASCAR; in performing arts and the entertainment industry; in medical equipment sales and support; in the military; with law enforcement departments; and with government agencies, including NASA, the U.S. Senate, and the Pentagon.

This expansion of potential employment settings has forced the profession not only to change the methods by which health care is delivered to a variety of patient populations but also to change athletic training education programs to teach and/or establish professional competencies and proficiencies that are universal to all settings.

Depending on the employment settings in which they work, athletic trainers no longer provide health care only to athletes, nor do they only provide health care to individuals who are injured as a result of physical activity. Thus, the athletic trainer is more closely aligned with other allied health professionals, and athletic training has gained recognition as a clinical health care profession.

WHO IS IT WRITTEN FOR?

Principles of Athletic Training: A Guide to Evidence-Based Clinical Practice should be used by athletic trainers in courses concerned with the scientific, evidence-based, and clinical foundations of athletic training and sports medicine. Practicing athletic trainers, physical therapists, and other health care professionals involved with physically active individuals will also find this text valuable.

CONTENT ORGANIZATION

The 29 chapters in the sixteenth edition are organized into six sections: Professional Development and Responsibilities, Risk Management, Pathology of Sports Injury, Management Skills, Musculoskeletal Conditions, and General Medical Conditions.

As in previous editions, developing the sixteenth edition included serious consideration and incorporation of suggestions made by students, as well as detailed feedback from reviewers and other respected authorities in the field. Consequently, this sixteenth edition reflects the major dynamic trends in the field of athletic training and sports medicine. Furthermore, it is my hope that this newest edition will help prepare students to become competent health care professionals who will continue to enhance the ongoing advancement of the athletic training profession.

In addition to the inclusion of material that focuses on evidence-based practice, this newest edition continues to undergo changes in content. The changes and additions are reflective of the ever-increasing body of knowledge that is expanding the scope of practice for the athletic trainer.

Throughout the text, information relevant to athletic trainers working in a variety of employment settings is included. As is the case for those working in secondary

schools and colleges or universities, athletic trainers working in clinical, hospital, corporate, or industrial settings must be competent in preventing and recognizing injuries, and supervising injury rehabilitation programs. However, staff athletic trainers working in these settings treat and rehabilitate a wider range of patients both in terms of age and physical condition. The athletic trainer may provide care to pediatric, adolescent, young adult, adult, and geriatric patients. Patients may have physical ailments that may or may not be related to physical activity.

WHAT IS NEW IN THIS EDITION?

This latest edition of *Principles of Athletic Training: A Guide to Evidence-Based Clinical Practice* continues to evolve in concert with the profession. Historically, the authors have tried diligently to stay on the cutting edge of the athletic training profession with regard not only to presenting a comprehensive and ever expanding body of knowledge but also with the latest techniques of delivering educational content to students. Most evident in this edition is the replacement of many of the older photos, and the addition of new photos to better illustrate the injuries, conditions, or clinical techniques described in the text. In addition to the hard copy of this text, the author has created an online library of approximately 1,400 instructional videos that clearly demonstrate specific clinical techniques, injury evaluation skills, rehabilitative exercises, and manual therapy skills that are used by experienced athletic trainers. There is also an online eBook version of this text that will facilitate direct access to the instructional videos from within the body of the text.

CHAPTER-BY-CHAPTER ADDITIONS

One of the objectives throughout this text has been to incorporate the best available evidence to support the recommendations being made relative to patient care. The strength of those recommendations (SoR) based on the NATA Position, Official, and Consensus statements is identified within the text and can easily be found next to the reference where appropriate.

For the special tests presented in Chapters 18 to 25, the specificity, sensitivity, and positive and negative likelihood ratios are included wherever possible to show the usefulness and diagnostic accuracy of each of those tests based on the best available evidence in the literature.

Chapter 1

- Added information on the Youth Sport Safety Alliance and their Secondary School Student Athletes Bill of Rights
- Added new information on the athletic trainer's role in managing athletes with disabilities
- Updated the information on rating the levels of evidence and the strength of recommendations
- Expanded the section on patient-related outcome measures
- Added new table listing the outcome measures most often used by sports medicine professionals
- Added information on the CAATE decision to establish the entry-level degree for professional practice for athletic trainers at the masters level
- Update Board of Certification requirements for certification and continuing education

Chapter 2

- Added new information on establishing a crisis management plan
- Updated information on electronic medical records
- Reorganized, expanded, and updated the information on pre-participation exams
- Replaced old versions with new updated medical history and physical examination forms

Chapter 3

- Clarified information on negligence
- Added new information and a focus box explaining the Affordable Care Act
- Replaced outdated form with a new Student-Athlete Insurance Information form

Chapter 4

- Updated information on newest guidelines and recommendations for continuous training relative to intensity of the activity
- Updated information on high-intensity interval training
- Updated information on fartlek training
- Updated information on weight-bearing exercises

Chapter 5

- Updated new 2016 Food label
- Updated information on vegetarian diets
- Updated the calorie table for fast foods
- Added new section on Dual Energy X-ray Absorptiometry (DXA)
- Added new information on binge eating disorder

Chapter 6

- Updated NCAA-mandated guidelines for acclimatization in preseason football practices
- Updated revised information from the NATA 2015 position statement on exertional heat illness
- Changed classification of hyponatremia, which is no longer classified as an exertional heat illness
- Updated information on lightning safety

Chapter 7

- Updated table on equipment regulatory agencies
- Updated information on the selection and fitting of the newest available football helmets
- Included updated information on the effectiveness of soccer headgear

Chapter 8

- Updated the information on the effectiveness of using ankle braces versus ankle taping

Chapter 9

- Updated information on the cause of muscle cramps
- Revised information on tendinopathies to clarify the differences between tendinitis and tendinosis

Chapter 10

- Revised and clarified information on the gate control theory of pain management

Chapter 11

- Updated information on mental disorders
- Updated the keys for referring patients with mental disorders for further care

Chapter 12

- Added new information on medical "time-outs"
- Reorganized and updated new 2015 guidelines for CPR
- Added new acronym POLICE and updated discussion of acute care for musculoskeletal injuries
- Added new inter-association recommendations for removal of facemask, helmet, and shoulder pads
- Added new recommendation for treating patients with suspected cervical spine injuries, including immobilization and placing the patient on a spineboard, scoop stretcher, or vacuum mattress

Chapter 13

- Reorganized the order of topic presentation throughout to create a more logical flow of information
- Added a new discussion and photos of various functional screening tests
- Added a new discussion on applying the best available evidence in clinical decision making, including sensitivity, specificity, likelihood ratios, and more.
- Updated information and replaced all of the photos for various imaging techniques
- Added new information on refractometers

Chapter 14

- Updated the most current information regarding the immune system
- Updated the most recent worldwide and U.S. statistics in HIV and AIDS

Chapter 15

- Updated the section on shortwave diathermy
- Added new discussion of dry needling technique
- Replaced most of the pictures with updated photos of the latest therapeutic modality devices

Chapter 16

- Added new information on the mental aspects of dealing with the stress of rehabilitating an injury
- Updated information on the Graston technique
- Added new information on structural integration
- Added new information on postural restoration

Chapter 17

- Updated the table of the list of drug classifications and definitions
- Updated the athletic trainers guide to frequently used drugs

Chapter 18

- Introduced the concept of the "core" in the foot
- Clarified the functions of absorption and propulsion in the foot as they apply to pronation and supination
- Added new special tests: Mulder's test and the Dorsiflexion-Eversion test
- Updated information on using orthotics to enhance foot control

Chapter 19

- Added new special test for the ankle: the Cotton test.
- Added clinical prediction rules for the ankle joint
- Updated information on the most recent management and rehabilitation techniques for ankle sprains
- Emphasized the importance of balance training in patients with chronic ankle instability

Chapter 20

- Added clinical prediction rules for the knee
- Updated information on shoe types and the relationship to knee injuries
- Updated most recent information on the mechanisms that cause injuries to the ACL
- Updated information on the most current strategies for preventing knee injuries

Chapter 21

- Updated information about the mechanism and treatment of hamstring injuries
- Added additional special test for the hip including: flexion-internal rotation test, scour test, patellar-pubic percussion test, resisted hip abduction test, and Craig's test
- Added new clinical prediction rules for the hip

Chapter 22

- Added new special test: the Rent test
- Added new clinical prediction rules for the shoulder

Chapter 23

- Added new special tests: the elbow-extension test and moving valgus stress test
- Updated etiology for ulnar collateral ligament injury
- Updated information on medial and lateral epicondylitis

Chapter 24

- Added clinical prediction rule for carpal tunnel syndrome
- Updated and replaced the majority of the photos

Chapter 25

- Added new tests: Stork test, Gillet test, Gaenslen's test, thigh thrust rest, sacral thrust test, and prone instability test
- Added clinical prediction rules for the spine

Chapter 26

- Updated the ever-changing information on prevention, assessment, and management of concussion
- Added the latest version of the Sport Concussion Assessment Tool 3 (SCAT3)
- Updated information where appropriate on facial, dental, eye, ear, and nasal injuries

Chapter 28

- Replaced almost all of the photos depicting the various types of skin diseases and disorders

Chapters 27 and 29

- Updated both chapters with the latest medical information on organs and body systems, general medical conditions to help the athletic trainer with recognition, management, and referral decisions

INSTRUCTOR RESOURCES

These resources include invaluable information to accompany the sixteenth edition of *Principles of Athletic Training*, including key terminology, lecture outlines, and worksheets with the accompanying answer keys. It also integrates the text with image clips. These components can be accessed via the Instructor Resources tab within Connect®.

Test Bank

The test bank includes approximately 2,000 examination questions. Each chapter contains true-false, multiple choice, and completion test questions. The worksheets in each chapter also include a separate test bank of matching, short-answer, listing, essay, and personal or injury assessment questions that can be used as self-testing tools for students or as additional sources for examination questions.

Computerized Test Bank

McGraw-Hill's EZ Test is a flexible and easy-to-use electronic testing program. The program allows instructors to create tests from book specific items. It accommodates a wide range of question types and instructors may add their own questions. Multiple versions of the test can be created, and any test can be exported for use with course management systems such as WebCT, BlackBoard, or PageOut. The program is available for Windows and Macintosh environments.

PowerPoint Presentation

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 Instructor Resources tab in Connect®.

Instructional Videos

Instructional videos are available on Connect® *for Principles of Athletic Training*. These visual aids are designed to illustrate key concepts, promote critical thinking, and engage students on the most relevant topics in athletic training.

Connect® for *Principles of Athletic Training*.

Connect is an online learning system composed of interactive exercises and assessments, like those that appear on the new Board of Certification exam. Videos, animations, and other multimedia features enable students to visualize complicated concepts and practice skills. All of the activities are automatically graded and can be submitted to the instructor's grade book. For more information, visit connect.mheducation.com

Connect® for Principles of Athletic Training was developed by Amanda Benson, PhD, ATC, from Louisiana State University, and Linda Bobo, PhD, ATC, from Stephen F. Austin Slate University, and has been updated for the new edition. Connect® is a Web-based assignment and assessment platform that gives students the means to better connect with their coursework, their instructors, and the important concepts that they need to know for success now and in the future. Students can practice important skills at their own pace and on their own schedule, receive instant feedback on their work, and track performance on key activities. With Connect®, students get 24/7 online access to an eBook—an online edition of the text—to aid them in successfully completing their work, wherever and whenever they choose. With Connect®, instructors can deliver assignments, graphing questions, quizzes, and tests easily online.

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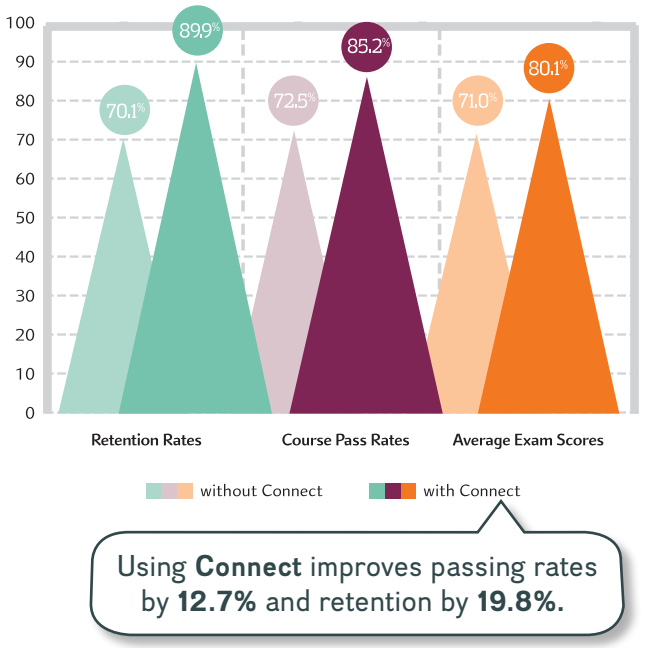

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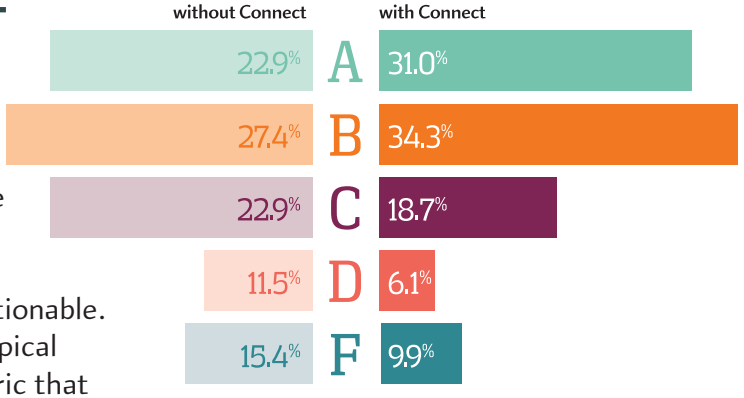

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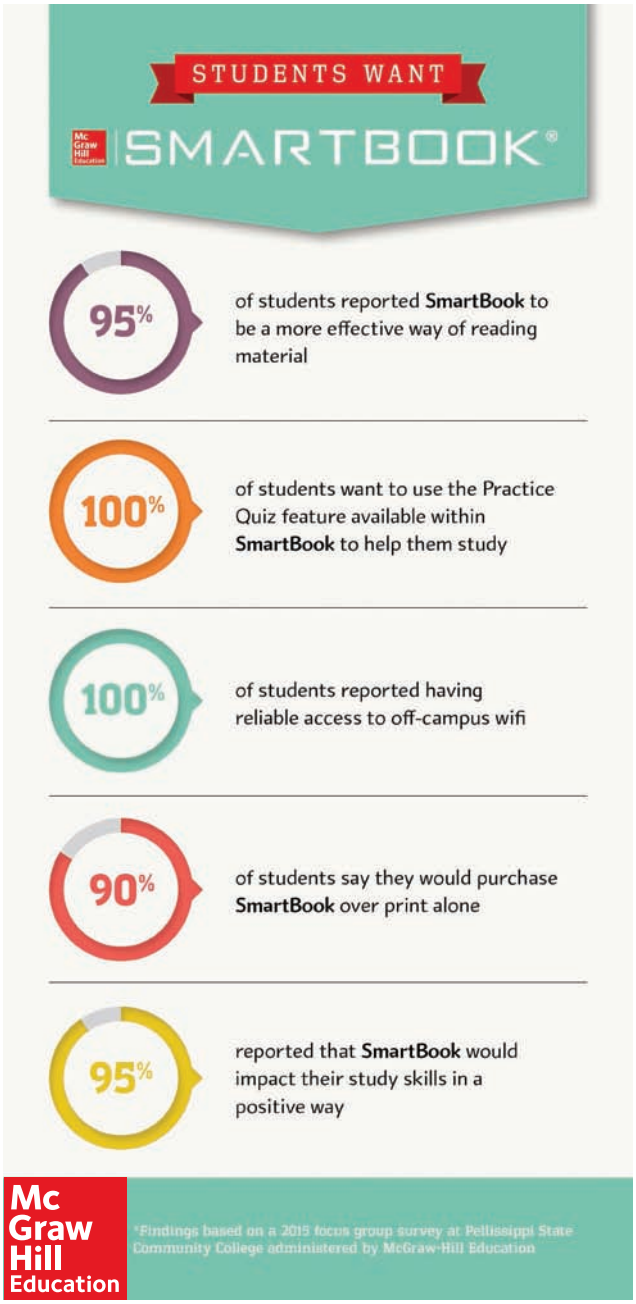

Acknowledgments

I would like to express my sincere appreciation to my Developmental Editor, Gary O'Brien who, as always, has provided invaluable guidance throughout the development of this edition. In truth, Gary should share authorship with me on this project. Through his efforts he has demonstrated ownership and a personal investment in making this text the best it can be. His input, patience with me, and dedication to this project has been indispensable and I truly respect his opinions and direction on all of our projects. I would be hard pressed to complete any of our projects without his help.

For this revision, instead of having a reviewer take on the daunting and time-consuming task of reviewing all 29 chapters of this 1,000+ page text, I identified specific individuals who have distinguished themselves as content experts to review a specific chapter or, in some cases, chapters related to their area of expertise. These reviewers have provided critical, constructive, detailed comments and suggestions relative to the existing content in each chapter based on the most current and best available evidence in the professional literature. They have also offered suggestions for specific updates or additions that needed to be made and identified material that was no longer supported by the available evidence.

I cannot thank them enough for being part of this revision process. I sincerely appreciate their interest and commitment in helping to continue the legacy of this book as an important resource in the education of our students.

Bruce Baldwin, OD, PhD
University of North Carolina at Chapel Hill

Joel Beam EdD, ATC
University of North Florida

Helen Binkley, PhD, ATC
Middle Tennessee State University

Damien Clement, PhD, ATC
West Virginia University

Lindsay Distefano, PhD, ATC
University of Connecticut

Doug Halverson, MA, ATC
University of North Carolina at Chapel Hill

Michael Higgins, PhD, ATC, PT
Towson University

Kim Jones, MD
University of North Carolina at Chapel Hill

Lisa Jutte, PhD, ATC
Xavier University

Kristin Kuchera, PhD, ATC
University of North Carolina at Chapel Hill

James "Mick" Lynch, MD
Florida Southern University

Jill Manners, EdD, ATC
Western Carolina University

Janis Matson, MA
University of North Carolina at Chapel Hill

Patrick McKeon, PhD, ATC
Ithaca College

Johna Mihalik, PhD, ATC
University of North Carolina at Chapel Hill

Jennifer O'Donoghue, PhD, ATC
North Carolina State University

Barbara Osborne, JD
University of North Carolina at Chapel Hill

Sakiko Oyama, PhD, ATC
University of Texas San Antonio

Jody Padua, OT
Occupational Therapy Consultant-Chapel Hill

Kathryn Pietrosimone, PhD
University of North Carolina at Chapel Hill

Eric Rivera, DDS
University of North Carolina at Chapel Hill

Christine Rosenbloom, PhD, RD
Nutrition Consultant- Atlanta Georgia

Amy Sauls, PharmD
University of North Carolina at Chapel Hill

Jason Scibek, PhD, ATC
Duquesne University

Jay Scifers, DsPT, ATC, PT
Moravian College

Carrie Shearer, MS, PT, ATC
University of North Carolina at Chapel Hill

Abbie Smith-Ryan, PhD
University of North Carolina at Chapel Hill

Erik Swartz, PhD, ATC
University of New Hampshire

Tim Uhl, PhD, ATC, PT
University of Kentucky

Erik Wikstrom, PhD, ATC
University of North Carolina at Chapel Hill

Gary Wilkerson, PhD, ATC
University of Tennessee at Chattanooga

Steve Zinder, PhD, ATC
University of South Florida

Finally, I want to thank my wife, Tena, and our sons, Brian and Zach, for their enduring support and encouragement. They constantly help me to keep my perspective on both my professional and personal life.

William E. Prentice

Applications at a Glance

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PART I

Professional Development and Responsibilities

1

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The Athletic Trainer as a Health Care Provider

Objectives

When you finish this chapter you should be able to

- Recognize the historical foundations of athletic training.
- Identify the various professional organizations dedicated to athletic training and sports medicine.
- Identify various employment settings for the athletic trainer.
- Differentiate the roles and responsibilities of the athletic trainer, the team physician, and the coach.
- Define evidence-based practice as it relates to the clinical practice of athletic training.
- Explain the function of support personnel in sports medicine.
- Discuss certification and licensure for the athletic trainer.

Outline

Key Terms

patient
athletic training clinic
evidence-based practice
PICO
ATC

Connect Highlights

Visit connect.mcgraw-hill.com for further exercises to apply your knowledge:

- Clinical application scenarios covering professional role responsibilities
- Click-and-drag question format covering professional organizations, BOC domains, and support personnel
- Multiple-choice questions covering history of athletic training, employment settings, and certification and licensure for the athletic trainer

Athletic trainers are health care professionals who specialize in preventing, recognizing, managing, and rehabilitating injuries. In cooperation with physicians, other allied health personnel, administrators, coaches, and parents, the athletic trainer functions as an integral member of the health care team in clinics, secondary schools, colleges and universities, professional sports programs, and other athletic health care settings. As you will see throughout the course of this text, athletic trainers provide a critical link between the medical community and individuals who participate in all types of physical activity (Figure 1–1).

The certified athletic trainer is a highly educated and skilled professional specializing in health care for the physically active.

FIGURE 1–1 The field of athletic training provides a critical link between the medical community and the physically active individual.
© William E. Prentice

HISTORICAL PERSPECTIVES

Early History

The drive to compete was important in many early societies. Sports developed over a period of time as a means of competing in a relatively peaceful and nonharmful way. Early civilizations show little evidence of highly organized sports. Evidence indicates that in Greek and Roman civilizations there were coaches, trainers (people who helped the athlete reach top physical condition), and physicians (such as Hippocrates and Galen) who assisted the athlete in reaching optimum performance. Many of the roles that emerged during this early period are the same in modern sports.

The history of athletic training draws on the disciplines of exercise, medicine, physical therapy, physical education, and sports.

For many centuries after the fall of the Roman Empire, there was a complete lack of interest in sports activities. Not until the beginning of the Renaissance did these activities slowly gain popularity. Athletic training as we know it came into existence during the late nineteenth century with the firm establishment of intercollegiate and interscholastic athletes in the United States. Because the first athletic trainers of this era possessed no technical knowledge, their athletic training techniques usually consisted of a rub, the application of some type of counterirritant, and occasionally the prescription of various home remedies and poultices. It has taken many years for the athletic trainer to attain the status of a well-qualified allied health care professional.[69]

Evolution of the Contemporary Athletic Trainer

The terms *training* and *athletic training, trainer,* and *athletic trainer* are often used interchangeably and are frequently confused with one another. Historically, *training* implies the act of coaching or teaching. In comparison, athletic training has traditionally been known as the field that is concerned with the athlete's health and safety. A trainer is someone who trains dogs or horses or functions in coaching or teaching areas. The *certified athletic trainer* is one who is a specialist in athletic training. Athletic training has evolved over the years to play a major role in the health care of a variety of patient populations in general and the athlete in particular. This evolution occurred rapidly after World War I with the appearance of the athletic trainer in intercollegiate athletics. During this period, the major influence in developing the athletic trainer as a specialist in preventing and managing athletic injuries came from the work of S. E. Bilik, a physician who wrote the first major text on athletic training and the care of athletic injuries, called *The Trainer's Bible,* in 1917.[8]

A certified athletic trainer provides health care to physically active individuals.

In the early 1920s, the Cramer family in Gardner, Kansas, started a chemical company and began producing a liniment to treat ankle sprains. Over the years, the Cramers realized that there was a market for products to treat injured athletes. In an effort to enhance communication and facilitate an exchange of ideas among coaches, athletic trainers, and athletes, Cramer began publication of *First Aider* in 1932. The members of this family were instrumental in the early development of the athletic training profession and have always played a prominent role in the education of athletic training students.[70]

During the late 1930s, an effort was made, primarily by several college and university athletic trainers, to establish a national organization named the National Athletic Trainers' Association (NATA). After struggling for existence from 1938 to 1944, the association essentially disappeared during the difficult years of World War II.

Between 1947 and 1950, university athletic trainers once again began to organize themselves into separate regional conferences, which would later become district organizations within NATA. In 1950, some 101 athletic trainers from the various conferences met in Kansas City, Missouri, and officially formed the National Athletic Trainers' Association. The primary purpose for its formation was to establish professional standards for the athletic trainer.[70] Since NATA was formed in 1950, many individuals have made contributions to the development of the profession.

After 1950, the growth of the athletic training profession has been remarkable. In 1974, when NATA membership numbers were first tracked, there were 4,500 members. Today those numbers have grown to more than 42,000 members. Certified athletic trainers can be found internationally with more than 500 working in 25 countries outside the United States. The majority of these are in Japan and Canada.[22] As the athletic training profession has grown and evolved over the last 50 years, many positive milestones have occurred that have collectively shaped the future direction of the profession, including the establishment of a certification exam; recognition of athletic trainers as health care providers; increased diversity of practice settings; the passage of practice acts that regulate athletic trainers in most states; third-party reimbursement for athletic training services; and ongoing reevaluation, revision, and reform of athletic training educational programs.

The Changing Face of the Athletic Training Profession

Over the years since the origins of the athletic training profession in the 1930s, the majority of athletic trainers have been employed at colleges and universities and in secondary schools, providing services almost exclusively to an athletic population. Historically, this work environment has been referred to as the "traditional setting" for employment for athletic trainers.

Today the role of the athletic trainer has gradually evolved into one that is unquestionably more aligned with that of a health care provider. More than 40 percent of certified athletic trainers are employed in clinics and hospitals, or in industrial and occupational settings working under the direction of a physician as athletic trainers in physician practice. Although many athletic trainers continue to work in colleges, universities, and secondary schools, others can be found working as health care providers in hospitals; all kinds of professional sports, including rodeo and NASCAR; in industrial settings; in performing arts and the entertainment industry; in medical equipment sales and support; in the military; with law enforcement departments; and with government agencies, including NASA, the U.S. Senate, and the Pentagon.

This expansion of potential employment settings has forced the profession not only to change the methods by which health care is delivered to a variety of patient populations but also to change athletic training education programs to teach and/or establish professional competencies and proficiencies that are universal to all settings.

Depending on the employment settings in which they work, athletic trainers no longer provide health care only to athletes, nor do they provide health care only to individuals who are injured as a result of physical activity. Additionally, the desire to align the athletic trainer more closely with other allied health professionals and to establish athletic training as a clinical health care profession has necessitated changes in terminology that has been "traditionally" accepted as appropriate.

Certainly, athletic trainers continue to work with athletes. It has been suggested that a more appropriate term to use when treating an athlete who sustains an injury is **patient** or *client*. Thus, throughout this text the term *athlete* is used to refer to a physically active individual who participates in recreational or organized sport activities who is not currently injured. Any individual who is ill or injured who is being treated by an athletic trainer is referred to as a *patient.*

It has also been recommended that instead of referring to treating athletes in the athletic training room, it is more appropriate to refer to treating patients in the athletic training clinic or facility. Thus, the term **athletic training clinic** is used to refer to a health care facility for treating individuals who have an illness or injury.

SPORTS MEDICINE AND ATHLETIC TRAINING

The Field of Sports Medicine

The term *sports medicine* refers generically to a broad field of health care related to physical activity and sport. The field of sports medicine encompasses 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 1–2). Those areas of specialization that are primarily concerned with performance enhancement include exercise physiology, biomechanics, sport psychology, sports nutrition, strength and conditioning coaches, and personal fitness training. Areas of specialization that focus more on injury care and management specific to the athlete are the practice of medicine, athletic training, sports physical therapy, sports massage therapy, sports dentistry, osteopathic medicine, orthotics/prosthetics, chiropractic, podiatry, and

Athletic training must be considered a specialization under the broad field of sports medicine.

FIGURE 1–2 Areas of specialization under the sports medicine "umbrella."

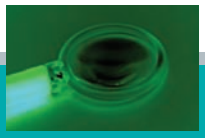
emergency medical technology. The American College of Sports Medicine (ACSM) has defined sports medicine as multidisciplinary, including the physiological, biomechanical, psychological, and pathological phenomena associated with exercise and sports.[3] The clinical application of the work of these disciplines is performed to improve and maintain an individual's functional capacities for physical labor, exercise, and sports. Sports medicine also includes the prevention and treatment of diseases and injuries related to exercise and sports.

Growth of Professional Sports Medicine Organizations

The twentieth century brought with it the development of a number of professional organizations dedicated to athletic training and sports medicine. Professional organizations have many goals: (1) to upgrade the field by devising and 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. The organizations identified below are presented in chronological order according to their year of establishment. Addresses, phone numbers, and/or Web sites for these and other related sports medicine organizations can be found in Appendix A in the back of this text.

Many professional organizations that are dedicated to achieving health and safety in sports developed in the twentieth century.

Several of these professional organizations also disseminate information to the general public about safe participation in sport activities in the form of guidelines or position statements. See *Focus Box 1–1:* "Key National Athletic Trainers Association Position, Official, Consensus, and Support Statements" for a list of statements addressing the practice of athletic training.



FOCUS 1–1 Focus on Healthcare Administration and Professional Responsibilities

Key National Athletic Trainers Association Position, Official, Consensus, and Support Statements

***Consensus Statements* (www.nata.org/news-publications/pressroom/statements/consensus)**

- *Inter-Association Consensus Statement on Best Practices for Sports Medicine Management for Secondary Schools and Colleges* (January 2014)
- *Appropriate Medical Care for Secondary School-Age* Athletes (2003)

***Official Statements* (www.nata.org/news-publications/pressroom/statements/official)**

- *Proper Supervision of Secondary School Student Aides* (2014)
- *Full-Time On-Site Athletic Trainer Coverage for Secondary School Athletic Programs* (2004)
- *Providing Quality Health Care and Safeguards to Athletes of All Ages and Levels of Participation* (December 2011)
- *Use of Qualified Athletic Trainers in Secondary Schools* (2004)

***Support Statements* (www.nata.org/news-publications/pressroom/statements/support)**

- *American Academy of Family Physicians' Support of Athletic Trainers for High School Athletes* (2007)
- *NCAA Support of Recommendations and Guidelines for Appropriate Medical Coverage of Intercollegiate Athletics* (August 2003)
- *American Medical Association's Support of Athletic Trainers in Secondary Schools* (1998)

Appendix B provides a complete listing of all position, consensus, official, and support statements developed by or with support from the National Athletic Trainers Association. Also listed in this appendix are specific Web sites where these statements may be found.

International Federation of Sports Medicine Among the first major organizations was the Fédération Internationale de Médecine du Sport (FIMS). In English it is called the International Federation of Sports Medicine. It was created in 1928 at the Olympic Winter Games in St. Moritz, Switzerland, by Olympic medical doctors with the principal purpose of promoting the study and development of sports medicine throughout the world. FIMS is made up of the national sports medicine associations of more than 100 countries. This organization includes many disciplines that are concerned with the physically active individual. To some degree, the ACSM has patterned itself after this organization.

American Academy of Family Physicians The American Academy of Family Physicians (AAFP) was founded in 1947 to promote and maintain high-quality standards for family doctors who are providing continuing comprehensive health care to the public. AAFP is a medical association of more than 100,000 members. Many team physicians are members of this organization. It publishes *American Family Physician.*

National Athletic Trainers' Association Before the formation of the National Athletic Trainers' Association in 1950, athletic trainers occupied a somewhat insecure place in the athletic program. Since that time, as a result of the raising of professional standards and the establishment of a code of ethics, there has been considerable professional advancement. The stated mission of NATA is

> To enhance the quality of health care provided by certified athletic trainers and to advance the athletic training profession.

The association accepts as members only those athletic trainers who are properly qualified and who are prepared to subscribe to a code of ethics and to uphold the standards of the association. NATA currently has more than 42,000 members. It publishes a quarterly journal, *The Journal of Athletic Training,* and *Athletic Training Education Journal* online*,* and holds an annual convention at which members have an opportunity to keep abreast of new developments and to exchange ideas through clinical programs. The organization is constantly working to improve both the quality and the status of athletic training.

American College of Sports Medicine As discussed previously, the ACSM is interested in the study of all aspects of sports. Established in 1954, ACSM has a membership of more than 45,000, composed of medical doctors, doctors of philosophy, physical educators, athletic trainers, coaches, exercise physiologists, biomechanists, and others interested in sports. The organization holds national and regional conferences and meetings devoted to exploring the many aspects of sports medicine, and it publishes a quarterly magazine, *Medicine and Science in Sports and Exercise.* This journal includes articles in French, Italian, German, and English, and provides complete translations in English of all articles. It reports recent developments in the field of sports medicine on a worldwide basis.

American Orthopaedic Society for Sports Medicine The American Orthopaedic Society for Sports Medicine (AOSSM) was created in 1972 to encourage and support scientific research in orthopedic sports medicine; the organization works to develop methods for safer, more productive, and more enjoyable fitness programs and sports participation. Through programs developed by the AOSSM, members receive specialized training in sports medicine, surgical procedures, injury prevention, and rehabilitation. AOSSM's 3,000 members are orthopedic surgeons and allied health professionals committed to excellence in sports medicine. Its official bimonthly publication is the *American Journal of Sports Medicine.*

National Strength and Conditioning Association The National Strength and Conditioning Association (NSCA) was formed in 1978 to facilitate a professional exchange of ideas in strength development as it relates to the improvement of athletic performance and fitness and to enhance, enlighten, and advance the field of strength and conditioning.

NSCA has a membership of more than 30,000 professionals in 52 countries, including strength and conditioning coaches, personal trainers, exercise physiologists, athletic trainers, researchers, educators, sport coaches, physical therapists, business owners, exercise instructors, fitness directors, and students training to enter the field. In addition, the NSCA Certification Commission offers two of the finest and the only nationally accredited certification programs: the Certified Strength and Conditioning Specialist (CSCS) and the NSCA Certified Personal Trainer (NSCA-CPT). NSCA publishes both the *Journal of Strength and Conditioning Research* and *Strength and Conditioning.*

American Academy of Pediatrics, Council on Sports Medicine and Fitness The American Academy of Pediatrics, Sports Committee was organized in 1979. Its primary goal is to educate all physicians, especially pediatricians, about the special needs of children who participate in sports. Between 1979 and 1983, this committee developed guidelines that were incorporated into a report, *Sports Medicine: Health Care for Young Athletes,* edited by Nathan J. Smith, M.D.

American Physical Therapy Association, Sports Physical Therapy Section In 1981, the Sports Physical Therapy Section of the American Physical Therapy Association (APTA) was officially established. The mission

of the Sports Physical Therapy Section is "to provide a forum to establish collegial relations between physical therapists, physical therapist assistants, and physical therapy students interested in sports physical therapy." The Section and its 6,000 members promote the prevention, recognition, treatment, and rehabilitation of injuries in an athletic and physically active population through special interest groups (SIGs); provide educational opportunities through sponsorship of continuing education programs and publications; promote the role of the sports physical therapist to other health professionals; and support research to further establish the scientific basis for sports physical therapy. The Section's official journal is the *Journal of Orthopaedic and Sports Physical Therapy.*

NCAA Committee on Competitive Safeguards and Medical Aspects of Sports The National Collegiate Athletic Association (NCAA) Committee on Competitive Safeguards and Medical Aspects of Sports collects and develops pertinent information about desirable training methods, prevention and treatment of sports injuries, utilization of sound safety measures at the college level, drug education, and drug testing; disseminates information and adopts recommended policies and guidelines designed to further the objectives just listed; and supervises drug-education and drug-testing programs. Each year, this committee publishes the *Sports Medicine Handbook* that contains a wealth of continuously updated information related to sports medicine, which can be very useful to the athletic trainer.

National Academy of Sports Medicine The National Academy of Sports Medicine (NASM) was founded in 1987 by physicians, physical therapists, and fitness professionals; it focuses on the development, refinement, and implementation of educational programs for fitness, performance, and sports medicine professionals. According to its mission statement, "NASM is dedicated to transforming lives and revolutionizing the health and fitness industry through its unwavering commitment to deliver innovative education, solutions and tools that produce remarkable results." In addition to offering a fitness certification (Certified Personal Trainer) and performance certification (Performance Enhancement Specialist), NASM offers advanced credentials and more than 20 continuing education courses in a variety of disciplines. NASM serves more than 100,000 members and partners in 80 countries.

Other Health-Related Organizations Many other health-related professions, such as dentistry, podiatristry, and chiropractic, have, over the years, become interested in the health and safety aspects of sports. Besides national organizations that are interested in athletic health and safety, there are 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.

Other Sports Medicine Journals Other journals that provide an excellent service to the field of athletic training and sports medicine are *The International Journal of Sports Medicine,* which is published in English by Thieme-Stratton, Inc., New York; *The Journal of Sports Medicine and Physical Fitness,* published by Edizioni Minerva Medica SPA, ADIS Press Ltd., Auckland 10, New Zealand; the *Journal of Sport Rehabilitation* and *Athletic Therapy and Training*, both published by Human Kinetics Publishers, Inc., Champaign, Illinois; the *Physician and Sportsmedicine,* published by McGraw-Hill, Inc., New York; *Physical Therapy* and *Clinical Management,* both published by the American Physical Therapy Association, Fairfax, Virginia; *Physical Medicine and Rehabilitation Clinics* and *Clinics in Sports Medicine,* both published by W. B. Saunders, Philadelphia; *Training and Conditioning,* published by MAG, Inc., Ithaca, New York; *Sports Health*: *A Multidisciplinary Approach,* published by Sage in Thousand Oaks, California; and *Athletic Training and Sports Health Care*: *The Journal for the Practicing Clinician,* published by Slack Inc., in Thorofare, New Jersey.

There is a significant number of other journals that relate in some way to sports medicine. They are listed in Appendix C located at the end of this text.

EMPLOYMENT SETTINGS FOR THE ATHLETIC TRAINER

Opportunities for employment as an athletic trainer have changed dramatically in recent years. Athletic trainers no longer work only in athletic training clinics at the college, university, or secondary-school level. The employment opportunities for athletic trainers are more diverse than ever.[46] A discussion of the various employment settings follows (Table 1–1).

Clinics and Hospitals

Today, more than 40 percent of certified athletic trainers are employed in clinics and hospitals—more than in any other employment setting. The role of the athletic trainer varies from one clinic to the next. Athletic trainers may be employed in an outpatient ambulatory rehabilitation clinic working in general patient care; in hospital emergency rooms: as health, wellness, or performance enhancement specialists; or as clinic administrators. Their job may also involve ergonomic assessment, work hardening, CPR training, or occasionally overseeing drug-testing programs. They may also be employed by a hospital but work in a clinic. Other clinical athletic trainers are employed by a hospital, but work only in local secondary schools or small colleges for practice, game, or single event coverage. For the most part, private clinics have well-equipped facilities in which

The largest percentage of certified athletic trainers are employed in clinics and hospitals.

TABLE 1–1 Employment Settings for Athletic Trainers*

Clinic

- Hospital-based (employed by hospital; work in a clinic)
  - General patient care
  - Health/wellness/performance enhancement
  - Occupational/industrial (100%/split)
  - Administration
- Outpatient/ambulatory/rehabilitation clinic
  - General patient care
  - Health/wellness/performance enhancement
  - Occupational/industrial (100%/split)
  - Administration
- Physician-owned clinic (patient care or administration)
  - Orthopedic
  - Primary care
  - Family practice
  - Pediatric
  - Physiatry
  - Other
- Secondary school/clinic (employed by clinic; work in school)
  - Secondary school (100%)
  - Secondary school (split)
- Clinic, other

Hospital (work in a hospital but not in a hospital-based clinic)

- Administration
- Emergency department
- Orthopedics
- Other

Industrial/occupational (work on-site at an industrial or occupational facility)

- Clinic
- Ergonomics
- Health/wellness/fitness
- Other

Corporate (work for company that sells to the profession or in patient care for that company)

- Business/sales/marketing
- Ergonomics
- Health/wellness/fitness
- Patient care

College/university

- Professional staff/athletics/clinic
- Faculty/academic/research
- Split appointment
  - Division 1
  - Division 1AA
  - Division 2
  - Division 3
- Administration

Two-year institution

- Professional staff/athletics/clinic
- Faculty/academic/research
- Split appointment
- Administration

Secondary school (employed by school or district)

- High school (teacher/clinical/split)
  - Public
  - Private
- Middle school (teacher/clinical/split)
  - Public
  - Private

Professional sports

- Baseball, M
- Basketball, M/W
- Football, M
- Hockey, M
- Soccer, M/W
- Lacrosse, M
- Softball, W
- Golf, M/W
- Tennis, M/W
- Wrestling
- Boxing
- Rodeo
- Auto racing (NASCAR, Indy Car)

Amateur/recreational/youth sports

- Amateur (work for NGB, USOC, or amateur athletics)
- Recreational (work for municipal or recreational league or facility)
- Youth sports (AAU)

Performing arts

- Dance
- Theater
- Entertainment industry (Disney, casinos, tour bands)

Military/law enforcement/government

- Military (Air Force, Army, Navy, Marines, Coast Guard, Merchant Marines, National Guard)
  - Active duty/civilian
- Academy
- Administration
- Hospital/clinic
- Other
- Law enforcement
  - Local department or agency (police/fire/rescue)
  - State department or agency (police/investigation)
  - Federal department or agency (FBI, CIA, ATF)
- Government
  - Local
  - State
  - Federal (Senate, House, judicial)
  - Agencies (NASA, FDA)

Health/fitness/sports/performance enhancement clinics/clubs (work for franchise, chain, or independent club)

Independent contractor (work for themselves and are not employees)

*Modified from National Athletic Trainers' Association.

to work. In many sports medicine clinics, the athletic trainer may be responsible for formulating a plan to market or promote athletic training services offered by that clinic throughout the local community[30] (Figure 1–3A).

Athletic Trainers in Physician Practice Some athletic trainers work in clinics that are owned by physicians. Although virtually all athletic trainers work under the direction of a physician, those employed as an athletic trainer in physician practice actually work in the physician's office, where patients of all ages and backgrounds are being treated.[66] The educational preparation for athletic trainers allows them to function in a variety of domains, including injury prevention, evaluation, diagnosis, management and rehabilitation, health education, nutrition, training and conditioning, preparticipation physicals, and maintenance of essential documentation.[104] Although the contact with only the physically active population may not be as great as in other employment settings, the athletic trainer in physician practice can expect regular hours, few weekend or evening responsibilities, opportunity for growth, and, in general, better pay.[26,31] All these factors collectively make athletic trainer in physician practice positions attractive for the athletic trainer. Potentially, many new jobs can be created as physicians become more and more aware of the value that an athletic trainer, functioning as an athletic trainer in physician practice, can provide to their medical practice[24] (Figure 1–3B).

Industrial/Occupational Settings

It is becoming relatively common for industries to employ athletic trainers to oversee fitness and injury rehabilitation programs for their employees.[1] The athletic trainer working in an industrial or occupational setting must have a sound understanding of the principles and concepts of workplace ergonomics, including inspecting, measuring, and observing dimensions of the work space, as well as specific tasks that are performed at the workstation.[23] Once a problem has been identified, the athletic trainer must be able to implement proper adjustments to workplace ergonomics to reduce or minimize possible risks for injury. In addition to these responsibilities, athletic trainers may be assigned to conduct wellness programs and provide education and individual counseling. It is likely that many job opportunities will exist for the athletic trainer in industrial/occupational settings in the next few years (Figure 1–3C&D).

Corporate Settings

Opportunities are expanding for athletic trainers to use their educational background as preparation for working in business, sales, or marketing of products that other athletic trainers may use. Athletic trainers might also be employed by a company to administer health, wellness, and fitness programs or to provide some patient care to their employees.

Colleges or Universities

At the college or university level, clinical positions for athletic trainers vary considerably from institution to institution. In smaller institutions, the athletic trainer may be a half-time teacher in physical education and half-time athletic trainer. In some cases, if the athletic trainer is a physical therapist rather than a teacher, he or she may spend part of the time in the school health center and part of the time in athletic training. Increasingly at the college level, athletic training services are being offered to members of the general student body who participate in intramural and club sports. In most colleges and universities, the athletic trainer is full-time, does not teach, works in the department of athletics, and is paid by the institution. However, it has been suggested that athletic trainers at colleges and universities should be employed by the campus or student health services rather than by the athletic department.[15]

In February 1998, the NATA created the Task Force to Establish Appropriate Medical Coverage for Intercollegiate Athletics (AMCIA) to establish recommendations for the extent of appropriate medical coverage to provide the best possible health care for all intercollegiate student-athletes. Essentially, the AMCIA task force made recommendations for the number of athletic trainers who should be employed at a college or university based on a mathematical model created by a number of variables existing at each institution. These guidelines were revised and updated in 2003. (For directions to determine the recommended number of athletic trainers, consult "Recommendations and Guidelines for Appropriate Medical Coverage of Intercollegiate Athletics,"[68] see *Focus Box 1–1*.) In August 2003, the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports (CSMAS) recommended that NCAA institutions "examine the adequateness of their sports medicine coverage"[54]—in particular, whether the increased time demands placed on certified athletic trainers reduces their ability to provide high-quality care to all student-athletes. After reviewing the *Recommendations and Guidelines*, the CSMAS "encouraged NCAA institutions to reference the NATA AMCIA in their assessment of the adequateness of their sports medicine coverage . . . and share the responsibility to protect student athlete health and safety through appropriate medical coverage of its sports and supporting activities."

A number of athletic trainers working at colleges and universities are employed as faculty members.[40] These individuals may or may not be assigned clinical responsibilities. Instead, in addition to teaching responsibilities, these faculty members may serve as program directors and/or as researchers.

Secondary Schools

There are more than 42,000 public and private secondary schools in the United States. It would be ideal to have