



William E. Prentice

Principles of  
**Athletic  
Training**  
*A Competency-Based Approach*

*Fifteenth Edition*

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## Suggested Supplies

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### *Tape*

White adhesive, 1½-inch  
 White adhesive, 1-inch  
 Liteguard, 2-inch  
 Proformula, 1½-inch  
 Elastic, 3-inch  
 Elastic, 2-inch  
 Elastic, 1-inch  
 Pre wrap  
 Deriform knitted tape  
 Medi-rip, 2-inch  
 Patellofemoral tape  
 Clothwrap, 2-inch

### *Bandages*

Coverlet, 1½ × 2  
 Coverlet, 2 × 3  
 Coverlet knuckle  
 Coverlet strips  
 Telfa, 2 × 3  
 Telfa, 3 × 4  
 Band-Aid Clear Patches  
 Gauze, 4 × 4 (sterile)  
 Gauze, 3 × 3 (sterile)  
 Gauze, 2 × 2  
 Gauze cling, 4-inch (sterile)  
 Steri Strips, ½-inch  
 Steri Strips, ¼-inch  
 Steri Strips, ½-inch  
 Adaptic Dressing

### *Wraps*

Ace wraps, 3-inch  
 Ace wraps, 4-inch single  
 Ace wraps, 4-inch double  
 Ace wraps, 6-inch single  
 Ace wraps, 6-inch double

### *Foam and Felt*

1-inch felt

½-inch felt  
 ¼-inch felt  
 ¼-inch adhesive felt  
 ⅛-inch adhesive felt  
 ⅛-inch adhesive foam  
 ⅛-inch firm foam (gray)  
 ⅛-inch firm foam (black)  
 ¼-inch firm foam (black)  
 Moleskin  
 ½-inch blue memory foam  
 ¼-inch adhesive foam  
 ½-inch vinyl foam  
 ¼-inch vinyl foam  
 ¼-inch vinyl adhesive foam

### *Braces and Splints*

Finger splints  
 Toe splints  
 Foam padded finger, ¾-inch  
 Wooden splints  
 Air splint, leg  
 Air splint, foot  
 Velcro, 1-inch (both sides)  
 Knee immobilizers  
 Foot boot (medium, large)  
 Aircast, left  
 Aircast, right  
 Hexalite, 4-inch  
 Cervical collar (small, medium, large)  
 Toe caps  
 Heel cups (medium, large)  
 Patella strap, large  
 Fibrifoam Patt strap  
 Fibrifoam wrist/hand strap  
 Wrist immobilizer (left, right, universal)  
 Ankle braces (xx-small, x-small, small, medium, large, x-large)

Triangular bandage  
 Slings  
 Nose guard  
 Elbow sleeves  
 Neoprene shorts  
 Thigh sleeves pro (small, medium, large, x-large, xx-large)  
 Back support (x-small, small, medium, x-large)  
 Moldable back supports  
 Knee sleeves (x-small, small, medium, large, x-large)  
 Knee brace post-op  
 Splint cement  
 Silicone rubber adhesive  
 Silicone, 1 lb  
 Cramerol  
 Readi-Cast  
 Cotton roll, 4-inch  
 Stockinet, 3-inch  
 Elastomer Kits

### *Paper Products*

Towels (cases)  
 Cups (cases)  
 Scrub pants  
 Exam shorts  
 Pillowcases  
 Tampons

### *Modalities*

Ultrasound gel, 5 lb  
 Flex All, 1 gal  
 Cramergesic, 5-lb tub  
 Skin lube, 5-lb tub  
 Skin lube, 25-lb tub  
 Gray T-band  
 Black T-band  
 Heat packs (medium, large)

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Heat packs, neck	Tweezers	ReNu contact cleaning agent
Standard terry cover	Tweezers (sterile)	Penlights
Neck terry cover	Suture sets	<i>Teeth Treatment</i>
Fluorimethane	Nail clippers (large, small)	Blue mouth guards, 25/box
Cold spray	Tape cutters	Clear mouth guards, 25/box
Ice bags	Stethoscopes	<i>Oral Medications</i>
Ice bags, Cramer	Shark refill blades	Acetaminophen bottle
Kwik-heat pack	<i>Inhalants</i>	Acetaminophen, 2 pk
Cramer Atomic Rub Down	Afrin	Cepastat
Flexi-wrap (small, large)	<i>Antiseptics</i>	Chlorpheniramine, 4 mg
Flexi-wrap handles	Triadine	Diphenhydramine, 25 mg
Lotion, 1 gal	Peroxide	Ibuprofen bottle
<i>First Aid</i>	Rubbing alcohol	Ibuprofen, 2 pk
Cotton rolls (nose plugs)	Betasept, small bottles	Imodium AD
Tongue depressors	Betasept, 1-gal jug	Pepto-Bismol tabs
Pocket masks	Antimicrobial skin cleaner	Q-fed pkg
Cotton tip applicators	Super Quin 9	Sudodrin, 2 pk
Cotton tip applicators (sterile)	Zorbicide Spray	Titralac
Sani Cloths	<i>Skin Treatments</i>	Robitussin DM
Latex gloves (medium, large)	Polysporin	<i>Crutches</i>
Cotton balls	Bacitracin	Large
Skin-preps	1% tolnaftate powder	Medium
Save-A-Tooth	Lamisil	Small
Penlights	1% hydrocortisone	Large aluminum
Biohazard bags	Second skin	<i>Water</i>
Safety goggles	Collodion	Bottle carriers
<i>Taping Accessories</i>	2% miconazole	Water bottles
Heel and lace pads	10% hydrocortisone	Coolers (3-, 7-, 10-gal)
Tape adherent spray	Baby powder	Chest
Tape remover	Tincture of benzoin	<i>Other</i>
<i>Sharps</i>	<i>Eye Treatment</i>	Stools
Stainless steel prep blades	Dacriose Irrigation	Spray bottles
Scalpel blades, #10, #11 (sterile)	Saline	Bucket
Scissors bandage	Eye wash	Cloth towels
Scissors, small		

## Suggested Supplies

### *Tape*

White adhesive, 1½-inch  
White adhesive, 1-inch  
Liteguard, 2-inch  
Proformula, 1½-inch  
Elastic, 3-inch  
Elastic, 2-inch  
Elastic, 1-inch  
Pre wrap  
Deriform knitted tape  
Medi-rip, 2-inch  
Patellofemoral tape  
Clothwrap, 2-inch

### *Bandages*

Coverlet, 1½ × 2  
Coverlet, 2 × 3  
Coverlet knuckle  
Coverlet strips  
Telfa, 2 × 3  
Telfa, 3 × 4  
Band-Aid Clear Patches  
Gauze, 4 × 4 (sterile)  
Gauze, 3 × 3 (sterile)  
Gauze, 2 × 2  
Gauze cling, 4-inch (sterile)  
Steri Strips, ½-inch  
Steri Strips, ¼-inch  
Steri Strips, ½-inch  
Adaptic Dressing

### *Wraps*

Ace wraps, 3-inch  
Ace wraps, 4-inch single  
Ace wraps, 4-inch double  
Ace wraps, 6-inch single  
Ace wraps, 6-inch double

### *Foam and Felt*

1-inch felt  
½-inch felt  
¼-inch felt  
¼-inch adhesive felt  
⅛-inch adhesive felt  
⅛-inch adhesive foam  
⅛-inch firm foam (gray)  
⅛-inch firm foam (black)  
¼-inch firm foam (black)  
Moleskin  
½-inch blue memory foam  
¼-inch adhesive foam  
½-inch vinyl foam  
¼-inch vinyl foam  
¼-inch vinyl adhesive foam

### *Braces and Splints*

Finger splints  
Toe splints  
Foam padded finger, ¾-inch  
Wooden splints  
Air splint, leg  
Air splint, foot  
Velcro, 1-inch (both sides)  
Knee immobilizers  
Foot boot (medium, large)  
Aircast, left  
Aircast, right  
Hexalite, 4-inch  
Cervical collar (small, medium, large)  
Toe caps  
Heel cups (medium, large)  
Patella strap, large  
Fibrifoam Patt strap  
Fibrifoam wrist/hand strap  
Wrist immobilizer (left, right, universal)  
Ankle braces (xx-small, x-small, small, medium, large, x-large)

### Triangular bandage

Slings  
Nose guard  
Elbow sleeves  
Neoprene shorts  
Thigh sleeves pro (small, medium, large, x-large, xx-large)  
Back support (x-small, small, medium, x-large)  
Moldable back supports  
Knee sleeves (x-small, small, medium, large, x-large)  
Knee brace post-op  
Splint cement  
Silicone rubber adhesive  
Silicone, 1 lb  
Cramerol  
Readi-Cast  
Cotton roll, 4-inch  
Stockinet, 3-inch  
Elastomer Kits

### *Paper Products*

Towels (cases)  
Cups (cases)  
Scrub pants  
Exam shorts  
Pillowcases  
Tampons

### *Modalities*

Ultrasound gel, 5 lb  
Flex All, 1 gal  
Cramergesic, 5-lb tub  
Skin lube, 5-lb tub  
Skin lube, 25-lb tub  
Gray T-band  
Black T-band  
Heat packs (medium, large)  
Heat packs, neck  
Standard terry cover  
Neck terry cover  
Fluorimethane  
Cold spray  
Ice bags  
Ice bags, Cramer  
Kwik-heat pack  
Cramer Atomic Rub Down  
Flexi-wrap (small, large)  
Flexi-wrap handles  
Lotion, 1 gal

### *First Aid*

Cotton rolls (nose plugs)  
Tongue depressors  
Pocket masks  
Cotton tip applicators  
Cotton tip applicators (sterile)  
Sani Cloths  
Latex gloves (medium, large)  
Cotton balls  
Skin-preps  
Save-A-Tooth  
Penlights  
Biohazard bags  
Safety goggles

### *Taping Accessories*

Heel and lace pads  
Tape adherent spray  
Tape remover

### *Sharps*

Stainless steel prep blades  
Scalpel blades, #10, #11 (sterile)  
Scissors bandage  
Scissors, small

### Tweezers

Tweezers (sterile)  
Suture sets  
Nail clippers (large, small)  
Tape cutters  
Stethoscopes  
Shark refill blades

### *Inhalants*

Afrin

### *Antiseptics*

Triadine  
Peroxide  
Rubbing alcohol  
Betasept, small bottles  
Betasept, 1-gal jug  
Antimicrobial skin cleaner  
Super Quin 9  
Zorbicide Spray

### *Skin Treatments*

Polysporin  
Bacitracin  
1% tolnaftate powder  
Lamisil  
1% hydrocortisone  
Second skin  
Collodion  
2% miconazole  
10% hydrocortisone  
Baby powder  
Tincture of benzoin

### *Eye Treatment*

Dacriose Irrigation  
Saline  
Eye wash  
ReNu contact cleaning agent  
Penlights

### *Teeth Treatment*

Blue mouth guards, 25/box  
Clear mouth guards, 25/box

### *Oral Medications*

Acetaminophen bottle  
Acetaminophen, 2 pk  
Cepastat  
Chlorpheniramine, 4 mg  
Diphenhydramine, 25 mg  
Ibuprofen bottle  
Ibuprofen, 2 pk  
Imodium AD  
Pepto-Bismol tabs  
Q-fed pkg  
Sudodrin, 2 pk  
Titralac  
Robitussin DM

### *Crutches*

Large  
Medium  
Small  
Large aluminum

### *Water*

Bottle carriers  
Water bottles  
Coolers (3-, 7-, 10-gal)  
Chest

### *Other*

Stools  
Spray bottles  
Bucket  
Cloth towels

## Field Kit Supplies

Adhesive bandages:  
  regular (medium, large, X-large)  
  knuckle  
  patch  
  sterile strips  
Tape cutters  
Scissors  
Eye cover  
Save-A-Tooth  
Pseudoephedrine (bottle and dose)  
Acetaminophen (bottle and dose)  
Pepto-Bismol tablets  
Imodium AD caplets  
Ibuprofen tablets  
Diphenhydramine  
Dramamine  
Hydrocortizone cream  
A and D ointment  
Petroleum jelly  
Scalpels  
Razor blades  
Dacriose sterile eye irrigating solution  
Latex gloves  
Oral screw  
QDA spray  
Skin lube  
Gauze pads: 2 × 2, 3 × 3, or 4 × 4  
Heel cup  
Sling  
Hex-a-lite  
Betasept  
Titalac antacid  
Hydrogen peroxide  
Finger splints  
Cotton-tipped applicators  
Tongue depressors  
Flex All  
Lotion  
EpiPen  
Contact lens solution  
CPR mask  
Antiseptic hand cleaner  
Sunscreen  
Tape supplies: zonal, stretch, heel and lace pads, prewrap, 3-inch, 2-inch, 1-inch brown, 1-inch white, blood tape  
Ace wraps: 2-inch, 3-inch, 4-inch, 6-inch, double 4-inch, double 6-inch  
Alcohol  
Cramergesic  
Flex-wrap  
Adhesive foam

Adhesive felt  
Moleskin  
Penlight  
Stethoscope  
Ear thermometer  
Pens  
Self-stick notes  
Polysporin ointment  
Tongue forceps  
Tweezers  
Eye patch  
Dental sponges  
Ventolin inhaler  
Contact lens cases  
Contact lens wetting solution  
Scalpel blades

## Bruise Bag

Adhesive foam: 1 sheet, 18 inch × 11 inch  
Adhesive felt: 1 sheet, 18 inch × 11 inch  
Knee sleeves: large, x-large, xx-large (2 each)  
Elbow sleeves: large, x-large, xx-large (2 each)  
Knee brace: 2 lateral hinge  
Mouth guards: 25 moldable  
Ice bags: 10  
Air casts: right large, right x-large, left large, left x-large (1 each)  
Ace wraps: 2-inch, 4-inch, 6-inch, double 4-inch, double 6-inch (1 each)  
Back wraps: large, x-large (1 each)  
Lace-up ankle braces: right large, right x-large, left large, left x-large (1 each)  
Turf toe steel plates: right and left sizes: 14 and 10 (2 each)  
Foam padding: 24 inch 3 24 inch roll  
Philadelphia Collar  
Neck roll  
AC pads: 1 right, 1 left, 2 Lax pads  
Soft neck collar: 1  
Tape cutter: 2  
Thigh sleeves: large, x-large, xx-large (2 each)  
Spenco arch supports: size 5, size 3 (2 each)  
Spenco insoles: size 14, 11 (2 each)  
Wrist splints: right and left, large, x-large (2 each)  
Thigh pads: 2  
Knee pads: 2

## Sideline Emergency Supplies for the Physician

Automatic electric defibrillator (AED)  
Battery charger  
Bag mask resuscitator with oxygen tube  
Pocket mask  
Alcohol prep pads  
Adhesive tape  
IV starter kit  
IV bag solution  
Solution set (IV line)  
Latex gloves  
18-gauge IV catheter  
14-gauge IV catheter  
20cc syringe  
Epinephrine

## Items for the Field

6 10-gallon coolers for water and electrolyte drink  
4 pitchers  
Ice bags and ice chest with ice for ice bags  
Field kit  
Bruise bag  
Spine board  
Crutches  
Flatbed cart  
Personal kits (fanny packs)  
Emergency kit with oxygen  
Physio-Dyne  
Vacuum splints  
Water bottles  
Towels  
Water hose  
Extension cords

## Seasonal Supplies

Ice towels  
7-gallon coolers  
Port-a-cools with needed supplies  
Ice cans  
Electrolyte drink  
2 10-gallon coolers for electrolyte drink  
Cups  
7-gallon cooler with ice towels  
2 extra pitchers  
Bee and wasp spray  
Extra trash bags

*Principles of*

# ATHLETIC TRAINING

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A Competency-Based  
Approach

FIFTEENTH EDITION

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

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Department of Exercise and Sport Science  
The University of North Carolina at Chapel Hill  
Chapel Hill, North Carolina







PRINCIPLES OF ATHLETIC TRAINING: A COMPETENCY-BASED APPROACH, FIFTEENTH EDITION

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## PHILOSOPHY

The publication of this fifteenth edition marks the 50-year anniversary for this text! Since the first edition 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 those years, the authors of this text have taken it as a personal responsibility to provide the reader with the most current evidence-based and clinically based information available in athletic training and sports medicine. This text has always been considered by many as the leading text in this field.

Dr. Daniel Arnheim, the original and long term author of this text established its initial philosophy which continues with this edition. The text is designed to lead the student from general foundations to specific concepts relative to injury prevention, evaluation, management, and rehabilitation. As the student progresses from beginning to end, he or she will gradually begin to understand the complexities of the profession of athletic training. As in past editions, a major premise is that the student should be able to apply the appropriate techniques and concepts in the day-to-day performance of his or her job. The changes and additions in this fifteenth edition are a reflection of my commitment and passion toward continuing Dr. Arnheim'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% 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.

## ADDRESSING THE ATHLETIC TRAINING EDUCATIONAL COMPETENCIES

The Professional Education Council (PEC) established by the National Athletic Trainers' Association, is responsible for identifying the knowledge and skills that must be included in educational programs preparing students to enter the athletic training profession. The PEC developed a list of educational competencies according to eight domains that comprise the role of the athletic trainer. The athletic training educational programs that are accredited by the Committee for Accreditation of Athletic Training Education (CAATE), as well as those seeking accreditation, must integrate the extensive list of educational competencies into their curriculums. This move toward competency-based athletic training education programs enhanced the need for a comprehensive text for athletic training students. My goal in this fifteenth edition is to make certain that each and every one of the educational competencies identified by the Professional Education Council is specifically covered at some point in this text.

## WHO IS IT WRITTEN FOR?

*Principles of Athletic Training: A Competency-Based Approach* 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 fifteenth 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 fifteenth 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 fifteenth 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 addresses specific competencies, 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 Competency-Based Approach* 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 addition of photos showing pertinent surface anatomy landmarks and specific joint motions, as well as 3D photos showing primarily mechanisms of injury for a variety of conditions. In addition to the hard copy of this text, the author has created an online library of approximately 1300 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.

*Principles Connect* was developed by Amanda Benson, PhD., ATC from Troy University, and Linda Bobo, PhD., ATC from Stephen F. Austin State University. *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.

## CHAPTER-BY-CHAPTER ADDITIONS

### Chapter 1

- Material on the responsibilities of the athletic trainer according to the five domains identified in the latest Role Delineation Study has been reorganized
- New extensive discussion of the new competency that deals with evidence-based medicine and how the clinician should incorporate that into clinical practice
- Updated discussion on professional education of the athletic training student and addressed the reorganization of the 12 competency areas to eight
- Updated discussion of future directions for the athletic training profession

### Chapter 2

- New discussion and new Focus Box on what items should be included in a medical record

- New information on the transition from paper to electronic records
- New information on health maintenance and personal hygiene screening
- New discussion on sickle cell trait screening
- Additional information of the National High School Sports-Related Injury Surveillance Study

### Chapter 3

- Updated the discussion of efforts to obtain third-party reimbursement of athletic trainers

### Chapter 4

- Changed the title to “Fitness and Conditioning Techniques” to better reflect the material that is covered in this chapter

### Chapter 5

- Additional information on Food Labels
- New discussion of ChooseMyPlate
- New information on the glycemic index and selecting foods with a high GI
- New information on caffeine energy drinks

### Chapter 6

- New information and guidelines for measuring rectal temperature

### Chapter 7

- New photos showing the newest types of equipment
- Updated information on mouthguards
- Updated information on using cleated shoes

### Chapter 8

- Changed the terms *bandage* and *bandaging* to *wrap* and *wrapping*
- Repositioned figures and line drawings to be more closely aligned with text
- 

### Chapter 9

- Clarified distinction between tendinopathy and tendinitis
- Reorganized information on fractures

### Chapter 10

- New information on prolotherapy
- New information on platelet-rich plasma (PRP) injections

### Chapter 11

- New discussion of the cognitive appraisal model that better describes the athlete’s psychological reaction to injury

### Chapter 12

- Updated information on the latest American Red Cross techniques of CPR/AED
- New section on using airway adjunct devices, including manual suction, oropharyngeal airways, nasopharyngeal airways, and supraglottic airways
- Updated information on the recommended technique for placing an injured athlete on a spine board
- New section on using a cane

### Chapter 13

- New information on the positron emission tomography imaging technique
- New information on pulse oximetry
- New information on using a glucometer
- New information on using a peak flow meter

### Chapter 15

- Reorganized the way in which the therapeutic modalities are organized according to the types of energy they produce
- Clarified information on the Hunting Response
- Updated figure on types of waveforms

### Chapter 17

- Updated list of agencies and regulations that govern pharmaceutical care
- Updated list of information that must be included on prescription labels
- Updated procedure for using a metered dose inhaler
- Updated information on currently used and recommended medications throughout
- New information on abuse of crystal methamphetamine, ecstasy, ADHD medication, and oxycontin
- Updated list of drugs banned by the NCAA and USADA

### Chapters 18–25

- New photos in each of these chapters, showing (1) surface anatomy landmarks, (2) specific joint movements, and (3) 3-D photos to show mechanisms of injury for the most common injuries

## Chapter 26

- Information on concussions extensively updated and reorganized to include the latest findings
- New information on the widely used Sport Concussion Assessment Toll
- New guidelines for graduated return to play following concussion

## Chapter 27

- New photos showing surface anatomy landmarks and specific joint movements
- New information on traveler's diarrhea

## Chapter 28

- New photos showing different types of wounds
- New photos that better show the skin appearance

## Chapter 29

- Updated information on complex regional pain syndrome
- "Sexually transmitted infections (STIs)" changed to "sexually transmitted diseases (STDs)"

## INSTRUCTOR'S RESOURCE MATERIALS

### Connect Principles of Athletic Training

**Connect Principles of Athletic Training** developed by Dr. Amanda Andrews and Dr. Linda Stark-Bobo, is a new 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 [www.mcgrawhillconnect.com](http://www.mcgrawhillconnect.com).

### Instructor's Resources

Formerly the Instructor's Manual, this guide includes all the useful features of an Instructor's Manual, including learning objectives, brief chapter overviews, key terminology, discussion questions, class activities, worksheets, and the accompanying answer keys, media resources, and Web links. It also integrates the text with image clips and all the health and human performance resources McGraw-Hill offers including the Online Learning Center. The guide also includes references to relevant print and broadcast media.

## 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 CD-ROM

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

Developed for the fifteenth edition by Jason Scibek, PhD, ATC, of Duquense University, a comprehensive and extensively illustrated PowerPoint presentation accompanies this text for use in classroom discussion. The PowerPoint presentation may also be converted to outlines and given to students as a handout. You can easily download the PowerPoint presentation from the Online Learning Center at [www.mhhe.com/prentice15e](http://www.mhhe.com/prentice15e). Adopters of the text can obtain the login and password to access this presentation by contacting your local McGraw-Hill sales representative.

### Instructional Videos

Instructional videos are available on *Connect 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.

## ACKNOWLEDGMENTS

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*William E. Prentice*



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**Professional Development and Responsibilities**

# 1



## 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.

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### ■ Key Terms

---

patient	PICO
athletic training clinic	ATC
evidence-based practice	

Visit [connect.mcgraw-hill.com](http://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

**A**thletic 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

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

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).

## 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



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

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.<sup>64</sup>

### 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

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



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.<sup>8</sup>

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 student athletic trainers.<sup>65</sup>

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.<sup>65</sup> 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 34,000 members. Certified athletic trainers can be found internationally with more than 400 working in twenty-five countries outside the United States. The majority of these are in Japan and Canada.<sup>19</sup> 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.

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 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

**patient** ill or injured athlete.

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

**athletic training clinic** Health care facility.

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,

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

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,



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

chiropractic, podiatry, and 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.<sup>3</sup> 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 or at [www.mhhe.com/prentice15e](http://www.mhhe.com/prentice15e).

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. 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. Links to these statements can also be located at [www.mhhe.com/prentice15e](http://www.mhhe.com/prentice15e).

**International Federation of Sports Medicine** Among the first major organizations was the Federation Internationale de Medecine Sportive (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 34,000 members. It publishes a quarterly journal, *The Journal of Athletic Training*, and *Athletic Training Journal* on-line, 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, Sports Committee**

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; 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. This committee publishes the *Sports Medicine Handbook* that contains a wealth of information related to sports medicine, that 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, podiatry, 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.<sup>42</sup> 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; 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 see patients during the morning hours in the clinic. In the afternoons, athletic trainers' services are contracted out to local high schools or small colleges for practice, game, or single event

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

**TABLE I-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 IAA
  - 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
- 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.

coverage. For the most part, private clinics have well-equipped facilities in which 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<sup>27</sup> (Figure 1–3A).

**Physician Extenders** 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 a physician extender actually work in the physician’s office, where patients of all ages and backgrounds are being treated.<sup>61</sup> The educational preparation for athletic trainers allows them to function in a variety of domains, including injury prevention, evaluation, management and rehabilitation, health education, nutrition, training and conditioning, preparticipation physicals, and maintenance of essential documentation.<sup>98</sup> Although the contact with only the physically active population may not be as great as in other employment settings, the physician extender can expect regular hours, few weekend or evening responsibilities, opportunity for growth, and, in general, better pay.<sup>23</sup> All these factors collectively make physician extender 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 a physician extender, can provide to their medical practice<sup>21</sup> (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.<sup>1</sup> 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.<sup>20</sup> 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.

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 “*NCAA Recommendations and Guidelines for Appropriate Medical Coverage for Intercollegiate Athletics.*”<sup>63</sup> (<http://www.nata.org/sites/default/files/AMCIA-Revised-2010.pdf>) or find a link at [www.mhhe.com/prentice15e](http://www.mhhe.com/prentice15e). 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”<sup>50</sup>—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.” (See <http://www.nata.org/sites/default/files/NCAASupportofATCs.pdf> or find a link at [www.mhhe.com/prentice15e](http://www.mhhe.com/prentice15e)).

A number of athletic trainers working at colleges and universities are employed as faculty