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Athletic training education : critical thinking through case scenarios

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ATHLETIC TRAINING EDUCATION:

CRITICAL THINKING THROUGH CASE SCENARIOS

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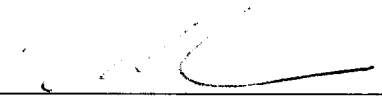

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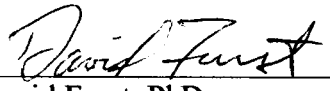

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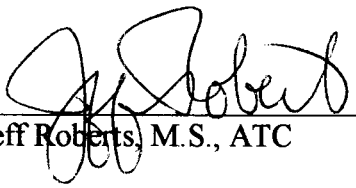

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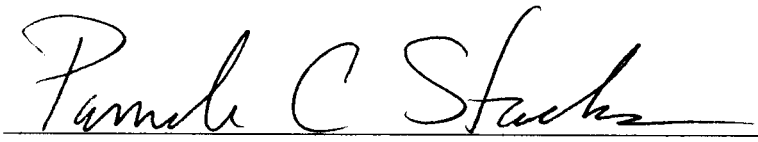

ABSTRACT

ATHLETIC TRAINING EDUCATION: CRITICAL THINKING THROUGH CASE SCENARIOS

By

Amber Noel Northam

Athletic training education programs today are accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP), and employ a competency based clinical education. Competencies have replaced the traditional clinical hour requirement, and represent the requisite knowledge base required of entry-level athletic trainers. Case studies, providing hypothetical injury situations, have been incorporated into educational programs to enhance critical thinking, incorporate competencies, and provide meaning to educational experiences learned. Presently, a manual of case studies is not available in educational materials; educators are required to create their own. This project compiled 100 injuries from the CAAHEP competency manual. One hundred athletic training case scenarios were created to mimic injury presentation and the evaluation process. The scenarios were placed on CD-ROM and will be marketed and published, thus benefiting athletic training students and educators overall educational experience.

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CHAPTER I

INTRODUCTION

Athletic training is a specialization within sports medicine and is an allied health care profession dealing with athletic injuries. The six practice domains of athletic training include: 1) prevention, 2) recognition, evaluation, and assessment, 3) immediate care, 4) treatment, rehabilitation, and reconditioning, 5) organization and administration, and 6) professional development and responsibility (NATA Education Council, May 6, 2003).

Educational requirements to become a certified athletic trainer (ATC) have changed as of January 1, 2004. Athletic training education is governed by the National Athletic Trainers Association (NATA) and has sought accreditation from the Commission on Accreditation of Allied Health Education Programs (CAAHEP). Athletic training education today is obtainable in 246 entry-level institutions (244 undergraduate and five graduate programs) which are all accredited by CAAHEP (CAAHEP, March 24, 2004). In addition to specified coursework, athletic training students (ATS) have educational competencies and clinical proficiencies to complete that demonstrate the requisite knowledge needed by an entry-level ATC. These competencies and proficiencies have replaced the traditional hour requirement in a clinical setting to standardize athletic training education. However, by eliminating the hours needed in an athletic training room, students may be given fewer opportunities to encounter injuries as they occur and to develop the skills needed to deal with an injured athlete and the subsequent evaluation process.

Studies have indicated that ATS benefit from the use of injury case scenarios where an injury is simulated for the student to critically think through the injury presentation and evaluation process (Heinrich, 2002; Mensch, 2002; Turocy, 2002). Athletic training educators have thus been encouraged to utilize case studies in their educational programs. However, the development of case studies is time consuming, and it is unrealistic to think that an athletic training educator would have enough time to create a scenario for each competency required by CAAHEP. Presently, the minimal case studies available for educators in athletic training education are scattered throughout various educational texts, manuals, or study materials. There is no organized manual available specifically for case studies.

The purpose of this project was therefore to create a set of 100 athletic training case scenarios to be used in CAAHEP athletic training education programs. One-hundred injuries were randomly chosen as a representative sample from the CAAHEP mandated competencies and proficiencies (NATA, 1999), and were compiled by studying the occurrence and the presentation of each injury. The purpose of the scenarios is to simulate injury presentation for ATS, thus affording the students an opportunity to assimilate their knowledge and critically think through the evaluation process. In addition, these case scenarios would be a benefit to athletic training educators, by minimizing time spent generating their own cases.

The scenarios encompass the evaluation, management, treatment and rehabilitation of injuries seen throughout the body, as well as other administrative and ethical situations. An instructors' guide that included appropriate responses to the

scenarios was generated as well. Upon completion, both the students' and instructors' sets of athletic training case scenarios were placed on CD-ROM. The case scenarios will be published, marketed and made available for use by accredited athletic training education programs, so that the ATS may benefit from an enhanced aspect of education.

Rationale for the Project

Athletic training education has been in a state of continual evolution since its inception in the 1950s. Starting in 2004, the only route to the National Athletic Trainers' Association Board of Certification (NATABOC) examination available to ATS is the curriculum route at an institution with a program that is accredited by CAAHEP (NATA Education Council, August 13, 2003).

The theory behind accreditation is that standardizing athletic training education programs will help facilitate promotion of the athletic training profession (Peer, 2000). Under the new accreditation standards, no specific number of clinical hours is required to take the NATABOC examination; rather clinical competencies and proficiencies that are mandated by CAAHEP need to be executed to complete the program and be eligible for the NATABOC examination (Weidner, 2002). There are approximately 2500 competencies to complete that encompass the 12 content areas for which an ATC is responsible (NATA, 1999).

Studies have demonstrated that ATS are independent learners who learn through experience and personal involvement; thus, recommendations have been made to incorporate more "hands-on activities that promote active participation" (Turocy, 2002, p. S-162). Athletic training professors have been incorporating critical thinking activities

into their education programs through case studies and research projects, to enhance their students' educational progress (Turocy, 2002). Case studies have been used in athletic training education for over 60 years to facilitate problem solving skills and decision making. Students become more active in the process and are allowed clarity of thinking through articulating ideas and decisions (Heinrichs, 2002). A study of pedagogic teaching strategies showed that both ATS and athletic training educators felt the use of case studies was beneficial because case studies made the educational process more meaningful (Mensch, 2002). Educational programs that used case studies produced students with higher motivation levels and an increased ability to assimilate athletic training knowledge (Mensch, 2002).

A set of athletic training case scenarios that incorporate injuries throughout the body will aid ATS in their educational process by mimicking those injuries that may present in the athletic training room and facilitate critical-thinking skills as suggested in the literature (Heinrichs, 2002; Mensch, 2002; Turocy, 2002). The scenarios will also benefit athletic training educators by minimizing time spent in scenario preparation, while continuing to provide meaningful education.

Delimitations

This project was delimited as follows:

1. A representative sample of 100 injuries was compiled from the CAAHEP manual for accredited athletic training education programs.

2. Seven ATCs were interviewed regarding their experiences with 10 of the 100 injuries, to gather information on injury mechanism, presentation, and management.
3. The remaining cases were generated after referencing an injury evaluation database at a local university as well as athletic training educational textbooks.

Limitations

1. The set of 100 injuries and situations encompass a random sample. This list does not cover all possible injuries to the body.
2. Athletic training case scenarios represent one way an athlete may present with an injury. However, each scenario does not reflect the only mechanism of injury. ATS need to remember that the injuries may be sustained through a variety of circumstances.

Definition of Terms

Accredited Athletic Training Education Program. A program who received the recommendation by the Joint Review Committee on Educational Programs in Athletic Training (JRC-AT) for accreditation by CAAHEP and who meet the minimum requirements to which an accredited program is held accountable (CAAHEP, May 6, 2003).

Athletic Training. A specialization within sports medicine and an allied health care profession dealing with athletic injuries. The six practice domains of athletic training include: 1) prevention, 2) recognition, evaluation, and assessment, 3) immediate care, 4)

treatment, rehabilitation, and reconditioning, 5) organization and administration, and 6) professional development and responsibility (NATA Education Council, May 6, 2003).

Athletic Training Student (ATS). Enrolled in a CAAHEP-accredited, entry-level athletic training education program (NATA Education Council, May 6, 2003)

Certified Athletic Trainer (ATC). A highly educated and skilled professional specializing in athletic health care who is an integral member of the athletic health care team; possessing at minimum a bachelor's degree, usually in athletic training, kinesiology, health, physical education or exercise science, and who have fulfilled the requirements for certification established by the NATABOC (NATA, May 6, 2003)

Clinical Proficiencies. The entry-level athletic training clinical proficiencies define the common set of requisite knowledge that entry-level athletic trainers should possess and redefine the structure of clinical education from a quantitative approach to an outcomes-based qualitative system (NATA Education Council, May 6, 2003).

Commission on Accreditation of Allied Health Education Programs (CAAHEP). A non-profit allied health education organization whose purpose is to accredit entry level allied health education programs (CAAHEP, May 6, 2003).

Education Council. A committee sponsored by the NATA to assist in the implementation of the 18 initiatives recommended by the Education Tack Force in 1997 (Weidner, 2002).

Educational Competencies. The educational content required of entry-level athletic training education programs. These competencies should be used to develop the curriculum and educational experiences of students enrolled in CAAHEP-accredited

entry-level athletic training education programs (NATA Education Council, May 6, 2003)

National Athletic Trainers' Association (NATA). A non-profit organization dedicated to improving the health and well-being of athletes and those engaged in physical activity worldwide. The Association is committed to the advancement, encouragement and improvement of the athletic training profession. The Association sets the standards for athletic trainers through its education programs (NATA, May 6, 2003).

National Athletic Trainers Association Board of Certification (NATABOC). An independent, non-profit corporation who provides a certification program for the entry-level athletic trainer and establishes requirements for maintaining status as an ATC (NATABOC, May 6, 2003).

Sports Medicine Case Scenario. A hypothetical scene that describes a specific injury or situation, and offers enough information to critically-think through the injury presentation and mechanism of injury to complete the evaluation process.

Summary

This project is a set of 100 athletic training case scenarios compiled to comply with the CAAHEP manual for accredited athletic training education programs. The purpose of the scenarios is to simulate injury presentation to ATS, thus affording the students an opportunity to assimilate their knowledge and critically think through the evaluation process. These case scenarios will be a benefit to athletic training educators by minimizing time spent generating their own cases. In addition, an instructors' guide was generated to facilitate the educational process. Upon completion, the set of athletic

training case scenarios was placed on CD-ROM. The case scenarios will be published, marketed and made available for use by accredited athletic training education programs, so that the ATS may benefit from a more meaningful aspect of education.

CHAPTER II

LITERATURE REVIEW

Athletic training education has been refined through the accreditation process by the Commission on Accreditation of Allied Health Education Programs (CAAHEP). The traditional use of clinical hours in the athletic training room has been replaced by educational competencies and proficiencies that demonstrate the knowledge and skills that an entry-level certified athletic trainer (ATC) should possess. However, competencies do not simulate the evaluation process of an injured athlete.

Studies have shown that athletic training students (ATS) benefit from the use of injury case scenarios where an injury is simulated for the student to critically think through the injury presentation and evaluation process (Heinrichs, 2002; Mensch, 2002; Turocy, 2002). Presently, there is no manual of case studies available in educational texts, manuals, or study materials for athletic training educators to use; so educators are forced to create their own injury scenarios, which is a time consuming endeavor. Therefore, the purpose of this project was to create a set of 100 athletic training case scenarios to be used in CAAHEP athletic training education programs, to promote critical thinking through the evaluation process.

This chapter contains information regarding the history of the changes in athletic training education that have culminated in today's educational practices. This chapter will be presented in seven sections including: history of the NATA, early athletic training education programs, athletic training: the major, accreditation mandate, competencies, critical thinking, and time constraints.

History of the NATA

The NATA was founded in 1950 with a purpose to "build and strengthen the profession of athletic training through the exchange of ideas, knowledge, and methods of athletic training" (Delforge, 1999, p. 53). Membership initially consisted of male athletic trainers who represented the big collegiate schools at the time. One of the goals of the NATA was to attract young men into the profession, help them find work, and advance their careers (NATA, 2000). Athletic trainers received their training in an apprenticeship fashion, in hands-on training from established athletic trainers. Two years later, the NATA was called the "fastest growing organization in the athletic field today" (NATA, 2000, p. 9) and NATA membership was opened up to athletic trainers in professional baseball, football, basketball and hockey. Six colleges reported providing athletic training majors (NATA, 2000).

The NATA formed the Committee on Gaining Recognition to oversee athletic training education program development. In 1956, the committee was charged with enhancing the professionalization of athletic training through education programs and national certification (Delforge, 1999). In the early days of the NATA, not only was the focus of the organization to support one another, the organization controlled every aspect of athletic training from setting education standards, approving education programs, establishing requirements for certification eligibility, writing the certification exam, and administering the exam (Starkey, 2002). With the NATA possessing all the control, athletic training lacked recognition from other health care fields (Starkey, 2002).

Early Athletic Training Education Programs

The first official athletic training curriculum was developed in 1959, by the Committee on Gaining Recognition, and was approved by the NATA. The curriculum stressed two areas: the attainment of a secondary-school teaching credential and curriculum courses emphasizing pre-physical therapy (Delforge, 1999). According to Delforge, the growth rate of athletic training education programs was slow; it was not for another 10 years, in 1969, that the first undergraduate athletic training education program was recognized by the NATA. In that same year, the Professional Education Committee (PEC) was formed and ultimately replaced the Committee on Gaining Recognition. The PEC recommended to the NATA full recognition of the first undergraduate athletic training education programs, and subsequently, four athletic training education programs were formed with the approval of the NATA (Delforge, 1999). In order to be recognized as an athletic training education provider, the institution had to be approved by the NATA following a site-visit by two members of the NATA-PEC; thus began NATA approval of athletic training education programs that would last until the 1990s (NATA, 2000). In the 1970s, the athletic training curriculum was amended; the teaching credential was no longer required, and a minimum number of athletic training clinical hours was mandated to be eligible for the certification examination (Delforge, 1999).

The National Athletic Trainers' Association Board of Certification (NATABOC) was formed in 1969 with the responsibility of certifying athletic trainers (NATABOC, May 6, 2003). Until 1989, the NATABOC was governed by the NATA; however, in 1989 the NATABOC sought an accrediting agency and became an independent non-

profit corporation (NATABOC). The first certification examination was offered in 1970. During the 1970s, four avenues existed to be eligible to take the NATABOC examination: completion of a NATA-approved athletic training education program, completion of an apprenticeship program, graduation from a physical therapy program, or the special consideration route (e.g. a minimum of 5 years experience as an athletic trainer) (Delforge, 1999). Thus, the first phase of athletic training education was established and led to the development of the athletic training major.

Athletic Training: the Major

In 1980, the NATA passed a resolution requiring current athletic training education programs to offer a major in athletic training. In 1983, the *Guidelines for Development and Implementation of NATA Approved Undergraduate Athletic Training Education Programs* was published, and contained two major topics (Delforge, 1999). The first was that institutions could offer an equivalent academic major. The institution's athletic training major needed to require as many semester units as the department's equivalent major in physical education. The athletic training major curriculum would focus on the specific subject matters needed by athletic trainers. The second was the inclusion of the 1981-1982 *Competencies on Athletic Training*. These competencies were based on the Performance Domains of the certified athletic trainer, as designated in the first role delineation study conducted by the NATA in 1982, and represented the beginnings of the competency-based athletic training education (Delforge). This phase helped focus athletic training education; however, the NATA was already looking towards the next phase, accreditation.

Accreditation Mandate

The NATA continued to strive toward the betterment of the profession and sought to reorganize undergraduate athletic training education; therefore, a relationship with the American Medical Association (AMA) was established (Mathies, 1995). This relationship resulted in the AMA formally recognizing athletic training as an allied health profession in June, 1990 (Delforge, 1999; Weidner, 2002). This recognition ultimately would change the scope of athletic training education.

Prior to athletic training being recognized by the AMA, professional socialization was the primary focus of clinical education (Weidner, 2002). "Socialization is a process whereby a person is accepted into a tradition and acquires the group's values and attitudes, interests, skills land knowledge" (Weidner, 2002, p.S-244). ATS would conform to their teachers' expectations and were thought to be more concerned with "looking busy" (Weidner, 2002, p. S-224), than in clinical learning. The AMA's recognition would result in the standardization of the ATS education, both in the classroom and in the clinical setting.

In 1990, the Joint Review Committee on Educational Programs in Athletic Training (JRC-AT) was formed to review allied health education programs (Delforge, 1999). The first task assigned to the committee was to develop standards and guidelines to govern JRC-AT review of accredited entry-level programs. At present, the JRC-AT is responsible for establishing accreditation standards for athletic training education programs, and makes recommendations to CAAHEP regarding accreditation actions (NATANews, August 24, 2003). Ultimately, CAAHEP oversees the operations of the

committee. The JRC-AT was formed by the NATA, but is an independent agency (Starkey, 2001).

In the 1990's, two routes existed for athletic training students to be eligible for the NATABOC examination: the internship route and the curriculum route. The internship route required 1500 clinical hours with limited coursework, while the curriculum route required 800 clinical hours with an expanded content area of study (Peer, 2000). Due to the lack of standardization from the two routes, athletic training struggled with its credibility in the allied health care world. Thus, accreditation was sought to standardize athletic training education programs and to promote quality in the profession.

In 1994, the Education Task Force was formed to review athletic training education and was asked to make recommendations regarding the future of athletic training education (Delforge, 1999). In 1997, the NATA approved 18 initiatives presented by the Education Task Force (NATA Education Task Force, 1997). Those initiatives were: 1) As of 2004, completion of a CAAHEP accredited program would be necessary to be eligible for the NATABOC certification exam, 2) The development of accredited entry-level graduate athletic training programs, 3) The development of certificates of advanced qualification (CAQ) for athletic training educators, 4) The CAAHEP Essentials and Guidelines be modified to include instruction in pharmacology and pathology, 5) The NATABOC reevaluate the minimum hour and high-risk sport requirement necessary to be eligible for the certification exam, 6) The JRC-AT research the extent to which various athletic training work settings were included in the education programs, 7) The accreditation of master's degree programs should be governed by the

JRC-AT, 8) An Education Council should be organized to replace the PEC and help oversee athletic training education, 9) The NATA should support the NATABOC's evaluation of CEU accumulation and recertification, 10) The NATA should develop a program to award CAQ's, 11) The development of multi-disciplinary education programs to coordinate athletic training with other appropriate professions such as teaching, nursing, physical therapy and occupational therapy, 12) New athletic training education programs should consider placing themselves in colleges of health-related professions, 13) Athletic training education programs should be titled "Athletic Training", 14) The Research and Education Foundation, the *Journal of Athletic Training*, and other entities should continue to reward high quality research in athletic training, 15) The NATA should aid in initiating legislative reform to standardize educational requirements for state credentialing, 16) The NATA should promote the high school environment for a full-time athletic trainer or teacher-athletic trainer, 17) The NATA should aid the JRC-AT in contracting their administrative functions with a professional management firm, and 18) Planning grants should be made available to institutions who wish to become accredited but lack sufficient funds (NATA Education Task Force, 1997).

The most important of those initiatives was the standardization of athletic training professional preparation through the elimination of the internship route as a means to certification (Weidner, 2002). Accreditation would require all athletic training education programs to follow the curriculum model and completion of an accredited program would be the requirement for eligibility for taking the NATABOC examination (Peer, 2000). At the recommendation of the NATA-JRC, CAAHEP placed a timeline on the end of the

internship model; as of January 1, 2004, the NATABOC would no longer accept internship route applications (NATA Education Council, August 13, 2003).

One study on educational experiences in athletic training programs demonstrated that students from CAAHEP-accredited programs that fostered autonomy, responsibility and confidence in the learning environment, produced students with higher motivation and value for their education (Mensch, 2001). The NATA's decision to eliminate the internship route as a means for eligibility for the NATABOC examination was supported by a study that compared GPA, the number of clinical hours completed and educational route taken. The study indicated that the number of clinical hours completed did not predict an ATS' performance on the NATABOC examination, but that the best predictor of success was overall GPA (Middlemas, 2001).

Accredited athletic training education programs were deemed necessary to standardize the profession and to better prepare the ATS for the NATABOC examination (Weidner, 2002). In an attempt to verify that each student was exposed to the same injuries during their clinical education, the use of educational competencies would replace the traditional hour requirement (Knight, 2003).

Competencies

In 1997, the NATA Education Council created a Competencies Committee which was charged with reviewing and expanding the current athletic training educational competency domains. The most recent role delineation study indicated that athletic trainers were employed in various settings and worked with distinctly different populations; thus, in order to appropriately prepare ATS for all potential work

environments, the educational competency domains would need to be expanded (Weidner, 2002). The Competencies Committee doubled the athletic training domains from six to 12. Clinical proficiencies were added into the domains as well; these synthesized cognitive, psychomotor and affective teaching objectives into clinical skills. These proficiencies were to replace clinical hours in the education process and would now be the measure of the ATS' clinical learning (Weidner, 2002).

The clinical proficiencies define two purposes: the common set of skills that entry level athletic trainers should possess, and the expectations of an outcomes-based clinical education system. The clinical proficiencies correspond with 12 major subject areas in athletic training education: 1) risk management and injury prevention, 2) pathology of injuries and illnesses, 3) assessment and evaluation, 4) acute care of injury and illness, 5) pharmacology, 6) therapeutic modalities, 7) therapeutic exercise, 8) general medical conditions and disabilities, 9) nutritional aspects of injury and illness, 10) psychosocial intervention and referral, 11) health care administration, and 12) professional development and responsibilities (NATA, 1999).

Critical Thinking

ATS have been shown to be independent learners who learn through experience and personal involvement; thus, recommendations have been made to athletic training education programs to incorporate more "hands-on" experience (Turocy, 2002). By critically thinking, students recall and comprehend knowledge learned, apply that knowledge to specific situations and make discriminating judgments and evaluations (Turocy, 2002).

Athletic training educators use case studies and research papers to promote critical thinking and enhance students' progress. Critical thinking is the essence of athletic training (Turocy, 2002). When an athlete enters the athletic training room complaining of pain or dysfunction in a certain area, the athletic trainer is forced to investigate what is happening in the athlete's body to create the signs and symptoms the athlete is experiencing. This evaluation process can be likened to working on a puzzle; the puzzle can only be solved when all its pieces are put together. With an injury, there are many components that either will affect an injury, or be affected by the injury, and it is the responsibility of the athletic trainer to find all the pieces to complete the puzzle. Therefore, the use of critical thinking in educational practice is critical to the further enhancement of future athletic training professionals (Turocy, 2002).

A study on pedagogic teaching strategies indicated that both ATS and athletic training educators felt the use of case studies was beneficial because case studies made the educational process more meaningful (Mensch, 2002). Students stated that learning was easier when injury scenarios were used and it helped prepare the student for when they would have a team of their own. Students' motivation levels also increased when they were able to integrate their athletic training content knowledge into practical application. Both students and professors expressed that the use of practical situations where the student could become involved in the decision-making process produced a better learning environment than the traditional classroom setting, and the students felt more confident. Those educational programs that utilized case studies produced students

with higher motivation levels and an increased ability to assimilate athletic training knowledge (Mensch, 2002).

Another study on problem-based learning and developing critical thinking skills reported that case studies have been used the longest to enhance critical thinking skills and foster the decision making process (Heinrichs, 2002). Over 60 years ago, students were noticed to play a more active role in the classroom when they could incorporate problem-solving skills (Heinrichs, 2002). Students learn more effectively from each other's thoughts and mistakes, and can clarify their thinking through articulation of the problem; students are enthusiastic, and their knowledge is better retained, retrieved and applied. (Heinrichs, 2002). The educational process is more enjoyable through exploration, discussion, and debate (Heinrichs, 2002). Case studies should be incorporated into athletic training programs, yet scenarios are rarely available in educational materials. When case studies are used, educators are required to create their own scenarios.

Time Constraints

In 1999, a survey was administered to the program directors of CAAHEP accredited undergraduate athletic training programs to compare the changes in job responsibilities of the program director secondary to the changes in athletic training education. The results showed that in the majority of positions, the following duties were expected: teaching, administration, committee work, student advising, professional involvement, community service, presentations, research and publications (Perkins, 2001). Program directors today work less in the clinical setting than before. A decrease

in clinical hours may have led program directors to believe there would be an increase in discretionary time, but the other requirements of the position make up for the reduction in clinical hours (Perkins, 2001).

Athletic training clinical instructors have been identified as the most critical to students' learning (Weidner, 2002). However, due to the increase in responsibilities, it may continue to be difficult to find the adequate time required to dedicate towards teaching (Weidner, 2002). Today's trends are towards increased work loads and fewer resources (Weidner, 2002). It is unrealistic to add another task of creating athletic training case scenarios to their existing list of responsibilities. Program directors' time management would be aided by the creation of a set of athletic training case scenarios to use in the educational setting.

Through the use of athletic training case scenarios, ATS would utilize critical thinking that would enhance their learning experience (Turocy, 2002). With the completion of this project, 100 scenarios would be made available to CAAHEP accredited programs for use in their educational programs. These scenarios will offer educators opportunities to incorporate critical thinking exercises into their programs without the time involved in creating the scenarios. Ultimately, the use of athletic training case scenarios will offer stronger athletic training education programs that produce ATS with higher motivation levels and an increased ability to assimilate their knowledge (Mensch, 2002).

CHAPTER III

METHODOLOGY

A set of 100 athletic training case scenarios was generated to assist in The Commission on Accreditation of Allied Health Education Programs (CAAHEP) required education process of the athletic training student (ATS). The purpose of the case scenarios is to mimic injuries that may occur in athletic training settings, thus allowing the ATS the opportunity to assimilate knowledge previously learned and experience the evaluation process for each injury through critical thinking. In addition, these case scenarios will assist athletic training educators by minimizing time spent generating their own cases scenarios.

This chapter explains the process of generating the case scenarios and the plan for their future use in four sections: compiling the injuries, scenario data collection, construction of the athletic training case scenarios, and project completion. Finally, this project will be placed on CD-ROM and marketed to accredited athletic training education programs to benefit ATS' education.

Compiling the Injuries

The CAAHEP manual for accredited athletic training programs was reviewed with special attention paid to the sections regarding competencies and proficiencies to review the specific parameters for which the ATS is held accountable (NATA, 1999) (see Appendix A). NATA permission was sought and granted to include the 1999 NATA Athletic Training Educational Competencies (see Appendix B). The body area evaluation lists were cross-referenced with Arnheim's 2000 text to generate a set of 100

athletic training case scenarios that represent injuries to the entire body (see Appendix C). Arnheim's Principles of Athletic Training was chosen from the NATABOC reference list because it is a comprehensive introductory text that has been commonly used in athletic training education since the publication of its first edition in 1963.

For purposes of providing case scenarios to the appropriate education level, the case studies were to be divided into three levels: basic, intermediate and advanced. Each level corresponds with the level of advancement in the educational program. In the basic level, the ATS complete observation hours in the athletic training room, and are enrolled in a care and prevention class and/or a beginning level athletic training class (NATA, 1999). These students are able to perform basic and emergency functions such as taping and emergency first aid. In the intermediate level, ATS are involved in clinical rotations and enrolled in athletic training evaluation classes (NATA, 1999). These students are prepared to perform evaluations on injured athletes. In the advanced level, ATS continue in clinical rotations and have taken all or almost all required classes (NATA, 1999). These students are given increased autonomy to enhance decision making skills. Each case scenario was placed into the corresponding level in accordance with the timing of the educational objective.

Scenario Data Collection

A convenience sample of seven certified athletic trainers (ATC) was chosen by the researcher to be interviewed. The sample comprised immediate access ATCs employed in the traditional setting throughout California. The chosen sample represented ATCs from different institutions, backgrounds and years of experience. Prior to

conducting interviews, approval of human subjects was granted by San Jose State University's IRB (See Appendix D). Informed consent was offered and accepted by every participant (See Appendix E).

Each ATC was interviewed regarding their previous experiences with some of the injuries that were chosen (see Appendix F). Each ATC was shown the list of injuries and asked to elaborate on 10 cases in which they had personal experience. The athletic trainer was asked how the injury occurred, how the athlete presented, how the evaluation was completed and the final assessment. Once an injury was provided a scenario, that injury was highlighted on the list offered in subsequent interviews, to prevent replication of scenarios for the same injury.

The interviews were tape recorded, and notes were taken to maintain accuracy during case study construction. After all the interviews were conducted, scenarios for the remaining injuries were generated after referring to an injury evaluation database at a local university, and through referencing athletic training textbooks for mechanism of injury and presentation of signs and symptoms. These textbooks included Hoppenfeld (1976), Arnheim (2000), Konin (2002), Magee (2002), and Starkey (2002). The books are representatives of texts used by the NATABOC and CAAHEP accredited programs (NATA Education Council, May 24, 2004).

Construction of the Sports Medicine Case Scenarios

A scenario was generated for each case detailing how an athlete would present in that specific situation, by using the presentation and mechanism of injury occurrence (see Appendix G). Pertinent questions were then asked to lead the ATS down the path of

injury evaluation, differentiation, and management. Different questions were posed in each case, due to the nature of the injury and the critical structures involved. For advanced students, more questioning followed in some cases to increase the difficulty in the management of the injury and the rehabilitation process. This offers the ATS increased exposure to the whole injury management process, with focus placed on the long term plan for the athlete as well as the evaluation process.

Project Completion

An instructor's book was generated to accompany the student's book (see Appendix H). The instructor's book includes the scenarios given in the student's book, as well as the appropriate responses, to eliminate any guesswork regarding how other ATCs handled a given situation. The athletic training case scenarios and the instructors' guide were placed on CD-ROM, to be copyrighted and marketed. The target population is accredited athletic training education programs. The NATA will be notified of this new product through the athletic training list serve and a request to host the information on the national website. The product will come with an accompanying manual to guide the educators in their usage of the product.

Summary

A sample of seven ATCs was interviewed regarding their experiences throughout their career. One-hundred athletic training case scenarios were then generated to assist the ATS by simulating all types of injuries that can happen throughout the body. These materials need to be available for use by CAAHEP accredited programs in order to benefit athletic training students. The complete set of 100 athletic training case scenarios

will be published on CD-ROM, marketed and made available for institutions to acquire, thus benefiting the ATS' overall quality of educational experience.

CHAPTER IV

RESULTS

A set of 100 athletic training case scenarios was generated to assist The Commission on Accreditation of Allied Health Education Programs (CAAHEP) required education process of the athletic training student (ATS). The purpose of the case scenarios is to mimic injuries that may occur in athletic training settings, thus allowing the ATS the opportunity to assimilate knowledge previously learned and experience the evaluation process for each injury through critical thinking. In addition, these case scenarios will assist athletic training educators by minimizing time spent generating their own scenarios. This chapter will present three sections: participant demographics, case scenario results, and case scenario reviewer demographics.

Participant Demographics

A sample of seven certified athletic trainers (ATCs) were interviewed regarding their experiences with the chosen injuries. Participants were chosen as a sample from various settings including: three universities and one high school. All chosen participants were nationally certified and regarded as knowledgeable in the field of athletic training. Prior to conducting the interviews, approval of human subjects was granted by San Jose State University's IRB, and informed consent was offered and accepted by the participants.

Three men and four women were selected. The average age of the participants was 36 years old, and ranged from 25-54 years of age. The participants average years of

NATABOC certification was 11 years and ranged 1-22 years. Figure 1 outlines each participant's demographics. ATCs 1-3 were male and ATCs 4-7 were female.

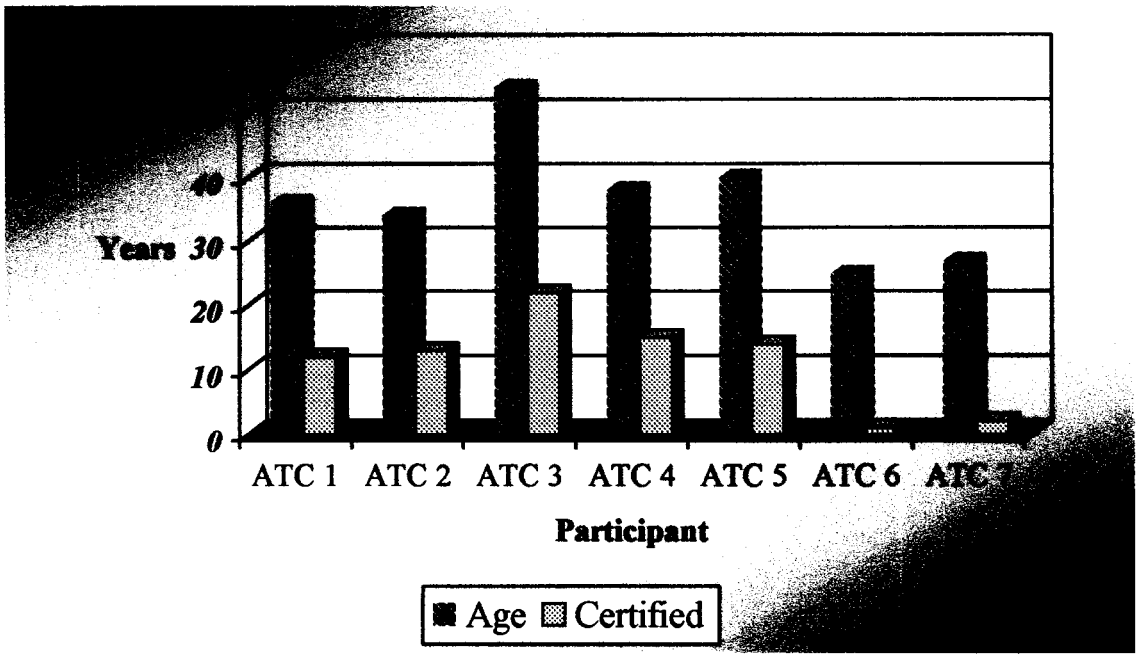

Figure 1. Participant Demographics

The present job titles of the sample include: one CAAHEP accredited athletic training education program director, one CAAHEP accredited clinical coordinator, two university head athletic trainers, one university assistant athletic trainer, one university graduate assistant athletic trainer, and one high school head athletic trainer. Previous employment for the sample included the following settings: private and public high schools, out-patient physical therapy clinics, community colleges, universities competing at the NAIA and NCAA Division I, II levels, as well as international and professional athletic teams.

Case Scenario Results

Although each participant was asked to elaborate on 10 injuries, many participants were willing to share more injuries. Therefore, repeat interviews were arranged to gather more information to create the case scenarios. The average number of cases provided by each participant was 13.

The data provided for each injury was reviewed after each interview. Some injuries required additional data to create a complete scenario. When needed, athletic training textbooks by Hoppenfeld (1976), Arnheim (2000), Konin (2002), Magee (2002), and Starkey (2002), were reviewed and appropriate information was added to the case scenario when needed. Not all cases offered in the interviews were used, depending on the amount and accuracy of the information offered by the participant.

Case Scenario Reviewer Demographics

Two case scenario reviewers were used for this project. Once completed, each case was reviewed for accuracy and applicability by each reviewer. All editorial comments were reviewed and included in each case. Both reviewers are teaching faculty in CAAHEP accredited programs, both at the undergraduate and graduate levels. The reviewers included one male and one female with an average age of 35 years and 12 years of NATABOC certification.

Summary

Seven ATCs were interviewed regarding their experiences with 100 injuries chosen from the CAAHEP manual for accredited athletic training education programs. The data provided from the interviews was used to create 100 athletic training case

scenarios. Each scenario was reviewed by two CAAHEP accredited program faculty. The purpose of the scenarios are to mimic injuries that may present in athletic training settings and allow the ATS the opportunity to assimilate knowledge previously learned and experience the evaluation process for each injury through critical thinking.

CHAPTER V

DISCUSSION

A set of 100 athletic training case scenarios was generated to assist in The Commission on Accreditation of Allied Health Education Programs (CAAHEP) required education process of the athletic training student. The purpose of the case scenarios is to mimic the injuries that may occur in the athletic training setting, thus allowing the athletic training student (ATS) the opportunity to assimilate knowledge previously learned and experience the evaluation process for each injury through critical thinking. In addition, these case scenarios will assist athletic training educators by minimizing time spent generating their own scenarios. This chapter will discuss: participant and reviewer demographics, case scenario methodology, and recommendations.

Participant and Reviewer Demographics

The sample of participants represented many years and experiences as certified athletic trainers (ATC), which lent to a broad range of diverse experiences. Participants were from different backgrounds in regards to level of education, educational institutions attended, employment positions and settings; thus resulting in a multitude of experiences to share. In addition, the participants were samples of individuals who had engaged in professional experiences both across the United States and internationally, and therefore did not encounter athletic injuries that may be considered regional. Because the sample of participants was knowledgeable, experienced, and open to sharing their experiences with others, the researcher would not choose to change the sample.

The case scenario reviewers were chosen based upon their experience and employment in a CAAHEP accredited athletic training program. Previously, each reviewer was employed in the traditional setting, meaning in an athletic training room, working with athletes in a clinical setting. Both moved on to the academic setting, educating ATS. This extensive experience with both the athletic training room setting and the academic setting lent itself well to reviewing athletic training case scenarios. The reviewers' dual backgrounds allowed them to interpret each case for its validity and applicability to the CAAHEP educational requirements.

Case Scenario Methodology

Overall, the case scenario methodology was productive in retrieving applicable case studies through the interview method. The athletic trainers interviewed were enthusiastic and were willing to provide more information than the researcher had anticipated. Each ATC had experienced some extraordinary injury that can now be shared with colleagues and students. Interviewing the ATCs regarding their experiences resulted in real, exciting, and sometimes bizarre cases that the ATS might not have the opportunity to learn about through athletic training textbooks.

In retrospect, the interviews should have been more in depth with repeated consultation an option when the case studies were lacking discrete interpretation. Often when the case studies were transcribed from the audio recordings and notes taken during the interview, a lack of information was noted. This may have been due to a lack of appropriate interview techniques, incomplete questions asked of the ATC, or a memory lapse in the participant from the length of time that had passed since the date of injury.

For example, one participant knew that an athlete had 4/5 strength, but the researcher did not know where their strength was deficient. At that point, athletic training textbooks were used to determine accurately the information that was missing. This process was time consuming, may not have been completed true to the initial case, and thus may have resulted in a loss of some of the validity associated with the case scenario. However, if the alternative to supplementing unknown information with textbook information is to never share that specific case scenario with colleagues and students, the filler information should be added.

The cases scenarios were to be divided into three groups of difficulty based upon the ATS levels of learning so that each case could be offered at an appropriate educational time. However, once the cases scenarios were constructed and an attempt was made to group the cases into the levels of learning, it was agreed upon that a new method of grouping was needed. Determining the appropriate category of beginner, intermediate and advanced level for each educational institution was difficult. Instead, the new grouping method offers each case scenario by the type of material covered in the case, so that each athletic training educator may choose cases that are appropriate for their ATS' level of learning. Therefore the new groups are: emergency care, evaluations and rehabilitation, administration and modalities.

Recommendations

The greatest aspect of this project is the sharing of ATCs' previous experiences with peers, educators and ATS. If this project or a similar project were to be repeated in the future, increasing the participant size to further expand the diversity of experiences

gathered is suggested. Larger sample sizes could allow more ordinary and extraordinary experiences to be collected, transcribed and used in the educational setting to the benefit of students.

In addition, the interviewer should be as specific as possible with the questions asked when probing into the details of injury presentation. If possible, the most thorough way to gather accurate information regarding specific injuries would be to obtain a copy of the initial injury evaluation, which was not conducted during this project due to the IRB human subject privacy concerns. The athlete's privacy must be protected, so to maintain confidentiality, their identifying information would need to be deleted and further investigation into human subjects protection performed. However, by obtaining a copy of the injury evaluation, the treating ATC could refresh his/her memory and more details could potentially be offered to the researcher.

Summary

Participants who were ATCs from different settings, with various educational and employment backgrounds, were interviewed regarding their experiences with 100 injuries chosen from the CAAHEP manual for accredited athletic training education programs. The data provided from the interviews was used to create 100 athletic training case scenarios. Each scenario was reviewed for validity and applicability by two CAAHEP accredited program faculty. The purpose of the scenarios are to mimic injuries that may present in athletic training settings and allow the ATS the opportunity to assimilate knowledge previously learned and experience the evaluation process for each injury through critical thinking.

References

Arnheim, D.D., & Prentice, W.E. (2000). *Principles of athletic training* (10th ed.). St. Louis: McGraw-Hill.

Commission on Accreditation of Allied Health Education Programs (n.d.). *About CAAHEP*. Retrieved May 6, 2003 from http://www.caahep.org/about/aboutcaahep.htm

Commission on Accreditation of Allied Health Education Programs (n.d.). *Athletic trainer programs*. Retrieved March 24, 2004 from http://www.cewl.com

Commission on Accreditation of Allied Health Education Programs (n.d.). *Standards and guidelines*. Retrieved May 6, 2003 from http://www.caahep.org/ standards/at.htm

Delforge, G.D. (1999). The history and evolution of athletic training education in the United States. *Journal of Athletic Training*, 34, 53-61.

Heinrichs, K.I. (2002). Problem-based learning in entry-level athletic training professional-education programs: A model for developing critical thinking and decision-making skills. *Journal of Athletic Training*, 37, S-189-198.

Hoppenfeld, S. (1976). *Physical examination of the spine and extremities*. Norwalk: Appleton-Century-Crofts.

Knight, K.L. (n.d.). *Clinical education: We aren't there yet, but we're making progress!* Retrieved August, 23, 2003 from http://www.cewl.com/news/att.pdf

Konin, J.G., Wiksten, D.L., Isear, J.A., Jr., & Brader, H. (2002). *Special tests for orthopedic examination* (2nd ed.). Thorofare: Slack.

Magee, D.J. (2002). *Orthopedic physical assessment* (4th ed.). Philadelphia: Saunders.

Mathies, A.L., Denegar, C.R., & Arnhold, R.W. (1995). Changes in athletic training education as a result of changing from NATA-PEC to CAAHEP. *Journal of Athletic Training*, 30, 129-132.

Mensch, J.M. (2001). Students' educational experiences in CAAHEP-accredited athletic training programs. *Journal of Athletic Training*, 36, S-45.

Mensch, J.M., & Ennis, C.D. (2002). Pedagogic strategies perceived to enhance student learning in athletic training education. *Journal of Athletic Training*, 37, S-199-207.

Middlemas, D. A., Manning, J.M., Gazzillot, L.M., & Young, J. (2001). Predicting performance on the National Athletic Trainer's Association Board of Certification examination from grade point average and number of clinical hours. *Journal of Athletic Training*, 36, 136-140.

National Athletic Trainers Association, (n.d.). *About the NATA*. Retrieved May 6, 2003 from http://www.nata.org/about/

National Athletic Trainers Association, (2000). *The history of athletic training.* Unpublished manuscript.

National Athletic Trainers Association (1999). *Athletic Training Educational Competencies*. Dallas: NATA.

National Athletic Trainers Association Board of Certification (n.d.). *About the BOC.* Retrieved May 6, 2003 from http://www.nataboc.org/atc/boc/about/

National Athletic Trainers Association Education Council (n.d.). *Clinical education definitions*. Retrieved May 6, 2003 from http://www.cewl.com/

National Athletic Trainers Association Education Council (n.d.) *Common references used in the development of the NATABOC examinations.* Retrieved May 24, 2004 from http://www.cewl.com/service/bocref.html

National Athletic Trainers Association Education Council (n.d.). *Implementation Timeline.* Retrieved August 13, 2003 from http://www.cewl.com/ec/timeline_1.html

National Athletic Trainers Association Education Task Force (1997). Recommendations to reform athletic training education. *NATA News*, February, 1997, 16-24.

National Athletic Trainers Association JRC-AT (2002). Organizational Structure of the NATABOC and JRC-AT. *NATA News*, July, 13. Retrieved August 24, 2003 from http://www.cewl.com/news/jul-02-b.pdf

Peer, K.S., & Rakich, J.S. (2000). Accreditation and continuous quality improvement in athletic training education. *Journal of Athletic Training*, 35, 1888-193.

Perkins, S.A., & Judd, M.R. (2001). Dilemmas of program directors: then and now. *Journal of Athletic Training*, 36, 396-400.

Starkey, C. (2002). Hey! Where's my cheese? *Journal of Athletic Training*, 37, 237-238.

Starkey, C. (2001). The athletic training triad: NATA, JRC-AT and NATABOC. *NATA News*, July, 2001, 46.

Starkey, C., & Ryan, J.L. (2002). *Evaluation of orthopedic and athletic injuries.* Philadelphia: F.A. Davis.

The certified athletic trainer. Retrieved May 6, 2003 from http://www.nata.org/publications/brochures/thecertifiedatc.htm

Turocy, P.S. (2002). Overview of athletic training education research publications. *Journal of Athletic Training*, 37, S-162-167.

Weidner, T.G., & Henning, J.M. (2002). Historical perspective of athletic training clinical education. *Journal of Athletic Training*, 37, S-222-228.

APPENDIX A

Athletic Training Educational Competencies

Athletic Training Educational Competencies

Third Edition

National Athletic Trainers' Association

1999

Risk Management and Injury Prevention

This content area is a collection of knowledge, skills, and values that the entry-level certified athletic trainer must possess to identify injury and illness risk factors that may be encountered by athletes and others involved in physical activity and to plan and implement a risk management and prevention program.

Cognitive Domain

1. Identifies the physical and environmental risk factors associated with specific activities the physically active person may engage in.

2. Appraises the risk factors associated with common congenital and acquired abnormalities, disabilities, and diseases.

3. Implements the recommended or required components of a pre-participation examination based on governing authorities' rules, guidelines, and recommendations.

4. Outlines the basic concepts and practice of wellness screening. This includes, but is not limited to, various baselines and standards and other fundamental methods used to screen for wellness.

5. Identifies areas that athletic personnel or supervisors must be familiar with in order to avoid or reduce the possibility of injury or illness occurring to athletes and others engaged in physical activity (e.g., CPR and first aid).

6. Describes the principles of effective heat loss and heat illness prevention programs. These principles include, but are not limited to knowledge of the body's thermoregulatory mechanisms for acclimation and conditioning, fluid and electrolyte replacement requirements, proper practice and competition attire, and weight loss.

7. Evaluates the accepted guidelines, recommendations, and policy and position statements of applicable governing agencies relating to practice during extreme weather conditions (e.g., heat, cold, and lightning).

8. Describes the use of a sling psychrometer, and possesses the ability to apply wet bulb globe thermometer (WBGT) reading and other heat and humidity indices to determine the scheduling, type, and duration of practice.

9. Defines the use of standard tests, test equipment, and testing protocol for the measurement of cardiovascular respiratory fitness, body composition, posture, flexibility or muscular strength, power, and endurance.

10. Describes the body's anatomical and physiological adaptation to cardiovascular and muscular conditioning programs.

11. Identifies the components of a physical conditioning program (pre-season, in-season, post-season, off-season).

12. Compares and contrasts the use of various types of flexibility and stretching programs, considering the results athletes and others involved in physical activity would expect if they followed a recommended routine.

13. Compares and contrasts the use of various types of strength training and cardiovascular conditioning programs, considering the effects that athletes and others involved in physical activity would expect if they followed a recommended routine.

14. Lists the safety precautions, hazards, and contraindications of various stretching, strengthening, or flexibility routines and/or equipment.

15. Identifies the precautions and risks associated with exercise in adolescents.

16. Identifies the precautions and risks associated with exercise in individuals who have systemic medical conditions.

17. Describes the components of an educational program for self-identification of the warning signs of cancer, including self-examination of the breasts and testicles.

18. Describes the basic principles regarding protective equipment, including standards for design, construction, maintenance, and reconditioning of protective sports equipment (e.g., football, hockey, and lacrosse pads and headgear).

19. Identifies basic legal concepts and considerations associated with protective equipment, including product and personal liability.

20. Accesses and interprets the rules and regulations established by the associations that govern the use of protective equipment.

21. Describes the principles and concepts relating to prophylactic taping, wrapping, and bracing and protective pad fabrication.

22. Explains the basic principles and concepts of protective equipment and material composition (e.g., tensile strength, maximum tolerances, heat dissipation).

23. Relates the principles and concepts involved in the fabrication and appropriate application of dynamic and static splints.

24. Describes the basic principles and concepts of orthotic fabrication. This includes, but is not limited to, evaluating the need for orthotics, selecting the appropriate manufacturing material, manufacturing the orthosis, and fitting the orthosis.

25. Identifies the basic principles and concepts of home, school, and work place ergonomics and their relationship to the prevention of illness and injury.

Psychomotor Domain

1. Performs appropriate tests and examinations for pre-participation physical exam as required by the appropriate governing agency and/or physician.

2. Administers static and dynamic postural evaluation procedures, including tests for muscle shortening.

3. Implements appropriate screening procedures to identify common acquired or congenital risk factors that would predispose athletes and others engaged in physical activity to certain types of injuries.

4. Collects and interprets climatic data (temperature, humidity, distance of lightning from practice or competition areas) with use of appropriate instruments or personal observation and applies this data to schedule physical activity.

5. Implements prevention and treatment of environmental stress factors that pertain to acclimation and conditioning, fluid and electrolyte replacements, proper practice and competition attire, and weight loss.

6. Uses commercial fitness equipment to administer standard physical fitness tests and records and interprets the test results.

7. Able to operate contemporary isometric, isotonic, and isokinetic strength testing devices.

8. Selects, fabricates, and applies appropriate preventive taping and wrappings, splints, braces, and other special protective devices that are consistent with sound anatomical and biomechanical principles.

9. Selects and fits standard protective equipment and clothing according to the physical characteristics and need of the individual.

10. Provides supervision and instruction to an individual in the use of commercial weight training equipment.

11. Implements and administers fitness programs, including correction or modification

of inappropriate, unsafe, or dangerous fitness routines.

12. Constructs and applies functional splints.

Affective Domain

1. Accepts the moral, professional, and legal responsibilities to conduct safe programs to minimize injury and illness risk factors for individuals involved in physical activity.

2. Acknowledges the importance of-developing and implementing a thorough, comprehensive injury and illness prevention program.

3. Understands the need for cooperation among administrators, athletic personnel, certified athletic trainers, parents/guardians, other health care professionals, and athletes and others engaged in physical activity in the implementation of effective injury and illness prevention programs.

4. Appreciates and respects the role of athletic personnel and supervisors in injury and illness prevention programs.

5. Accepts moral, professional, and legal responsibility of conducting appropriate pre-participation examinations.

6. Accepts and respects the established guidelines for scheduling physical activity to prevent exposure to unsafe environmental conditions.

7. Appreciates the importance of the body's thermoregulatory mechanisms for acclimation and conditioning, fluid and electrolyte replacements, proper practice and competition attire, and weight loss.

8. Values the importance of collecting data on temperature, humidity, and other environmental conditions that can affect the human body when exercising in adverse weather conditions.

9. Appreciates and respects the concepts and theories pertaining to strength, flexibility, and endurance programs or routines.

10. Understands the values and benefits of correctly selecting and using prophylactic taping and wrapping or prophylactic padding.

11. Appreciates and respects the importance of correct and appropriate fitting in the use of protective equipment.

12. Appreciates and respects the principles and concepts of home, school, and work place ergonomics.

Risk Management and Injury Prevention
Athletic Training Clinical Proficiencies

Teaching Objective 1:

The student will perform anthropometric measurement techniques and other appropriate examination and screening procedures.

Specific Outcomes

1. The student will assess the following:
    a) height
    b) weight
    c) blood pressure
    d) pulse
    e) limb girth
    f) limb length
    g) vision using a Snellen eye chart
    h) body composition, using a manual skinfold caliper and appropriate formulas

Teaching Objective 2:

The student will perform fitness tests and record and interpret the data using accepted procedures and equipment.

Specific Outcome

1. The student will demonstrate the ability to perform and evaluate the results of the following tests:

    a) flexibility tests
    b) strength (repetition) testing
    c) agility tests
    d) speed tests

Teaching Objective 3:

The student will demonstrate the ability to 1) obtain and interpret environmental data, 2) recognize potential hazardous conditions and situations in the activity setting, and 3) make the appropriate recommendations for activity.

Specific Outcomes

1. The student will

    a) use a sling psychrometer
    b) use a wet bulb globe index
    c) interpret and present environmental data for the following conditions: heat; wind; humidity; potential for lightning strike; cold; poor air quality
    d) check an activity setting for physical and/or environmental hazards
    e) use and interpret weight charts

Teaching Objective 4:

The student will demonstrate the ability to select and fit standard protective equipment that provides safe and healthy participation in physical activity.

Specific Outcomes

1. The student will select and fit the following protective equipment:

    a) protective helmet and head gear
    b) protective shoulder pads
    c) footwear for physical activity
    d) mouth guard
    e) rib brace/guard
    f) prophylactic ankle brace
    g) prophylactic knee brace

Teaching Objective 5:

The student will operate and instruct the use of isometric, isotonic, and isokinetic weight training equipment.

Specific Outcomes

1. The student will demonstrate the ability to establish repetition maximum tests.

2. The student will demonstrate the ability to perform an isokinetic test for the knee and shoulder.

3. The student will demonstrate the ability to interpret data obtained from isokinetic testing and to use this information to determine appropriate follow-up care.

4. The student will perform isometric tests for the following parts of the body:
    a) ankle
    b) foot/toes
    c) knee
    d) hip
    e) trunk/torso
    f) shoulder
    g) elbow
    h) wrist
    i) hand/fingers

5. The student will perform the following tests:
    a) upper body strength test
    b) lower body strength test
    c) upper body power test
    d) upper body muscular endurance test
    e) lower body muscular endurance test

Teaching Objective 6:

The student will instruct and demonstrate for the client specific flexibility exercises and activities.

Specific Outcome

1. The student will select range-of-motion exercises and activities for all major muscle groups and their associated joints and instruct a client to perform these exercises. The exercises must include the following body regions and joints:
    a) cervical region
    b) shoulder: joint and girdle
    c) elbow
    d) wrist
    e) hand and fingers
    f) lumbar region
    g) hip and pelvis
    h) knee
    i) leg
    j) ankle
    k) foot and toes

Teaching Objective 7:

The student will demonstrate the ability to instruct and establish a safe environment for the use of strength and conditioning equipment.

Specific Outcomes

1. The student will demonstrate the proper lifting technique for the following exercises:
    a) parallel squat
    b) heel raises
    c) power clean
    d) bench press
    e) shoulder press
    f) arm curl
    g) triceps extension
    h) knee curl (flexion
    i) knee extension
    j) leg press

2. The student will demonstrate the proper spotting technique for the following exercises:
    a) parallel squat
    b) shoulder press
    c) dead lift
    d) bench press
    e) power clean

Teaching Objective 8:

The student will demonstrate the ability to construct custom protective devices. These devices include, but are not limited to, those that protect contusions, sprains, strains, wounds, and fractures from further injury.

Specific Outcomes

1. The student will construct, apply, and remove the following protective devices:
    a) bony prominence pad
    b) muscle contusion pad
    c) soft playing cast (e.g., silicone, thermofoam)
    d) hard, immobilization splint or cast (e.g., thermoplastic, plaster, fiberglass)
    e) friction pad ("doughnut" pad)
    f) checkrein device

Teaching Objective 9:

The student will demonstrate the ability to select and apply preventative and protective taping, wrapping, splinting, bracing, and rehabilitative devices in order to prevent further injury.

Specific Outcomes

1. The student will demonstrate the ability to tape, splint, wrap, pad or brace the following joints to limit motions:

    a) cervical spine
    b) shoulder joint and girdle
    c) elbow
    d) wrist
    e) hand and fingers
    f) lumbar spine
    g) hip and pelvis
    h) knee
    i) leg
    j) ankle
    k) foot and toes

Pathology of Injuries and Illnesses

This content area is a collection of knowledge and values that the entry-level certified athletic trainer must possess to understand the physiological responses of human growth and development and the progression of injuries, illnesses, and diseases.

Cognitive Domain

1. Describes the essential components of a typical human cell and their functions.

2. Describes the principle functions of the cerebral cortex, basal ganglia, pons, medulla oblongata, cerebellum, spinal cord, and the peripheral nervous system.

3. Describes and explains cell adaptations (e.g., atrophy, hypertrophy, hyperplasia, metaplasia, and dysplasia).

4. Describes the morphology and function of the principle cells of the nervous system (e.g., neurons, astroglia, oligodendroglia, microglia, and ependymal cells).

5. Describes the distribution of fluid between intracellular and extracellular compartments and the process of normal circulation.

6. Analyzes the normal physiological responses of the human body to trauma and inactivity of specific body tissues (ligaments/capsules, muscles, tendons, and bones).

7. Predicts the body's adaptation to exercise during and following illness and injury.

8. Describes the aging process as it relates to athletes and others involved in physical activity.

9. Describes the integration and coordination of cell function in response to injury (e.g., sources of cell injury, inflammation, healing, and repair).

10. Describes cellular homeostasis and the integration and coordination of cell function in response to disease.

11. Defines the inflammatory response to acute and chronic injury and illness.

12. Defines tissue lesions by body system in terms of etiology, pathogenesis, pathomechanics, treatment options, and expected outcomes.

13. Outlines the autoimmune and immunodeficiency responses and their associated diseases (e.g.,lupus, HIV/AIDS).

14. Analyzes the physiologic responses of diseases to physical activity and inactivity.

15. Describes the pathology of diseases of the blood (e.g., anemia, iron deficiency, hemolysis) that would impair strenuous physical activity.

16. Recognizes the common warning signs and symptoms of cancer.

17. Describes the healing process of bone.

18. Describes the signs and symptoms of deep and superficial vein thromboses, pulmonary embolism and other emboli, and myocardial infarction.

19. Identifies the implications of various underlying pathologies and uses this knowledge to select appropriate therapeutic modalities and therapeutic exercise protocols.

Affective Domain

1. Appreciates that an understanding of pathology is essential to care for athletes and others involved in physical activity.

2. Recognizes that physician consultation is a moral and ethical necessity in the diagnosis and treatment of pathologic conditions.

3. Accepts the moral and ethical responsibility of maintaining current knowledge of the pathologic conditions of athletes and others involved in physical activity.

4. Promotes accountability for moral and ethical decision-making in the treatment of pathologic conditions.

5. Understands how the use of exercise will improve the non-diseased organ system, thus enhancing overall wellness.

Assessment and Evaluation

This content area is a collection of the knowledge, skills, and values that the entry-level certified athletic trainer must possess to assess the injuries and illnesses of athletes and others involved in physical activity and to determine proper care, referring the client to other health care providers when appropriate.

Cognitive Domain

1. Demonstrates knowledge of the normal anatomical structures of the human body systems and their physiological functions, including the musculoskeletal (including articulations), nervous (central and peripheral), cardiovascular, respiratory, digestive, urogenital, endocrine, dermatological, reproductive, and special sensory systems.

2. Distinguishes the anatomical and physiological growth and development characteristics of athletic and physically active males and females in the following stages: preadolescent; adolescent; adult; and senior.

3. Describes the physiological and psychological effects of physical activity and their impact on the performance of athletes and individuals involved in other forms of physical activity.

4. Lists and defines directional terms and cardinal planes used to describe the body and the relationship of its parts.

5. Defines the principles and concepts of body movement including functional classification of joints, joint biomechanics, normal ranges of joint motion, joint action terminology, muscular structures responsible for joint actions (prime movers, synergists), skeletal muscle contraction, and kinesthesis/proprioception.

6. Differentiates injury recognition, assessment, and diagnosis.

7. Describes commonly accepted techniques and procedures for evaluation of the common injuries and illnesses that are incurred by athletes and others involved in physical activity. These techniques and procedures include the following:

    a) taking a history
    b) inspection or observation
    c) palpation
    d) functional testing (range of motion, ligamentous or capsular stress, manual muscle, sensory, motor, reflex neurological)
    e) special evaluation techniques (e.g., orthopedic tests, auscultation, percussion)

8. Explains the relationship of injury assessment to the systematic observation of the person as a whole.

9. Demonstrates knowledge of a systematic process that uses the medical or nursing model to obtain a history of an injury or illness that includes, but is not limited to, the mechanism of injury, chief complaint, and previous relevant injuries or illnesses.

10. Explains how to take measurements of the neurological function of cranial nerves, spinal nerves, and peripheral nerves, and describes their relationships in a neurological examination.

11. Describes the use of myotomes, dermatomes, and reflexes (deep tendon, superficial) including manual muscle-testing, range-of-motion testing, and distinguishes between primary, cortical, and discriminatory forms of sensation.

12. Defines the measurement and grading of dermatomes, myotomes, and reflexes and their relationships in a neurological examination.

13. Describes active, passive, and resisted range-of-motion testing and differentiates the significance of the findings of each test.

14. Explains the role of special tests, testing joint play, and postural examination in injury assessment.

15. Explains how to measure resistive range of motion (or strength) of major muscles using manual muscle testing or break tests.

16. Differentiates the use of diagnostic tests (x-rays, arthrograms, MRI, CAT scan, bone scan, ultrasound, myelogram) based on their applicability in the assessment of an injury or illness when prescribed by a physician.

17. Explains the distinction between body weight and body composition.

18. Describes the use of basic somatotyping to quantify objective physical characteristics.

19. Explains how to recognize and evaluate athletes and others involved in physical activity who demonstrate clinical signs and symptoms of environmental stress.

20. Describes the etiological factors, signs, symptoms, and management procedures for injuries of the toes, foot, ankle, lower leg, knee, thigh, hip, pelvis, shoulder, upper arm, elbow, forearm, wrist, hand, thumb, fingers, spine, thorax, abdomen, head, and face.

21. Explains how to identify and evaluate various postural deformities.

22. Describes the location and function of the urinary, digestive, reproductive, and lymphatic systems.

23. Describes the signs and symptoms of injuries to the abdominal viscera.

24. Demonstrates familiarity with the function of an ophthalmoscope in the examination of the eye.

25. Demonstrates familiarity with the function of a stethoscope in the examination of the heart, lungs, and bowel.

26. Uses the terminology necessary to communicate the results of an athletic training assessment to physicians and other health professionals.

27. Describes components of medical documentation (e.g., subjective, objective, assessment, plan [SOAP] and history, inspection, palpation, special tests [HIPS]).

Psychomotor Domain

1. Constructs and phrases appropriate questions to obtain a medical history of an injured or ill individual that includes a previous history and a history of the present injury or illness.

2. Visually identifies clinical signs associated with common injuries and illnesses, such as the integrity of the skin and mucous membranes, structural deformities, edema, and discoloration.

3. Demonstrates active, passive, and resisted range-of-motion testing of the toes, foot, ankle, knee, hip, shoulder, elbow, wrist, hand, thumb, fingers, and spine.

4. Measures active and passive joint range of motion with a goniometer.

5. Performs appropriate manual muscle-testing techniques and/or break tests, including application of the principles of muscle/muscle group isolation, segmental stabilization resistance/ pressure, and grading, to evaluate injuries incurred by athletes and others engaged in physical activity.

6. Administers static and dynamic postural evaluation and screening procedures, including functional tests for postural deformities and muscle length assessment.

7. Applies appropriate stress tests for ligamentous or capsular instability based on the principles of joint positioning, segmental stabilization, and force.

8. Measures the grade of ligamentous laxity during a joint stress test and notes the quality and quantity of the end point.

9. Applies appropriate and commonly used special tests to evaluate athletic injuries to various anatomical areas."

10. Demonstrates the proper use of the otoscope for ear and nasal examination, including the proper positioning of the patient and examiner and proper technique of use.

11. Conducts auscultation of normal heart, breath, and bowel sounds, demonstrating proper position and location of stethoscope.

12. Palpates bony and soft tissue structures to determine normal or pathological tissue(s).

13. Performs and interprets appropriate palpation techniques and special tests of the abdomen, chest, cranium, and musculoskeletal system.

14. Assesses the neurological function of cranial nerves, spinal nerves, and peripheral nerves and assesses the level of spinal cord involvement following injury, including the function of dermatomes, myotomes, and reflexes (e.g., deep tendon, superficial).

15. Performs appropriate examination of injuries to the trunk and upper and lower extremities prior to an individual's return to activity.

16. Performs an appropriate examination to evaluate the return to activity of an individual who has sustained a head injury.

17. Uses appropriate terminology in the communication and documentation of injuries and illnesses.

Affective Domain

1. Appreciates the importance of a systematic assessment process in the management of injuries and illness.

2. Appreciates the importance of documentation of assessment findings and results.

3. Accepts the role of the certified athletic trainer as a primary provider of assessment to the injuries and illnesses of athletes and others involved in physical activity.

4. Recognizes the initial clinical evaluation by the certified athletic 'trainer as an assessment and screening procedure, rather than as a diagnostic procedure.

5. Appreciates the practical importance of thoroughness in a clinical evaluation.

6. Accepts the professional, ethical, and legal parameters that define the proper role of the certified athletic trainer in the evaluation and appropriate medical referral of injuries and illnesses of athletes and others involved in physical activity.

7. Values the skills and knowledge necessary to competently assess the injuries and illnesses of athletes and others involved in physical activity.

Assessment and Evaluation
Athletic Training Clinical Proficiencies

Teaching Objective 1:

The student will conduct static and postural evaluation and screening procedures.

Specific Outcomes

1. The student will recognize the following postural deviations and predisposing conditions:

    a) kyphosis
    b) lordosis
    c) scoliosis
    d) pelvic obliquity
    e) tibial torsion
    f) hip anteversion and retroversion
    g) genu valgum, varum, and recurvatum
    h) rearfoot valgus and varus
    i) forefoot valgus and varus
    j) pes cavus and planus
    k) foot and toe posture

2. The student will perform a postural assessment of the following:

    a) cervical spine and head
    b) shoulder
    c) lumbo-thoracic region
    d) hip and pelvis
    e) knee
    f) ankle, foot, and toes

3. The student will identify and classify body types as:

    a) endomorph
    b) ectomorph
    c) mesomorph

Teaching Objective 2:

The student will perform record keeping skills while maintaining patient confidentiality.

Specific Outcomes

1. The student will

    a) use standardized record keeping methods (e.g., SOAP, HIPS)
    b) select and use injury, rehabilitation, referral, and insurance documentation
    c) use progress notes

Injury Evaluation and Physical Examination Skills

Teaching Objective 3:

The student will demonstrate the ability to palpate anatomical structures.

Specific Outcomes

1. The student will identify and palpate the following:

    a) bony landmarks of the head, trunk, spine, scapula, and extremities
    b) soft tissue structures of the head, trunk, spine, and extremities
    c) abdominal and thoracic structures
    d) primary neurological and circulatory structures

Teaching Objective 4:

The student will assess neurological responses.

Specific Outcomes

1. The student will identify and assess the following:

    a) cranial nerves
    b) dermatomes
    c) myotomes
    d) deep tendon reflexes
    e) pathological reflexes

Teaching Objective 5:

The student will perform proper clinical evaluation techniques, including range-of-motion testing (active, passive, assisted).

Specific Outcomes

1. The student will qualitatively assess active, passive, resistive range of motion for the following:

    a) temporomandibular joint
    b) cervical spine
    c) shoulder
    d) elbow
    e) wrist and hand
    f) thumb and fingers
    g) hip
    h) lumbar spine
    i) thoracic spine
    j) knee
    k) ankle
    l) foot and toes

Teaching Objective 6:

The student will perform clinical evaluations of major body areas to assess and interpret for injury and illness.

Head and Face Evaluation

The student will

1. obtain the medical history of an ill or injured athlete or other physically active individual.

2. observe and identify the clinical signs and symptoms associated with head injury:

    a) amnesia (retrograde or post-traumatic)
    b) levels of consciousness
    c) orientation (person, time, place orientation)
    d) intracranial hematoma
    e) balance and coordination
    f) pupil and eye movements
    g) pulse
    h) blood pressure
    i) fascial postures

3. observe and identify the clinical signs and symptoms associated with eye injuries and

illnesses:

a) orbital blowout fracture
b) conjunctivitis
c) corneal abrasion
d) corneal laceration
e) detached retina
f) hyphema
g) stye

4. observe and identify the clinical signs and symptoms associated with an ear injury or illness:

a) pinna hematoma ("cauliflower ear")
b) impacted cerumen
c) otitis externa
d) otitis media

5. observe and identify the clinical signs and symptoms associated with nose injury:

a) deviated septum
b) epistaxis
c) nasal fracture

6. observe and identify the clinical signs and symptoms associated with jaw, mouth, or tooth injury or illness:

a) gingivitis
b) mandibular fracture
c) maxilla fracture
d) periodontitis
e) temporomandibular joint dislocation
f) temporomandibular joint dysfunction
g) tooth abscess
h) tooth extrusion
i) tooth fracture
j) tooth intrusion
k) tooth luxation

7. administer appropriate sensory, neurological, and circulatory tests

8. administer functional tests and activity-specific tests

9. identify, palpate, and assess the integrity of bony landmarks

10. identify, palpate, and assess the integrity of soft tissue

11. administer commonly used special tests to make a differential assessment of the following:

    a) cranial nerves (e.g., eye motion, facial muscles)
    b) cognitive tests (e.g., recall, serial 7s, digit span)
    c) cerebellar function (e.g., Romberg's test, finger-to-nose test, heel-toe walking, heel-to-knee standing)
    d) spinal nerve roots (e.g., upper quarter screen

Cervical Spine Evaluation

The student will

1. obtain the medical history of an ill or injured athlete or other physically active individual

2. observe and identify the clinical signs and symptoms associated with common injuries, illnesses, and predisposing conditions:

    a) atrophy
    b) dislocation or subluxation
    c) vertebral fracture
    d) head and neck posture
    e) intervertebral disc herniation
    f) nerve root compression or stretch
    g) ischemia
    h) torticollis

3. administer active and passive range-of-motion tests using quantifiable techniques (e.g., tape measure, goniometer, and inclinometer)

4. use manual muscle-testing techniques

5. administer appropriate sensory, circulatory, and neurological tests

6. administer functional tests and activity-specific tests

7. identify, palpate, and assess the integrity of bony landmarks

8. identify, palpate, and assess the integrity of soft tissue

9. administer commonly used special tests to make a differential assessment of the

following:

a) nerve root compression (e.g., distraction/compression test, Spurling's test, shoulder depression test)
b) brachial plexus neuropathy (e.g., brachial tension test, Tinel's sign)
c) cervical disc herniation (e.g., Valsalva's maneuver)
d) neurovascular dysfunction (e.g., vertebral artery test)

Shoulder Evaluation

The student will

1. obtain the medical history of an ill or injured athlete or other physically active individual

2. observe and identify the clinical signs and symptoms associated with common injuries, illnesses, and predisposing conditions:

   a) atrophy
   b) bursitis
   c) dislocation or subluxation
   d) efficiency of movement
   e) fracture
   f) sprain
   g) nerve injury
   h) positioning (Sprengel's deformity)
   i) strain
   j) scapulohumeral rhythm
   k) scapular winging
   l) step deformity
   m) symmetry
   n) tenosynovitis and tendonitis

3. administer active and passive range-of-motion tests using standard goniometric techniques

4. use manual muscle-testing techniques

5. administer appropriate sensory, neurological, and circulatory tests

6. administer functional tests and activity-specific tests

7. identify and palpate bony landmarks

8. identify and palpate soft tissue landmarks

9. administer commonly used special tests to make a differential assessment of the following:

    a) glenohumeral instability (e.g., anterior drawer test, posterior drawer test, relocation test, apprehension test, clunk test, sulcus sign)
    b) acromioclavicular instability (e.g., shear test, compression test)
    c) rotator cuff impingement/inflammation (e.g., Speed's test, drop arm test, empty can test, impingement test, Hawkins-Kennedy impingement test, Neer impingement test, pectoralis major contracture test)
    d) biceps and biceps tendon pathology (e.g., Yergason's test, Ludington's test)
    e) thoracic outlet syndrome (e.g., Adson'smaneuver, Allen test, military brace position)

Elbow Evaluation

1. The student will obtain the medical history of an ill or injured athlete or other physically active individual

2. observe and identify the clinical signs and symptoms associated with common injuries, illnesses, and predisposing conditions:

    a) symmetry
    b) carrying angle (cubital valgus and varus)
    c) dislocation or subluxation
    d) fracture
    e) atrophy
    f) efficiency of movement
    g) bursitis
    h) epicondylitis
    i) tenosynovitis and tendonitis
    j) osteochondritis dissecans
    k) sprain
    l) strain
    m) nerve injury

3. administer active and passive range-of-motion tests using standard goniometric techniques

4. use manual muscle-testing techniques

5. administer appropriate sensory, neurological, and circulatory tests
6. administer functional tests and activity-specific tests

7. identify, palpate, and interpret the integrity of bony landmarks

8. identify, palpate, and interpret the integrity of soft tissue

9. administer commonly used special tests to make a differential assessment of the following

    a) joint instability (e.g., valgus stress test, varus stress test)
    b) inflammatory conditions (e.g., tests for lateral epicondylitis, tests for medial epicondylitis)
    c) neuropathy (e.g., Tinel's sign, pronator teres syndrome, pinch grip test)

Forearm, Wrist, and Hand Evaluation

The student will

1. obtain the medical history of an ill or injured athlete or other physically active individual

2. observe and identify the clinical signs and symptoms associated with the following

    a) fracture (Colles' fracture, Bennett's fracture, carpal fracture ["boxer's fracture"], metacarpal fracture, phalanges fracture)
    b) dislocation or subluxation
    c) disease states (e.g., clubbed nails, spoon-shaped nails)
    d) soft tissue pathology (e.g., sprain, flexor tendon avulsion [jersey finger sign], extensor tendon avulsion [mallet finger], extensor tendon rupture [boutonniere deformity], volar plate rupture [pseudo-boutonniere deformity], Dupuytren's contracture, ganglion, swan neck deformity, trigger finger)
    e) neurovascular involvement (e.g., carpal tunnel syndrome, bishop's or benediction deformity, ape hand, claw fingers, drop-wrist deformity, Volkmann's contracture)

3. administer active and passive range-of-motion tests using standard goniometric techniques

4. use manual muscle-testing techniques

5. administer appropriate sensory, neurological, and circulatory tests

6. administer functional tests and activity-specific tests

7. identify, palpate, and interpret the integrity of bony landmarks

8. identify, palpate, and interpret the integrity of soft tissue

9. administer commonly used special tests to make a differential assessment of the following:

    a) inflammatory conditions (e.g., Finkelstein test)
    b) joint instability (e.g., valgus stress test, varus stress test, glide tests)
    c) neurovascular pathology (e.g., Tinel's sign, Phalen's test)

Thoracic/Lumbar Spine Evaluation

The student will

1. obtain the medical history of an ill or injured athlete or other physically active individual

2. observe and identify the clinical signs and symptoms associated with common injuries, illnesses, and predisposing conditions:

    a) cafe au lait macules (spots)
    b) dislocation or subluxation
    c) spina bifida occulta
    d) facet syndrome
    e) interv6iebral disc pathology
    f) spinal posture (kyphosis/ lordosis)
    g) leg length discrepancies
    h) nerve root compression
    i) sacroiliac dysfunction
    j) scoliosis
    k) vertebral pathology (e.g., spondylitis, spondylolysis, spondylolisthesis)
    l) sprain
    m) stenosis
    n) step deformity
    o) strain

3. administer active and passive range-of-motion tests using standard qualitative and quantitative techniques

4. use manual muscle-testing techniques

5. administer appropriate sensory and neurological tests

6. administer functional tests and activity-specific tests

7. identify, palpate, and interpret the integrity of bony landmarks

8. identify, palpate, and interpret the integrity of soft tissue

9. administer commonly used special tests to make a differential assessment of the following:

    a) intervertebral disc herniation (e.g., Valsalva's maneuver)
    b) neuropathy (e.g., straight leg raise test, well straight leg test, Babinski's reflex test, Oppenheim's gait test, Kernig's sign, Brudzinski sign test, bowstring test, Hoover sign test)
    c) vertebral defects (e.g., stork standing test/spondylolisthesis test)
    d) joint instability (e.g., spring test)

Hip/Pelvis Evaluation

The student will

1. obtain the medical history of an ill or injured athlete or other physically active individual.

2. observe and identify the clinical signs and symptoms associated with common injuries, illnesses, and predisposing conditions:

    a) leg length discrepancies
    b) hip retroversion
    c) hip anteversion
    d) Legg-Calve-Perthes disease
    e) apophysitis
    f) slipped capital femoral epiphysis
    g) dislocation or subluxation
    h) fracture
    i) stress fracture
    j) osteitis pubis
    k) athletic pubalgia
    l) bursitis
    m) piriformis syndrome
    n) iliotibial band syndrome o. contusion
    o) sprain
    p) strain
    q) tendonitis

3. administer active and passive range-of-motion tests using standard goniometric techniques and/or a tape measure

4. use manual muscle-testing techniques

5. administer appropriate sensory, neurological, and circulatory tests

6. administer functional tests and activity-specific tests

7. identify, palpate, and interpret the integrity of bony landmarks

8. identify, palpate, and interpret the integrity of soft tissue

9. administer commonly used special tests to make a differential assessment of the following:

    a) sacroiliac dysfunction (e.g., Patrick's/FABER, Gaenslen's test, pelvic compression/distraction test)
    b) neuropathy (e.g., femoral nerve traction test)
    c) neuromuscular pathology (e.g., Trendelenburg test, Thomas test, rectus femoris contracture test, Ober test, Noble's test, piriformis test)

Knee Evaluation

The student will

1. obtain the medical history of an ill or injured athlete or other physically active individual

2. observe and identify the clinical signs and symptoms associated with common injuries, illnesses, and predisposing conditions:

    a) bursitis
    b) chondromalacia patella
    c) dislocation and subluxation
    d) fat pad contusion
    e) fracture
    f) leg length
    g) meniscal tear
    h) Osgood-Schlatter disease
    i) osteochondritis dissecans
    j) patellar alignment (e.g., patella aha, patella baja, squinting patella, Q angle)
    k) patellar tendon rupture
    l) peroneal nerve contusion or palsy
    m) popliteal cyst
    n) sprain

o) strain
p) tendonitis
q) tibial torsion
r) tibiofemoral alignment (e.g., genu recurvatum, genu valgum, genu varum)

3. administer active and passive range-of-motion tests using standard goniometric techniques

4. use manual muscle-testing techniques

5. administer appropriate sensory, neurological, and circulatory tests

6. administer functional tests and activity-specific tests

7. identify, palpate, and interpret the integrity of bony landmarks

8. identify, palpate, and interpret the integrity of soft tissue

9. administer commonly used special tests to make a differential assessment of the following:

   a) uniplanar stress tests (e.g., valgus stress test, varus stress test, Lachman test, anterior drawer test, posterior drawer test, posterior sag sign)
   b) multiplanar (rotational) stress tests (e.g., Slocum test, Hughston's test, lateral pivot shift maneuver)
   c) meniscal tears (e.g., McMurray's test, Apley's test)
   d) patellofemoral dysfunction (e.g., grind test, apprehension test)
   e) intra-extracapsular swelling (e.g., sweep test, ballottable patella)

Leg, Ankle and Foot Evaluation

The student will

1. obtain the medical history of an ill or injured athlete or other physically active individual

2. observe and identify the clinical signs and symptoms associated with the following common injuries, illnesses, and predisposing conditions:

   a) overuse injures (e.g., bursitis, exostosis, fasciitis, stress fracture, tarsal tunnel syndrome, tendonitis and/or tenosynovitis, tibial stress syndrome)
   b) Achilles tendon rupture
   c) compartment syndromes
   d) apophysitis

e) dislocation or subluxation
f) foot type/structure (e.g., forefoot varus/valgus, equinus deformity, pes cavus/planus, plantar flexed first ray, rearfoot [hindfoot] varus/valgus)
g) fracture
h) deep vein thrombosis (e.g., Homans' sign)
i) neuroma
j) osteochondritis dissecans
k) sprain
l) strain
m) toe structure/alignment (e.g., bunion, claw toes, hallux rigidus, hallux valgus, hammer toes, mallet toe, Morton's foot syndrome)
n) weight-bearing versus non-weight-bearing alignment
o) gait

3. administer active and passive range-of-motion tests using standard goniometric techniques

4. use manual muscle-testing techniques

5. administer appropriate sensory, neurological, and circulatory tests

6. administer functional tests and activity-specific tests

7. identify, palpate, and interpret the integrity of bony landmarks

8. identify, palpate, and interpret the integrity of soft tissue

9. administer the following commonly used special tests to make a differential assessment:

a) compression test (e.g., Pott's fracture)
b) percussion test
c) anterior drawer test
d) Kleiger's test
e) talar tile test
f) Thompson test
g) Tinel's test
h) Homan's sign

Acute Care of Injury and Illness

This content area is a collection of the knowledge, skills, and values that the entry-level certified athletic trainer must possess to recognize, assess, and treat the acute injuries and illnesses of athletes and others involved in physical activity and to provide appropriate medical referral.

Cognitive Domain

1. Explains the legal, moral, and ethical parameters that define the scope of first aid and emergency care, and identifies the proper roles and responsibilities of the certified athletic trainer.

2. Describes the availability, contents, purposes, and maintenance of contemporary first aid and emergency care equipment.

3. Determines what emergency care supplies and equipment are necessary for event coverage, such as biohazardous waste disposal containers, splints, short-distance transportation equipment, emergency access tools, primary survey instruments (CPR mask, bag-valve-mask), and ice.

4. Interprets standard nomenclature of athletic injuries and illnesses.

5. Recognizes appropriate written medical documentation and abbreviations.

6. Describes the principles and rationale for a primary survey of the airway, breathing, and circulation.

7. Differentiates the components of a secondary survey, including obtaining a history, inspection and observation, palpation, and the use of special tests to determine the type and severity of the injury or illness sustained.

8. Interprets vital signs as normal or abnormal including, but not limited to, blood pressure, pulse, respiration, and body temperature.

9. Assesses pathological signs of injury including, but not limited to, skin temperature, skin color, skin moisture, pupil reaction, and neurovascular function.

10. Applies the current standards of first aid, emergency care, rescue breathing, and cardiopulmonary resuscitation for the professional rescuer, including (1) use of a bag-valve-mask, (2) use of a pocket mask, and (3) the chin lift-jaw thrust maneuver.

11. Describes the role and function of an automated external defibrillator in the

emergency management of acute heart failure and abnormal heart rhythms.

12. Describes the role and function of oxygen administration as an adjunct to cardiopulmonary resuscitation techniques.

13. Recognizes the characteristics of common life-threatening conditions that can occur either spontaneously or .as the result of direct trauma to the throat, thorax and viscera, and identifies the management of these conditions.

14. Describes the management of external hemorrhage, including the location of pressure points, use of universal precautions, and proper disposal of biohazardous materials.

15. Recognizes signs and symptoms associated with internal hemorrhaging.

16. Recommends the appropriate use of aseptic or sterile techniques, approved sanitation methods, and universal precautions for the cleansing and dressing of wounds.

17. Discriminates those wounds that require medical referral.

18. Explains the application principles of cold application, elevation, and compression in treatment of acute non-limb-threatening pathologies.

19. Cites the signs, symptoms, and pathology of acute inflammation.

20. Recognizes signs and symptoms of head trauma, including loss of consciousness, changes in standardized neurological, cranial nerve assessment, and other symptoms that indicate underlying trauma.

21. Explains and interprets the signs and symptoms associated with increasing intracranial pressure.

22. Explains the importance of monitoring a patient following a head injury, including obtaining clearance from a physician before further patient participation.

23. Defines cerebral concussion and lists the signs and symptoms used to classify cerebral concussions according to accepted grading scales (e.g., Cantu, Colorado, Torg, American Neurology Association standards).

24. Recognizes the signs and symptoms of trauma to the cervical, thoracic and lumbar spines, the spinal cord, and spinal nerve roots, including neurological signs, referred symptoms, and other symptoms that indicate underlying trauma.

25. Selects a cervical stabilization device that is appropriate to the circumstances of the

injury.

26. Recites the indications and guidelines for removing the helmet and shoulder pads from an athlete with a suspected cervical spine injury.

27. Describes the proper techniques for removing the helmet and shoulder pads from an athlete with a suspected cervical spine injury.

28. Describes the proper techniques and necessary supplies for removing equipment and clothing in order to evaluate and/or stabilize the involved area.

29. Recognizes proper positioning and immobilization of a person with a suspected spinal cord injury when using a spine board or body splint, including preparatory positioning prior to placement of the spine board or body splint.

30. Explains the need for leadership and teamwork when using a spine board or body splint.

31. Identifies the appropriate short-distance transportation method for an injured athlete or other physically active individual, including immobilization if applicable.

32. Recognizes the signs and symptoms of shock.

33. Identifies the different types of shock type (traumatic, hypovolemic, anaphylactic, septic) and the proper management of each.

34. Differentiates the signs and symptoms of diabetic coma and insulin shock.

35. Describes the proper treatments of diabetic coma and insulin shock.

36. Describes the appropriate treatment of a seizure.

37. Recognizes the signs and symptoms of toxic drug overdose.

38. Describes the signs, symptoms, and causes of allergic, thermal, and chemical reactions of the skin.

39. Recognizes the differences between infestations, insect bites, and other skin conditions.

40. Recognizes the signs and symptoms of common infectious diseases, and takes appropriate steps to prevent disease transmission through appropriate medical referral (see General Medical Clinical Proficiencies, 61-64, for a list of common infectious diseases).

41. Recognizes the signs, symptoms, and treatment of individuals suffering from adverse reactions to environmental conditions.

42. Uses the information obtained during the examination to determine when to refer an injury or illness for further or immediate medical attention (e.g., a life- or limb-threatening situation).

43. Describes the proper immobilization techniques and selects the appropriate splinting material to stabilize the injured joint or limb and maintain distal circulation.

44. Recognizes the proper technique for using ambulatory aids, including selecting an aid appropriate for the injury and person.

45. Recommends ambulatory aids to coordinate movement on flat, slippery, or uneven terrain and to -navigate steps, ramps, doors, or obstacles, and evaluates the patient's technique in using the aids.

46. Constructs and educates the patient regarding home care and self-treatment plans.

Psychomotor Domain

1. Acquires and maintains skills in first aid and emergency care.

2. Acquires and maintains skill in rescue breathing and CPR, including two-person skills and the use of a bag-valve-mask and a pocket mask.

3. Performs a primary survey/assessment in appropriate situations.

4. Performs a secondary survey/assessment, including obtaining a history, inspection/observation, palpation, and using special tests.

5. Palpates a variety of anatomic locations to assess the pulse in resting (non-emergency) and trauma situations.

6. Demonstrates proper use of universal precautions and aseptic or sterile techniques when controlling external hemorrhaging.

7. Demonstrates proper wound cleaning and care, including the use of barriers, aseptic protocols, and disposal of biohazardous waste.

8. Administers cryotherapy, elevation, and compression to a limb and/or joint.

9. Assesses a patient for possible closed-head trauma using standard neurological tests and tests for cranial nerve function.

10. Demonstrates the proper technique for removing a face mask from a helmeted athlete in respiratory distress or arrest.

11. Demonstrates the proper technique for removing the helmet, shoulder pads, and other protective equipment from an athlete with a possible cervical injury.

12. Demonstrates the proper technique for removing the helmet, shoulder pads, and other protective equipment from an athlete with an injury to the trunk or extremities.

13. Applies various cervical stabilization devices correctly, with the victim in various positions.

14. Performs the correct technique for moving an injured person safely onto a spine board for stabilization and transportation purposes.

15. Palpates for the rigidity, guarding, and rebound tenderness of the abdomen associated with internal injury or illness.

16. Performs proper care and positioning of an individual suffering from shock.

17. Applies various types of splints to different body parts, employing different constructions of splinting materials and allowing for distal pulse palpation.

18. Performs short-distance transportation using proper positioning techniques, immobilization, and appropriate transportation methods.

19. Demonstrates the proper techniques for using ambulatory aids to coordinate movement on flat, slippery, or uneven terrain and to navigate steps, ramps, doors, or obstacles.

20. Fabricates, applies, adjusts, and removes commonly used immobilization devices.

21. Fabricates, applies, adjusts, and removes special protective equipment (braces, special pads, modified taping procedures).

Affective Domain

1. Appreciates the medical-legal and ethical protocol governing the referral of injured and ill athletes and other individuals engaged in physical activity.

2. Appreciates the legal, moral, and ethical parameters that define the scope of first aid and emergency care, and values the proper role of the certified athletic trainer in providing this care.

3. Appreciates the roles and responsibilities of various community-based emergency care personnel (paramedics, emergency medical technicians, emergency room personnel).

4. Appreciates the role and function of various medical/paramedical specialties, and values their respective areas of expertise in the definitive treatment of acute injuries and illnesses.

5. Values the importance of certification in first aid and emergency care and cardiopulmonary resuscitation.

6. Appreciates the systematic approach to acute injury or illness of the secondary survey components of obtaining a history, inspection/observation, palpation, and using special tests.

7. Realizes the importance of identifying signs and symptoms in cases of possible shock, internal bleeding, and closed-head trauma.

8. Advocates the principles of proper splinting techniques to prevent further injury.

9. Appreciates the construction of various splinting devices and the appropriate uses for each.

10. Appreciates state laws, rules, and regulations governing the application of immobilization devices

11. Values the proper positioning and securing of a person with a suspected spinal injury onto a spine board or body splint, including preparatory positioning prior to placement of the spine board or body splint, as critical for prevention of further trauma.

12. Appreciates the need for leadership and teamwork when using a spine board or body splint.

13. Respects short-distance transportation techniques as a crucial means of moving an injured person.

14. Supports the application of cryotherapy, elevation, and compression as primary care for a non-threatening injury.

15. Accepts the approved aseptic and sterile methods for cleaning, treating, and bandaging wounds and for disposing of biohazardous waste.

16. Empathizes with individuals facing the daily challenges of using ambulatory aids.

Acute Care of Injury and Illness
Athletic Training Clinical Proficiencies

Teaching Objective 1:

The student will demonstrate the ability to implement an emergency action plan (EAP).

Specific Outcomes

1. The student will demonstrate the ability to implement an EAP for an activity, setting, or event.

2. The student will correctly triage emergency situations.

Teaching Objective 2:

The student will demonstrate the ability to apply first-aid techniques using universal precautions.

Specific Outcomes

The student will demonstrate the ability to

a) manage open and closed wounds
b) apply direct and indirect pressure to control bleeding
c) clean, debride, and protect an open wound
d) apply superficial skin closures
e) properly apply and remove gloves and other personal protective equipment
f) properly dispose of biohazardous waste
g) apply appropriate dressings
h) apply ice, compression, and elevation to an acute sprain, strain, or contusion

Teaching Objective 3:

The student will demonstrate the ability to apply immobilization devices to applicable body parts.

Specific Outcomes

1. The student will demonstrate the ability to

   a) select and apply an appropriate splint to a sprain, strain, fracture, subluxation,

and dislocation
b) stabilize and spine board or body splint an adult or child with a suspected spinal injury

Teaching Objective 4:

The student will recognize and manage environmentally related injuries and illnesses and, when indicated, refer the patient to the proper medical professional.

Specific Outcomes

1. The student will evaluate and manage the following:

    a) heat exhaustion
    b) heat syncope
    c) heat stroke
    d) hypothermia

Teaching Objective 5:

The student will demonstrate the ability to perform basic life-support techniques.

Specific Outcomes

1. The student will demonstrate the ability to

    a) establish and manage an airway
    b) establish and manage an airway in an athlete wearing protective headgear
    c) perform CPR on an adult or child with or without a spinal injury
    d) use a bag-valve-mask (BVM) on an adult or child for rescue breathing
    e) use a protective pocket mask/shield on an adult or child for rescue breathing

Teaching Objective 6:

The student will demonstrate the ability to use various methods of stabilization and transportation to facilitate the movement or ambulation of the injured person.

Specific Outcomes

1. The student will demonstrate the ability to

    a) stabilize and transport an adult or child with a head and/or spinal injury
    b) stabilize and transport an adult or child with a fracture and/or dislocation

c) select, fit, and instruct the patient in the use of crutches
d) select, fit, and instruct the patient in the use of a cane
e) transport an injured adult or child using a manual conveyance technique
f) perform two-person CPR
g) assist a drowning victim

Pharmacology

This content area is a collection of the knowledge, skills, and values that the entry-level certified athletic trainer must possess in pharmacologic applications, including awareness of the indications, contraindications, precautions, and interactions of medications and of the governing regulations relevant to the treatment of injuries to and illnesses of athletes and others involved in physical activity.

Cognitive Domain

1. Recognizes the general concepts and differences in the legal regulation of non-prescription, prescription, and classified pharmaceuticals.

2. Recalls and can access the laws, regulations, and procedures that govern storage, transportation, dispensation, and recording prescription and nonprescription medications (Controlled Substance Act, scheduled drug classification, and state statutes).

3. Identifies the role of the Food and Drug Administration (FDA) in approving and recalling drugs.

4. Identifies appropriate terminology and pharmaceutical abbreviations used in the prescription and dispensation of medications.

5. Identifies the common resources used to identify indications, contraindications, precautions, and adverse reactions for prescription and nonprescription medications.

6. Recalls how the concept of potency and expiration affects drug dose protocols.

7. Identifies common methods used to administer medication.

8. Relates the relationship of generic to brand name pharmaceuticals.

9. Describes the kinetic process of absorption, distribution, metabolism, and elimination of administered medication.

10. Describes how physical activity may influence a drug's therapeutic effect.

11. Illustrates the general concepts of dissolution, bioavailability, and bioequivalence.

12. Recognizes the general action of biotransformation in the biochemical reactions that occur during drug absorption.

13. Recognizes that adverse drug reactions can be immediate (acute) or delayed (chronic).

14. Describes the potential risks of co-interaction between two or more pharmaceutical agents.

15. Recognizes the difference between cortical and anabolic steroids and other androgenics.

16. Describes the general indications, contraindications, and adverse reactions of prescription and nonprescription anti-inflammatory and ant arthritic medications (e.g., steroidal and nonsteroidal).

17. Lists the general indications, contraindications, and adverse reactions of commonly used prescription and nonprescription analgesic medications.

18. Lists the general indications, contraindications, and adverse reactions of prescription and non prescription local anesthetics.

19. Lists the general indications, contraindications, and adverse reactions of bronchodilators and other prescription and nonprescription respiratory medications as they relate to physical activity.

20. Identifies the general indications, contraindications, and adverse reactions of prescription and nonprescription antibiotics.

21. Identifies the general indications, contraindications, and adverse reactions of anaphylaxis medications.

22. Identifies the general adverse reactions of gastrointestinal prescription and nonprescription medications.

23. Lists the general indications, contraindications, and adverse reactions of beta-blockers and antihypertensives.

24. Recalls the general indications, contraindications, and adverse reactions of prescription and nonprescription topical applications.

25. Identifies the usage patterns, general effects, and adverse short- and long-term reactions of performance enhancing drugs.

Psychomotor Domain

1. Employs the Physician's Desk Reference (PDR), the Drug Facts and Comparisons, or

on-line services to obtain information on the medications prescribed for athletes and others involved in physical activity.

2. Follows federal, state, and local regulations regarding storing, transporting; dispensing, and recording medications.

3. Documents tracking of medications by name, manufacturer, amount, dosage, lot number, and expiration date.

4. Replicates procedures for storage and inventory of medications.

5. Reviews and adheres to a policies-and-procedures manual as it relates to medications.

6. Replicates the procedure for using an emergency epinephrine injection to prevent anaphylaxis as per physician instruction.

7. Replicates procedures for using an asthmatic inhaler to prevent and treat exercise-induced bronchial spasms and/or asthmatic conditions.

Affective Domain

1. Recognizes that pharmacology applies to the immediate and ongoing care of injury and illness.

2. Recognizes the importance of pharmacological concepts in health care.

3. Accepts physician (or other qualified health care provider) and pharmacist consultation as a legal, moral, and ethical necessity in the prescription and dispensation of medication.

4. Appreciates the use of clinical references such as the PDR and clinical databases to identify medications.

5. Accepts the laws and regulations that govern the storage, transportation, and dispensation of all drugs.

6. Supports the moral and ethical behavior of athletic trainers in dealing with the issues of drug use and abuse in sports.

7. Accepts moral and ethical responsibility for maintaining current knowledge of the medications commonly prescribed to athletes and others involved in physical activity.

8. Advocates moral and ethical behavior of self and colleagues in dealing with issues of a pharmacological nature.

9. Promotes accountability for moral and ethical decision-making in pharmacological issues.

Pharmacology
Athletic Training Clinical Proficiencies

Teaching Objective 1

The student will locate and utilize pharmaceutical products, storage, dispensing, and tracking information.

Specific Outcomes

The student will

1. Use the PDR or another drug reference to search for information on the medications commonly prescribed to athletes and others involved in physical activity and to identify the following facts:

    a) generic and brand names
    b) indications for use
    c) contraindications
    d) warnings
    e) dosing
    f) other notes (e.g., banned substance)
    g) side (adverse) effects

2. Document, or simulate the documentation of, the tracking of medications by recording the following information about the medication:

    h) name
    i) manufacturer
    j) amount
    k) dosage
    l) lot number
    m) expiration date

3. Locate the policies-and-procedures manual, identify the section on medications, and replicate the procedures for administering medications to athletes and others involved in physical activity, which include the following:

    a) Determine type of over-the-counter (OTC) medication to be used according to the physical ailment and established protocols
    b) identify the precautions, expiration date, lot number, and dosage for the medication as provided on the package and individual dose packets

c) administer OTC medication by providing verbal and written instruction for its use to the patient and then recording and documenting the administration

Teaching Objective 2

The student will activate a poison control service.

Specific Outcome

1. Locate the phone number and address of the nearest poison control center and replicate the reporting of a drug overdose or poisoning situation. The report should state the following information:

    a) name and location of person making the call
    b) name and age of person who has taken the medication
    c) name and dosage of the drug taken
    d) time the drug was taken
    e) signs and symptoms associated with overdose or poison situation, including vital signs

Teaching Objective 3

The student will demonstrate the ability to instruct the use of and administer bronchodilators and epinephrine.

Specific Outcome

1. Replicate the following procedures for using an emergency epinephrine injection to prevent anaphylaxis.

    a) Identify indications for an epinephrine injection
    b) Demonstrate proper use through verbal and nonverbal instruction
    c) Identify signs and symptoms that might indicate an allergic reaction to or overdose of epinephrine
    d) Demonstrate proper storage of epinephrine injectable
    e) Demonstrate proper disposal of used injection system

2. Replicate the following procedures for using an emergency bronchodilator (inhaler) to prevent asthma attacks.

    a) Identify indications for use of a bronchodilator
    b) Demonstrate proper use through verbal and nonverbal instruction
    c) Identify signs and symptoms that might indicate an allergic reaction to or

overdose of a bronchodilator

d) Demonstrate proper storage of a bronchodilator

Therapeutic Modalities

This content area is a collection of knowledge, skills, and values that the entry-level certified athletic trainer must possess to plan, implement, document, and evaluate the efficacy of therapeutic modalities in the treatment of injuries to and illnesses of athletes and others involved in physical activity.

Cognitive Domain

1. Determines the appropriate modality according to the treatment goals and objectives as they relate to wound healing and tissue repair.

2. Describes methods of evaluating and recording progress of therapeutic modality treatments.

3. Illustrates the use of volumetric and anthropometric measurements to determine the effectiveness of treatment outcomes.

4. Identifies the body's physiological responses during and following the application of therapeutic modalities.

5. Describes the role and function of the common prescription and nonprescription pharmacological agents that are used in conjunction with therapeutic modalities (e.g., topical ointments, phonophoresis, iontophoresis.

6. Explains the principles of physics, including basic concepts associated with the electromagnetic and acoustic spectra (e.g., frequency, wavelength).

7. Interprets terminology, principles, and basic concepts of electrical units (e.g., amperes, volts, watts, ohms).

8. Compares and contrasts contemporary pain-control theories.

9. Assesses the selection and use of therapeutic modalities for the control of acute and chronic pain.

10. Describes the electrophysics, biophysics, set-up, indications, contraindications, and specific physiological effects associated with stimulating electrical currents.

11. Describes the electrophysics, biophysics, set-up, indications, contraindications, and specific physiological effects associated with short-wave diathermy.

12. Describes the physical properties, biophysics, set-up, indications, contraindications,

and specific physiological effects associated with the application of superficial heat and cold.

13. Describes the physical properties, biophysics, set-up, indications, contraindications, and specific physiological effects associated with therapeutic ultrasound.

14. Describes the physical properties, biophysics, set-up, indications, contraindications, and specific physiological effects associated with the application of intermittent compression units.

15. Describes the physical properties, biophysics, set-up, indications, contraindications, and specific physiological effects associated with cervical and lumbar traction devices.

16. Describes the physical properties, biophysics, set-up, indications, contraindications, and specific physiological effects associated with therapeutic LASER.

17. Describes the physical properties, biophysics, set-up, indications, contraindications, and specific physiological effects associated with the application of electromyogram (EMG) and biofeedback devices.

18. Describes the physical properties, biophysics, set-up, indications, contraindications, and specific physiological effects associated with therapeutic soft-tissue massage.

19. Illustrates the typical physiological and psychological responses to trauma as they relate to the use of therapeutic modalities.

20. Interprets local, state, and federal standards for the operation and safety standards of therapeutic modalities.

21. Describes the manufacturer's protocol for use to ensure safe and proper application.

22. Applies manufacturer's guidelines for the inspection and maintenance of therapeutic modalities.

Psychomotor Domain

1. Utilizes assessment skills to determine a patient's specific therapeutic modality indications, contraindications, and precautions.

2. Measures limb edema and effusion using volumetric tank and anthropometric measurements.

3. Takes into account patient-specific indications, contraindications, and precautions

when applying a specific therapeutic modality (e.g., age, underlying pathology, disease processes).

4. Performs appropriate patient preparation and positioning for therapeutic modality application.

5. Performs the appropriate set-up for therapeutic modalities.

6. Selects and applies appropriate therapeutic modality parameters (e.g., intensity, length of time, duration, frequency), and modifies them as required.

7. Operates and applies contemporary therapeutic modalities (electrical stimulating currents, thermotherapy, cryotherapy, diathermy, ultrasound, intermittent compression, cervical and lumbar traction, laser, EMG and biofeedback, soft tissue massage, and other contemporary therapeutic modalities) according to established guidelines.

8. Evaluates patient response to therapeutic modalities during and following the application of therapeutic modalities.

9. Formulates progress notes and treatment outcomes that are relevant to the selection and application of therapeutic modalities.

10. Inspects the therapeutic modalities and treatment area for potential safety hazards.

Affective Domain

1. Accepts the professional, ethical, and legal parameters that define the proper role of the certified athletic trainer in the use of therapeutic agents to treat, rehabilitate, and recondition athletes and others involved in physical activity.

2. Respects the role of attending physicians and other medical and allied health personnel in the use of therapeutic agents to treat, rehabilitate, and recondition athletes and others involved in physical activity.

3. Advocates the accepted medical protocol regarding the confidentiality of medical information relative to therapeutic modality treatments.

4. Initiates accepted medical protocol regarding therapeutic prescriptions.

5. Promotes the accepted medical protocol regarding health care referral in the rehabilitation and reconditioning process.

Therapeutic Modalities
Athletic Training Clinical Proficiencies

Teaching Objective 1:

The student will relate the findings of a physical examination to determine the appropriate course of treatment.

Specific Outcomes

1. The student will perform a physical examination to identify the current inflammatory stage.

2. The student will perform a physical examination and interview to identify the indications, contraindications, and precautions to various treatment protocols.

Teaching Objective 2:

The student will demonstrate the ability to apply therapeutic modalities.

Specific Outcomes

Cryotherapy

1. The student will demonstrate the ability to select the appropriate parameters for and then prepare and apply the following:

    a) cold whirlpool treatment
    b) controlled cold therapy unit
    c) ice pack
    d) vapo-coolant spray
    e) Ice Immersion
    f) ice massage
    g) cryokinetics

Thermotherapy

2. The student will demonstrate the ability to select the appropriate parameters for and then prepare and apply the following:

    a) moist heat pack
    b) paraffin treatment

c) contrast bath
d) warm whirlpool treatment

Electrotherapy

1. The student will demonstrate the ability to select the appropriate parameters for and then prepare and apply the following:

    a) sensory-level pain control treatment
    b) noxious-level pain control treatment
    c) motor-level pain control treatment
    d) muscle re-education treatment
    e) muscle pumping treatment

2. The student will set-up and apply the following types of electrical stimulation units:

    a) monophasic stimulator (e.g., high volt stimulation)
    b) biphasic stimulator (e.g., Transcutaneous Electrical Nerve Stimulation [TENS], Neuromuscular Electrical Stimulation [NMES])
    c) direct current(e.g., iontophoresis)
    d) alternating current (e.g., interferential, NMES)
    e) multifunction electrical stimulation devices
    f) muscle atrophy retardation treatment
    g) acute edema treatment
    h) muscle splinting/spasm treatment
    i) iontophoresis treatment

Ultrasound

1. The student will demonstrate the ability to select the appropriate parameters for and then prepare and apply the following:

    a) thermal ultrasound treatment
    b) non-thermal ultrasound treatment
    c) combination electrical-stimulation/ultrasound treatment
    d) phonophoresis treatment
    e) indirect application of ultrasound treatment (underwater, bladder)

Traction

1. The student will demonstrate the ability to select the appropriate parameters for and then prepare and apply the following:
    a) mechanical traction
    b) manual traction

c) positional traction

Intermittent Compression

1. The student will demonstrate the ability to select the appropriate parameters for and then prepare and apply intermittent compression to the upper and lower extremities.

Therapeutic Massage

1. The student will demonstrate the ability to prepare and apply a massage treatment.

2. The student will demonstrate the ability to properly perform the following therapeutic massage strokes:

   a) effleurage
   b) petrissage
   c) friction (circular, transverse)
   d) tapotement
   e) vibration
   f) myofascial release techniques

Therapeutic Exercise

This content area is a collection of the knowledge, skills, and values that the entry-level certified athletic trainer must possess to plan, implement, document, and evaluate the efficacy of therapeutic exercise programs for the rehabilitation and reconditioning of the injuries and illnesses of athletes and others involved in physical activity.

Cognitive Domain

1. Predicts the physiological process of wound healing and tissue repair and its implications (limitations, contraindications) on the development and progression of an appropriate rehabilitation or reconditioning program.

2. Describes and interprets appropriate measurement and functional testing procedures as they relate to therapeutic exercise (e.g., use of isokinetic devices, goniometers and dynamometers, postural stability test, hop tests, specific function tests).

3. Uses objective measurement results (muscular strength/endurance, range of motion) as a basis for developing individualized rehabilitation or reconditioning programs.

4. Describes common surgical techniques, pathology, and any subsequent anatomical alterations that may affect the implementation of a rehabilitation or reconditioning exercise program.

5. Interprets the results of injury assessment and determines an appropriate rehabilitation or reconditioning plan to return the patient to physical activity.

6. Defines the basic components of activity-specific functional progressions in a therapeutic exercise program.

7. Describes the mechanical principles applied to the design and use of rehabilitation or reconditioning exercise equipment (leverage, force).

8. Recommends the appropriate therapeutic exercise plan and determines appropriate therapeutic goals and objectives based on the initial assessment, frequent reassessments, and appropriate goal setting.

9. Describes the appropriate selection and application of therapeutic exercises taking the following into consideration:

    a) the physiological responses of the human body to trauma
    b) the physiological effects of inactivity and immobilization on the musculoskeletal, cardiovascular, nervous, and respiratory systems of the

human body
c) the associated anatomical and/or biomechanical alterations of commonly used primary and reconstructive surgery
d) the physiological adaptations induced by the various forms of therapeutic exercise, such as fast- versus slow-twitch muscle fibers
e) the physiological responses of additional factors, such as age and disease.

10. Describes the indications, contraindications, theory, and principles for the incorporation and application of various contemporary therapeutic exercises, including the following:

    a) isometric, isotonic, and isokinetic exercise
    b) eccentric versus concentric exercise
    c) open- versus closed-kinetic chain exercise
    d) elastic, mechanical, and manual resistance exercise
    e) joint mobilization exercise
    f) plyometrics-dynamic reactive exercise
    g) proprioceptive neuromuscular facilitation (PNF) for muscular strength/endurance, muscle stretching, and improved range of motion
    h) exercises to improve neuromuscular coordination and proprioception
    i) passive, active, and active-assisted exercise
    j) cardiovascular exercise, including the use of stationary bicycles, upper-body ergometer,
    k) treadmill, and stair climber
    l) aquatic therapy
    m) functional rehabilitation and reconditioning
    n) sport-specific activity
    o) soft tissue mobilization

11. Revises goals and objectives, and develops criteria for progression and return to activity, based on the lever of functional outcomes.

12. Describes appropriate methods of assessing rehabilitation and reconditioning progress and interprets the results.

13. Interprets physician notes, post-operative notes, and physician prescriptions as they pertain to a rehabilitation or reconditioning plan.

14. Describes rehabilitation, functional, and reconditioning progress using follow-up notes, progress notes, SOAP notes, etc.

15. Compares the effectiveness of taping, wrapping, bracing, and other supportive/protective methods for facilitation of safe progression to advanced therapeutic exercises and functional activities.

16. Applies manufacturer's guidelines for the inspection and maintenance of therapeutic exercise equipment.

Psychomotor Domain

1. Demonstrates appropriate methods of evaluating rehabilitation and reconditioning progress and interpreting results.

2. Measures the physical effects of injury using contemporary methods (isokinetic devices, goniometers, dynamometers, manual muscle testing, calipers, functional testing) and uses this data as a basis for developing individualized rehabilitation or reconditioning programs.

3. Records rehabilitation or reconditioning progress (e.g., follow-up notes, progress notes).

4. Demonstrates the appropriate application of contemporary therapeutic exercises including the following:

    a) isometric, isotonic, and isokinetic exercise
    b) eccentric versus concentric exercise
    c) open- versus closed-kinematic chain exercise
    d) elastic, mechanical, and manual resistance exercise
    e) joint mobilization exercise
    f) plyometrics-dynamic reactive exercise
    g) proprioceptive neuromuscular facilitation (PNF) for muscular strength/endurance, muscle stretching, and improved range of motion
    h) exercises to improve neuromuscular coordination and proprioception
    i) passive, active, and active-assisted exercise
    j) cardiovascular exercise, including the use of stationary bicycles, upper-body ergometer,
    k) treadmill, and stair climber
    l) aquatic therapy
    m) functional rehabilitation and reconditioning
    n) sport-specific activity
    o) soft tissue mobilization

5. Demonstrates the proper techniques for the performance of commonly prescribed rehabilitation and reconditioning exercises.

6. Performs a functional assessment for safe return to physical activity.

7. Inspects therapeutic exercise equipment to ensure safe operating condition.

Affective Domain

1. Accepts the professional, ethical, and legal parameters that define the proper role of the certified athletic trainer in the treatment, rehabilitation, or reconditioning of athletes and others involved in physical activity.

2. Accepts the moral and ethical obligation to provide rehabilitation or reconditioning to athletes and others involved in physical activity to the fullest extent possible.

3. Respects the proper role of attending physicians and other medical and paramedical personnel in the treatment and rehabilitation or reconditioning of athletes and others involved in physical activity.

4. Respects accepted medical and paramedical protocols regarding the confidentiality of medical information, medical and therapeutic prescriptions, and health care referral as they relate to the rehabilitation or reconditioning process.

Therapeutic Exercise
Athletic Training Clinical Proficiencies

Teaching Objective 1:

The student will demonstrate the ability to perform therapeutic exercises.

Specific Outcomes

1. Exercise to improve the range of motion of the upper extremity, lower extremity, trunk, and cervical spine.

The student will demonstrate the ability to instruct the following exercises:

a) passive range-of-motion exercises
b) active range-of-motion exercises
c) active-assisted range-of-motion exercises
d) joint mobilization
e) self-mobilizations

2. Exercise to improve muscular strength.

The student will demonstrate the ability to instruct exercises for the following parts of the body using isometric and progressive resistance techniques:

a) lower extremity
b) upper extremity
c) cervical spine
d) trunk and torso

3. Exercise to improve muscular endurance.

The student will demonstrate the ability to instruct the following exercise modalities:

Lower Body

a) aquatic
b) stationary bicycle
c) stair
d) physioballs
e) treadmill

Upper body

a) aquatic
b) UBE/stationary bicycle
c) physioballs

4. Exercise to improve muscular speed.

The student will demonstrate the ability to instruct the following activities:

Upper body

a) reaction drills
b) sprint work
c) Fartlek training

Lower body

a) reaction drills

5. Exercise to improve muscular power.

The student will demonstrate the ability to instruct plyometric exercises for the upper and lower extremities.

6. Exercise to improve neuromuscular control and coordination.

The student will demonstrate the ability to instruct the following activities:

Upper body

a) PNF patterns
b) rhythmic stabilization
c) double- and single-arm balancing
d) wobble board or balance apparatus
e) weighted-ball rebounding or toss

Lower Body

a) PNF patterns
b) proprioception board or balance apparatus
c) incline board
d) Single-leg balancing

Neck

a) stabilization
b) postural correction

Trunk

a) stabilization
b) postural correction

7. Exercise to improve agility.

The student will demonstrate the ability to instruct the following activities:

Upper body

a) throwing
b) catching

Lower Body

a) Carioca
b) cross-over
c) figure eight (8)

8. Exercise to improve cardiorespiratory endurance.

The student will demonstrate the ability to instruct the following activities:

Upper body

a) upper-body ergometer
b) stationary bicycle
c) aquatic
d) stair climber

Lower Body

a) bicycle ergometer
b) treadmill
c) stair climber
d) aquatic

9. The student will demonstrate the ability to assess joint end point and to select and

perform appropriate joint mobilization techniques for the appendicular and axial skeleton, including the following:

a) long-axis distraction
b) appropriate glides (e.g., anterior/posterior, superior/inferior)

10. The student will demonstrate the ability to instruct and perform exercises to improve activity specific skills (running, striking, throwing, catching, swimming, biking, climbing, etc.).

General Medical Conditions and Disabilities

This content area is a collection of knowledge, skills, and values that the entry-level certified athletic trainer must possess to recognize, treat, and *refer,* when appropriate, the general medical conditions and disabilities of athletes and others involved in physical activity.

Cognitive Domain

1. Describes congenital or acquired abnormalities, physical disabilities, and diseases.

2. Identifies common illnesses and diseases of the body's systems based on contemporary epidemiological studies of the injuries of athletes and others involved in physical activity.

3. Describes the general principles of health maintenance and personal hygiene, including skin care, dental hygiene, sanitation, immunizations, avoidance of infectious and contagious diseases, diet, rest, exercise, and weight control.

4. Recognizes common eye pathologies (e.g., conjunctivitis, hyphema, corneal injury, and scleral trauma).

5. Recognizes common ear pathologies (e.g., otitis, ruptured tympanic membrane, and impacted cerumen).

6. Recognizes common pathologies of the mouth, sinus, oropharynx, and nasopharynx.

7. Lists the common causes, signs, and symptoms of respiratory infections (e.g., pneumonia, bronchitis, sinusitis, URI, and asthma).

8. Describes the use of a peak-flow meter in the evaluation and management of respiratory conditions.

9. Describes strategies for reducing the frequency and severity of asthma attacks.

10. Compares and contrasts the signs and symptoms of respiratory tract conditions (e.g., common cold, influenza, allergic rhinitis, sinusitis, bronchitis, asthma, pneumonia, and pleurisy).

11. Identifies the possible causes of sudden death syndrome among athletes and others involved in physical activity.

12. Recognizes the relationship between changes in blood pressure and changes in

activity level.

13. Recognizes the relationship between changes of respiration rate and changes in activity level.

14. Explains the typical history, signs, and symptoms associated with cardiopulmonary conditions.

15. Describes common heart conditions, such as coronary artery disease, hypertrophic cardiomyopathy, heart murmurs, and mitral valve prolapse.

16. Identifies the typical symptoms and clinical signs of an injury or illness, including those associated with local tissue inflammation (cellulitis) and systemic infection (lymphangitis, lymphadenitis, bacteremia).

17. Describes the common conditions that affect the liver, gall bladder, and pancreas (e.g., jaundice, hepatitis, diabetes mellitus, and pancreatitis).

18. Explains and recognizes the etiology, signs, symptoms, and management of diabetes mellitus.

19. Describes the signs and symptoms of the common disorders of the gastrointestinal tract.

20. Lists examples of the common conditions of the urinary tract, kidneys, and bladder (e.g., urinary tract infection [UTI] and kidney stones).

21. Lists the common infections and conditions of the male reproductive organs (e.g., epididymitis, varicocele, hydrocele, undescended testicle, and testicular cancer).

22. Lists the common infections and conditions of the female reproductive organs (e.g., pelvic inflammatory disease [PID], ectopic pregnancy, and pregnancy).

23. Describes the common conditions of the breast (e.g., gynecomastia, cancer, and fibrous cysts).

24. Describes the various menstrual irregularities, the relationship that physical activity plays in their development, their resolutions, and their implications on performance, as well as detrimental systemic effects (e.g., oligomenorrhea, amenorrhea, and dysmenorrhea).

25. Identifies the physiological effects and the changes to woman's body caused by pregnancy, and describes the body's response to exercise during pregnancy. Also identifies the indications and contraindications for exercise throughout pregnancy.

26. Describes the signs, symptoms, and management of common sexually transmitted diseases (STD).

27. Recognizes skin lesions (e.g., wounds and thermal, electrical, and radiation injury), infections (e.g., bacterial, fungal, and viral), and disorders (e.g., bites, acne, dermatitis, folliculitis, and eczema).

28. Identifies skin infections that are potentially contagious (e.g., impetigo, staph infection).

29. Recognizes conditions that affect bones and joints (e.g., epiphysitis, apophysitis, aseptic necrosis, arthritis, gout, and felon).

30. Describes common conditions that affect muscles (e.g., myositis, rhabdomyolysis).

31. Recognizes the main cerebral lesions caused by trauma (e.g., subdural, epidural hematoma, aneurysm).

32. Describes the etiology, signs, symptoms, and management of convulsive disorders.

33. Recognizes postconcussional syndrome.

34. Identifies the common signs and symptoms of contagious viral diseases.

35. Lists the advantages and disadvantages of sports participation by individuals with hepatitis B virus or human immunodeficiency virus (HIV).

36. Describes the etiology, signs, symptoms, and management of common viruses (e.g., human papillomavirus, Epstein-Barr virus, and hepatitis B virus).

37. Describes where and how to seek appropriate medical assistance on disease control, notification, and epidemic prevention.

Psychomotor Domain

1. Assesses the patient for congenital or acquired abnormalities, physical disabilities, and diseases that would predispose him or her to other injury or illness, or would exacerbate the existing condition(s).

2. Manages acute asthma attacks and takes appropriate steps to reduce the frequency and severity of asthma attacks.

3. Recognizes and refers individuals exhibiting a history, signs, and symptoms of

cardiopulmonary conditions to the appropriate medical authority.

4. Recognizes and manages the common disorders of the gastrointestinal tract.

5. Recognizes and applies the appropriate treatments for diabetic coma and insulin shock.

6. Acts quickly to contain skin infections that are potentially contagious, and refers the patient when appropriate.

7. Takes the appropriate steps to treat a seizure.

8. Recognizes and takes the appropriate steps to manage and control common contagious viral and infectious diseases.

9. Uses an otoscope correctly to examine the ear and nasal passages.

10. Use and interprets urine diagnostic Chemstrips (dipsticks).

11. Uses a penlight to examine pupil responsiveness, equality, and ocular motor function.

12. Palpates the abdominal quadrants for tenderness and rigidity.

13. Uses the stethoscope correctly to auscultate the heart, lungs, and bowel.

14. Assesses body temperature.

15. Assesses vital signs.

16. Refers an individual who presents with complaints of genitourinary or reproductive disorders to a physician.

17. Demonstrates the proper use and interpretation of a peak-flow meter (hand-held spirometer) in the assessment of asthmatic athletes and other asthmatics involved in physical activity.

Affective Domain

1. Supports the moral and ethical behavior of athletic trainers in issues dealing with diseases of athletics and physical activity.

2. Recognizes the moral and ethical responsibility of taking situational control in the containment of common contagious viral and infectious diseases.

3. Accepts the roles of medical and allied health personnel in the referral, management, and treatment of athletes and others involved in physical activity suffering from general medical conditions.

General Medical Conditions
Athletic Training Clinical Proficiencies

Specific Outcomes

The student will

1. Obtain a basic medical history that includes the following components:

    a) previous medical history
    b) previous surgical history
    c) pertinent family medical history
    d) current medication history
    e) relevant social history

2. Ascertain body temperature via the following:

    a) oral temperature
    b) axillary temperature
    c) tympanic temperature

3. Ascertain the following vital signs:

    a) blood pressure
    b) pulse (rate and quality)
    c) respirations (rate and quality)

4. Palpate the four abdominal quadrants to assess for the following:

    a) guarding and rigidity
    b) pain

5. Use a stethoscope to identify the following:

    a) normal breath sounds
    b) normal heart sounds
    c) normal bowel sounds

6. Identify pathological breathing patterns to make a differential assessment for the following respiratory conditions:

    a) apnea

b) tachypnea
c) hyperventilation
d) bradypnea
e) dyspnea
f) obstructed airway

7. Demonstrate proficiency in the use of an otoscope to examine the nose and the outer and middle ear.

8. Measure urine values with Chemstrips (dipsticks)

9. Recognize the signs, symptoms, and predisposing conditions associated with the following diseases and conditions:

The Skin

a) abscesses
b) acne vulgaris
c) carbuncle
d) cellulitis
e) molluscum contagiosum
f) dermatitis
g) eczema
h) folliculitis
i) frostbite
j) furunculosis.
k) herpes simplex
l) tinea versicolor
m) pediculosis
n) herpes zoster
o) hives
p) impetigo
q) psoriasis
r) ringworm
s) scabies
t) sebaceous cysts
u) tinea cruris
v) tinea pedis
w) verruca plantaris
x) verruca vulgaris
y) tinea capitis

The Eyes, Ears, Nose, and Throat

a) common cold
b) conjunctivitis
c) laryngitis
d) pharyngitis
e) rhinitis
f) sinusitis
g) tetanus
h) tonsillitis

Respiratory System

a) asthma
b) bronchitis
c) hyperventilation
d) hay fever
e) influenza
f) pneumonia
g) upper respiratory infection (URI)

Cardiovascular System

a) hypertension
b) hypertrophic myocardiopathy
c) hypotension
d) migraine headache
e) shock
f) syncope

Endocrine System

a) diabetes
b) hyperthyroidism
c) hypothyroidism
d) pancreatitis

Gastrointestinal Tract

a) appendicitis
b) colitis
c) constipation
d) diarrhea
e) esophageal reflux

f) gastritis
g) gastroenteritis
h) indigestion
i) ulcer
j) irritable bowel syndrome

Eating Disorders

a) anorexia
b) bulimia
c) obesity

Sexually Transmitted Diseases/Diseases Transmitted by Body Fluid

a) HIV/AIDS
b) hepatitis
c) chlamydia
d) genital warts
e) gonorrhea
f) syphilis

Genitourinary Tract and Organs

a) kidney stones
b) spermatic cord torsion
c) candidiasis
d) urethritis
e) urinary tract infection
f) hydrocele
g) varicocele

Gynecological Disorders

a) amenorrhea
b) dysmenorrhea
c) oligomenorrhea
d) pelvic inflammatory disease
e) vaginitis

Viral Syndromes

a) infectious mononucleosis
b) measles
c) mumps

Neurological Disorders

a) epilepsy
b) syncope
c) reflex sympathetic dystrophy
d) meningitis

Systemic Diseases

a) iron-deficiency anemia (systemic)
b) sickle cell anemia (systemic)
c) Lyme disease

Nutritional Aspects of Injuries and Illnesses

This content area is a collection of the knowledge, skills, and values that the entry-level certified athletic trainer must possess to understand and recognize the nutritional aspects of athletics and physical activity and to refer, when appropriate.

Cognitive Domain

1. Describes personal health habits (hygiene, diet, nutrition, weight control, proper amount of sleep, effects of alcohol, tobacco, and drugs) and their role in preventing injury or illness and in maintaining a healthy lifestyle.

2. Constructs methods to determine the recommended daily allowances (RDAs) of a healthy diet for athletes and others involved in physical activity.

3. Describes the nutritional food pyramid and explains its use.

4. Lists the primary organizations responsible for nutritional information.

5. Identifies the nutritional considerations in rehabilitation, including nutrients involved in healing and nutritional risk factors.

6. Explains the importance of good nutrition in enhancing performance and preventing injury and illness.

7. Describes the common illnesses and injuries that are attributed to poor nutrition.

8. Evaluates the energy and nutritional demands of specific activities and the nutritional demands placed on athletes and others involved in physical activity.

9. Delineates the effects of poor dietary habits on bone loss, injury, and long term health.

10. Applies the principles of nutrition, including the roles of fluids and electrolytes, vitamins, minerals, ergogenic aids, macronutrients, carbohydrates, protein, fat, and dietary supplements, as they relate to the dietary and nutritional needs of athletes and others involved in physical activity.

11. Illustrates the physiological processes and time factors involved in the digestion, absorption, and assimilation of food, fluids, and nutritional supplements as they relate to the design and planning of pre- and post-activity meals, considering menu content, time scheduling, and the effect of tension and anxiety before activity.

12. Paraphrases the prevailing misconceptions regarding the proper use of food, fluids, and nutritional supplements (common food fads and fallacies and strength or weight gain diets).

13. Describes the advantages or disadvantages of supplementing nutrients in the athlete's diet.

14. Describes the principles, advantages, and disadvantages of the ergogenic aids and dietary supplements 'used by athletes and others involved in physical activity, in an effort to improve performance.

15. Recognizes the implications of FDA endorsement of nutritional products.

16. Locates, obtains, and interprets scientific position papers describing healthy weight loss, fluid maintenance, disordered eating, nutritional ergogenic aids, diet supplements, and assessment of body composition in athletes and others involved in physical activity.

17. Analyzes the principles of weight control, including body fat percentage, caloric requirements, effects of exercise, and fluid loss.

18. Identifies the consequences of improper fluid replacement.

19. Describes and applies the principle of caloric balance.

20. Summarizes the proper use of food, fluids, and exercise in weight control to dispel the prevailing misconceptions regarding weight control diet fads and fallacies.

21. Explains the guidelines for safe weight loss and weight gain.

22. Describes the principles of body mass index computation.

23. Describes the signs, symptoms, and physical consequences of disordered eating.

24. Explains the referral system for individuals with disordered eating.

25. Describes the differences between saturated, unsaturated, and polyunsaturated fats and the effects of each on diet, performance, health care, heart disease, diabetes, and cancer.

26. Describes the signs, symptoms, and physiological effects of iron deficiency and anemia and identifies foods that enhance iron absorption and are high in iron.

27. Demonstrates how to determine the recommended daily allowances and identifies

common food sources of essential vitamins and minerals.

Psychomotor Domain

1. Accesses and uses information regarding the principles of fluid and electrolyte replacement.

2. Applies the principles of nutrition, including the roles of fluids and electrolytes, vitamins, minerals, and ergogenic aids, as they relate to the dietary and nutritional needs of athletes and others involved in physical activity.

3. Designs a pre-participation meal.

4. Includes the proper percentages of carbohydrates, protein, and fat in a diet based on age, gender, and type and level of physical activity.

Affective Domain

1. Appreciates the role of proper nutrition in the health care of athletes and others involved in physical activity.

2. Respects the various recognized position papers that discuss nutrition wellness.

3. Appreciates the long-term effects of disordered eating, bone density loss, and secondary amenorrhea on the skeletal health of the physically active.

4. Recognizes the need for and implements proper referral for eating disorders.

Nutritional Aspects of Injury and Illness
Athletic Training Clinical Proficiencies

Teaching Objective 1

The student will demonstrate the ability to design general nutrition programs for athletes and others involved in physical activity.

Specific Outcomes

1. The student will demonstrate the ability to access and recommend nutritional guidelines for the following:

    a) pre-participation meal
    b) weight loss
    c) weight gain
    d) fluid replacement

2. The student will demonstrate the ability to use the nutritional food pyramid.

3. The student will demonstrate the ability to access and assess the following nutritional intake values:

    a) RDA or equivalency
    b) protein intake
    c) fat intake
    d) carbohydrate intake
    e) vitamin intake
    f) mineral intake
    g) fluid intake

4. The student will demonstrate the ability to determine energy expenditure and caloric intake.

5. The student will demonstrate the ability to calculate the basal metabolic rate of energy expenditure.

6. Simulate intervention with an individual who has the signs and symptoms of disordered eating.

7. Identify proper referral sources for disordered eating.

Psychosocial Intervention and Referral

This content area is a collection of the knowledge, skills, and values that the entry-level certified athletic trainer must possess to recognize, intervene, and refer when appropriate, the sociocultural, mental, emotional, and physical behaviors of athletes and others involved in physical activity.

Cognitive Domain

1. Describes the current psychosocial and sociocultural issues and problems confronting athletic training and sports medicine and identifies their effects on athletes and others involved in physical activity.

2. Compares the psychosocial requirements of various sports activities to the readiness of the injured or ill individual to resume physical participation.

3. Understands the psychological and emotional responses (motivation, anxiety, apprehension) to trauma and forced physical inactivity as they relate to the rehabilitation and reconditioning process.

4. Describes the basic principles of mental preparation, relaxation and visualization techniques, general personality traits, associated trait anxiety, locus of control, and athlete and social environment interactions.

5. Provides health care information to patients, parents/guardians, athletic personnel, and others regarding the psychological and emotional well being of athletes and others involved in physical activity.

6. Disseminates information regarding the roles and functions of various community-based health care providers (sport psychologists, counselors, social workers).

7. Describes the accepted protocols that govern the referral of athletes and other physically active individuals to psychological, community health, or social services.

8. Describes the theories and techniques of interpersonal and cross-cultural communication among certified athletic trainers, athletes, athletic personnel, patients, administrators, health care professionals, parents/guardians, and others.

9. Employs the basic principles of counseling, including discussion, active listening, and resolution.

10. Describes the various strategies that certified athletic trainers may employ to avoid and resolve conflicts among superiors, peers, and subordinates.

11. Identifies the symptoms and clinical signs of common disordered eating (anorexia nervosa, bulimia) and the psychological and sociocultural factors associated with these disorders.

12. Identifies the psychological issues that relate to physically active women of childbearing years.

13. Identifies the medical and community-based resources that disseminate information regarding safe sexual activity and the health risk factors associated with sexually transmitted diseases.

14. Describes commonly abused substances (e.g., alcohol, tobacco, stimulants, nutritional supplements, steroids, marijuana, and narcotics) and their impact on an individual's health and physical performance.

15. Recognizes the signs and symptoms of drug abuse and the use of ergogenic aids and other substances.

16. Identifies the societal influences toward substance abuse in the athletic and physically active population.

17. Contrasts psychological and physical dependence, tolerance, and withdrawal syndromes that may be seen in individuals addicted to alcohol, prescription or nonprescription medications, and/or "street" drugs.

18. Describes the basic signs and symptoms of mental disorders (psychoses), emotional disorders (neuroses, depression), or personal/social conflict (family problems, academic or emotional stress, personal assault or abuse, sexual assault, sexual harassment) and the appropriate referral.

19. Identifies contemporary personal, school, and community health service agencies, such as community-based psychological and social support services.

20. Formulates a plan for appropriate psychological intervention and referral with all involved parties when confronted with a catastrophic event.

21. Describes the acceptance and grieving processes that follow a catastrophic event.

22. Identifies the stress-response model and how it may parallel an injury.

23. Defines seasonal affective disorder (SAD).

24. Cites the potential need for psychosocial intervention and referral when dealing with

populations requiring special consideration (e.g., those with exercise-induced asthma, diabetes, seizure disorders, drug allergies and interactions, or unilateral organs).

25. Describes the motivational techniques that the certified athletic trainer must use during injury rehabilitation and reconditioning.

Psychomotor Domain

1. Intervenes, when appropriate, with an individual with a suspected substance abuse problem.

2. Communicates with appropriate health care professionals in a confidential manner.

3. Uses appropriate community-based resources for psychosocial intervention.

4. Uses motivational techniques with athletes and others involved in physical activity.

5. Develops and implements stress reduction techniques for athletes and others involved in physical activity.

6. Develops and implements mental imagery techniques for athletes and others involved in physical activity.

Affective Domain

1. Accepts the professional, ethical, and legal parameters that define the proper role of the certified athletic trainer in providing health care information, intervention, and referral.

2. Accepts the responsibility to provide health care information, intervention, and referral consistent with the certified athletic trainer's professional training.

3. Recognizes the certified athletic trainer's role as a liaison between the physically active, athletic personnel, health care professionals, parents/guardians, and the public.

4. Accepts the need for appropriate interpersonal relationships between all of the parties involved with athletes and others involved in physical activity.

5. Accepts the moral and ethical responsibility to intervene in situations of suspected or known use and/or abuse of legal and illegal drugs and chemicals.

6. Accepts the moral and ethical responsibility to intervene in situations of mental,

emotional, and/or personal/social conflict.

7. Recognizes athletes and other physically active individuals as deserving of quality professional health care.

8. Accepts the individual's physical complaint(s) without personal bias or prejudice.

9. Respects the various social and cultural attitudes, beliefs, and values regarding health care practices when caring for patients.

10. Accepts the role of social support during the injury rehabilitation process.

Psychosocial Intervention and Referral
Athletic Training Clinical Proficiencies

Teaching Objective 1

The student will demonstrate the ability to intervene and make the referral to appropriate medical or allied medical professional.

Specific Outcomes

The student will

1. Simulate intervention with an individual who has a substance abuse problem and recommend appropriate referral

2. Simulate a confidential conversation with a health care professional concerning suspected substance abuse by an athlete or other physically active individual

3. Locate the available community-based resources for psychosocial intervention

Teaching Objective 2

The student will integrate motivational techniques into the rehabilitation program.

Specific Outcome

The student will

1. Simulate the following motivational techniques used during rehabilitation:

    a) verbal motivation
    b) visualization
    c) imagery
    d) desensitization

Health Care Administration

This content area is a collection of knowledge, skills, and values that the entry-level certified athletic trainer must possess to develop, administer, and manage a health care facility and associated venues that provide health care to athletes and others involved in physical activity.

Cognitive Domain

1. Describes the organization and administration of pre-participation examination and screening including, but not limited to, maintaining medical records, developing record keeping forms, scheduling personnel, and site utilization.

2. Lists the components of a medical record, such as permission to treat, emergency information, treatment documentation, and release of medical information.

3. Identifies the advantages and disadvantages associated with medical record keeping, including the issues of paperwork, electronic data, security, record keeping systems, and confidentiality.

4. Lists the current injury/illness surveillance and reporting systems such as, but not limited to, National Electronic Injury Surveillance System (NEISS), National Athletic Head and Neck Injury Registry, and the National Collegiate Athletic Association (NCAA).

5. Lists the various methods for recording patient information, and compares the strengths and weaknesses of each approach.

6. Identifies common human-resource policy and federal legislation regarding employment regarding, but not limited to, The Americans with Disabilities Act, Wage and Hour, Family Medical Leave Act, Family Educational Rights Privacy Act, Fair Labor Standards Act, Sexual Harassment, and the Equal Opportunity Employment Commission.

7. Describes the universal precautions mandated by the Occupational Safety and Health Administration (OSHA), and discusses how they apply to the athletic trainer.

8. Summarizes the function of accrediting agencies for health care facilities.

9. Identifies the process of obtaining state regulatory acts for athletic trainers, and becomes familiar with locally relevant statutes, rules, and regulations.

10. Explains the advantages and disadvantages of the various commercial software

programs and technologies used by a certified athletic trainer (statistical, educational, injury record keeping).

11. Explains the computer needs of an effectively operated athletic training facility.

12. Describes the various types of insurance policies (health maintenance organization [HMO], personal provider organization [PPO], fee-for-service) and the procedures for filing health care insurance claims.

13. Identifies the common insurance benefits and exclusions identified within health care insurance policies.

14. Uses accepted medical terminology and abbreviations (SOAP, CPT and HCFA coding).

15. Explains the components of the budgeting process, including purchasing, requisition, and bidding.

16. Illustrates the basic architectural considerations that relate to the design of a safe and efficient clinical practice setting.

17. Describes the duties of personnel management, including (1) recruitment and selection of employees, (2) retention of employees, (3) development of policies- and-procedures manual, and (4) employment performance evaluation.

18. Lists the components of a strategic plan that uses a model that helps in the development of a vision and mission statement and in the analysis of strengths, weaknesses, opportunities, and threats (SWOT).

19. Identifies the principles of recruiting, selecting, and employing physicians and other medical and allied health care personnel in the deployment of athletic health care services.

20. Interprets the role and function of nondiscriminatory and unbiased employment practices, which do not base decisions on race, gender, sexual orientation, disability, religion, national origin, or age.

21. Describes typical community-based emergency health care delivery plans, including communication and transportation systems.

22. Recognizes and appraises emergency action plans, which include on-site care, notification of emergency medical services (EMS), location of exits, and other relevant information, for the care of acutely injured or ill individuals.

23. Identifies the typical availability, capabilities, and policies of community-based emergency care facilities and community-based managed care systems.

24. Interprets the typical administrative policies and procedures that govern first aid and emergency care, such as those pertaining to parents/guardians, informed consent, media relations, incident reports, and appropriate record keeping.

25. Identifies the basic components of a comprehensive athletic injury emergency care plan, which include (1) personnel training, (2) equipment needs, (3) availability of emergency care facilities, (4) communication, (5) transportation, (6) activity or event coverage, and (7) record keeping.

26. Assembles an emergency action plan for all settings that includes on-site care, notification of EMS or appropriate personnel, and location of exit and evacuation routes.

27. Selects sideline emergency care supplies and equipment that are necessary and appropriate for the setting.

28. Summarizes basic legal concepts, such as, but not limited to, standard of care, scope of practice, liability, negligence, informed consent, and confidentiality, as they apply to a medical or allied health care practitioner's performance of his or her responsibilities.

29. Describes federal and state infection control regulations and guidelines as they pertain to the prevention, exposure, and control of infectious disease.

30. Lists the components of a comprehensive risk management plan that addresses the issues of security, fire, electrical and equipment safety, emergency preparedness, and hazardous chemicals.

31. Describes the necessary communication skills for interaction with physicians, allied health care providers, caretakers, and others who work closely with the certified athletic trainer.

32. Formulates a plan to promote the profession of athletic training and those services that certified athletic trainers perform in a variety of employment settings, such as high schools and colleges, professional and industrial settings, and community-based health care facilities.

33. Differentiates the roles and responsibilities of the certified athletic trainer and other medical and allied health personnel to provide care to athletes and others involved in physical activity.

34. Identifies contemporary personal and community health issues and the commonly available school health services, community health agencies, and community-based psychological and social support services.

35. Describes the role and function of various community-based medical, paramedical, and other health tare providers.

36. Describes the roles of various personnel in the organization of activity sessions and methods of instruction for athletes and others involved in physical activity. .

37. Explains the protocol that governs the referral of patients to medical or paramedical specialists and other health care providers.

38. Describes the basic components of organizing and coordinating a drug testing and screening program.

39. Locates and interprets current banned-drug lists that are published by various governing athletic associations (National Collegiate Athletic Association [NCAA], United States Olympic Committee [USOC], International Olympic Committee [IOC], etc).

40. Describes the continuing education process for certified athletic trainers as outlined by the NATABOC and the relationship between continuing education and state athletic training practice acts.

41. Identifies the current developments, missions, objectives, and professional activities of other allied health and medical organizations and professions.

42. Understands the NATA Code of Professional Practice and the NATABOC Standards of Professional Practice.

43. Understands how to locate Commission on the Accreditation of Allied Health Education Programs (CAAHEP) accreditation standards and recognizes their impact on the educational system.

44. Describes the relationship between the National Athletic Trainers' Association, Inc. (NATA), NATA Board of Certification, Inc./ National Organization for Competency Assurance (NATABOCINOCA), National Commission for Certifying Agencies (NCCA), and Joint Review Committee-Athletic Training/Commission on the Accreditation of Allied Health Education Programs (JRC-AT/CAAHEP).

45. Identifies the roles and responsibilities of allied health care personnel in providing services to athletes and others involved in physical activity.

46. Constructs a basic research design and statistical interpretation pertaining to the formulation and interpretation of a case study, outcome measurement, and literature review and interpretation.

Psychomotor Domain

1. Develops a plan/drawing of a safe and efficient health care facility.

2. Develops a risk management plan that addresses issues of liability reduction, security, fire, facility hazards, electrical and equipment safety, emergency preparedness, and hazardous chemicals (manufacturer safety data sheets [MSDS]).

3. Develops a policies-and-procedures manual for a health care facility that meets the guidelines set forth by the accrediting agencies.

4. Demonstrates the ability to access medical and health care information through electronic media.

5. Uses appropriate medical documentation to record injuries and illnesses (client encounters, history, progress notes, discharge summary, physician letters, treatment encounters).

6. Demonstrates the ability to organize a comprehensive patient-file management system that uses both paper and electronic media.

7. Develops an operational and capital budget based on a supply inventory and needs assessment.

8. Demonstrates the ability to prepare a sample design for scientific research in the areas of a case study, outcome measurement, and literature review.

Affective Domain

1. Appreciates the roles and responsibilities of medical and allied health care providers, and respects the systems that each provider works within.

2. Appreciates the roles and functions of various medical and paramedical specialties as well as their respective areas of expertise in the acute care of injuries and illnesses to athletes and others involved in physical activity.

3. Values the need for sideline emergency care supplies and equipment as deemed

necessary for all athletic training settings.

4. Appreciates the importance of an emergency action plan that is tailored for a specific venue or setting.

5. Accepts the value of a common medical language and terminology to communicate within and between the health professions.

6. Accepts the professional, ethical, and legal parameters that define the proper role of the certified athletic trainer in the administration and implementation of health care delivery systems.

7. Appreciates the roles and relationship between the NATA, NATABOCINOCA, NCCA, and JRC-AT/CAAHEP.

8. Recognizes and accepts the need for organizing and conducting health care programs for athletes and other physically active individuals on the basis of sound administrative policies and procedures.

9. Accepts the responsibility for completing the necessary paperwork and maintaining the records associated with the administration of health care programs.

10. Respects the roles and cooperation of medical personnel, administrators, and other staff members in the organization and administration of athletic training service programs.

11. Recognizes and accepts the importance of good public relations with the media (radio, TV, press), the general public, other medical and allied health care personnel, and legislators.

12. Recognizes the certified athletic trainer's role as a liaison between athletes, physically active individuals, caretakers, employers, physicians, coaches, other health care professionals, and any individual who may be involved with the care provided by the certified athletic trainer.

Health Care Administration
Athletic Training Clinical Proficiencies

Teaching Objective 1:

The student will demonstrate appropriate communication skills.

Specific Outcomes

1. The student will

    a) calm, reassure, and explain a potentially catastrophic injury to an injured adult or child, athletic personnel, and/or family member
    b) effectively communicate and work with physicians, emergency medical technicians (EMTs), and other members of the allied health care community and sports medicine team
    c) appropriately communicate with athletic personnel and family members
    d) use ethnic and cultural sensitivity in all aspects of communication
    e) communicate with diverse community populations

Teaching Objective 2:

The student will use contemporary multimedia, computer hardware, and software as related to the practice of athletic training.

Specific Outcomes

1. The student will access information and manage data using contemporary multimedia, computer equipment, and software. This should include, but not be limited to, use of the following:

    a) word processing software
    b) file management systems
    c) spreadsheets
    d) budgeting software
    e) injury tracking software
    f) the World Wide Web
    g) communication (e-mail)
    h) presentation software

Teaching Objective 3:

The student will demonstrate the ability to perform record keeping skills with sensitivity to patient confidentiality.

Specific Outcomes

1. The student will

    a) use standardized record keeping methods (e.g., SOAP, HIPS, HOPS)
    b) select and use injury, rehabilitation, referral, and insurance documentation
    c) use progress notes
    d) organize patient files to allow systematic storage and retrieval

Teaching Objective 4:

The student will demonstrate the ability to develop athletic training facilities and administrative plans.

Specific Outcomes

1. The student will demonstrate the ability to develop facility design plans that include, but are not limited to, the following components:

    a) basic floor plan design
    b) facility evacuation
    c) basic rehabilitation and treatment area plans

2. The student will demonstrate the ability to develop administrative plans that include but are not limited to, the following components:

    a) risk management
    b) developing policies and procedures
    c) developing budget (expendable and capital)
    d) addressing facility hazards

Teaching Objective 5:

The student will demonstrate the ability to prepare and interpret sample design for scientific research.

Specific Outcomes

1. The student will interpret the following basic literature:

    a) case study
    b) outcome measurement, including statistical interpretation
    c) literature review

Professional Development and Responsibilities

This content area is a collection of the knowledge, skills, and values that the entry-level certified athletic trainer must possess to understand professional responsibilities, avenues of professional development, and national and state regulatory agencies and standards in order to promote athletic training as a professional discipline and to educate athletes, students of athletic training, the general public, the physically active, and associated individuals.

Cognitive Domain

1. Compares and contrasts the role and function of state athletic training practice acts and registration, licensure, and certification agencies.

2. Explains the basic legislative processes for the implementation of practice acts for athletic trainers.

3. Defines the rationale for state regulations that govern the practice of athletic training.

4. Describes the consequences of violating federal and state regulatory acts.

5. Outlines the process of attaining and maintaining an athletic training professional credential.

6. Describes the current professional development requirements for the continuing education of certified athletic trainers.

7. Locates available, approved continuing education opportunities for certified athletic trainers.

8. Describes the role and function of the governing structures of the National Athletic Trainers' Association.

9. Differentiates the essential documents of the NATA, including, but not limited to, the Role Delineation Study, the Code of Ethics, IRC-AT Standards and Guidelines, Athletic Training Educational Competencies, and the Standards of Practice of the Profession.

10. Summarizes the position statements regarding the practice of athletic training (NATA, NCAA, National Association of Intercollegiate Athletics [NAIA], National Federation of State High School Associations, American College of Sports Medicine [ACSM], American Academy of Pediatrics [AAP], American Academy of Family Physicians [AAFP], American Orthopedic Society for Sports Medicine [AOSSMJ).

11. Locates and accesses the current activities and requirements for the professional preparation of the certified athletic trainer (NATA Education Council, IRC-AT, CAAHEP, NATABOC).

12. Able to access the professional objectives, scope of practice, and services of other health care providers.

13. Distinguishes that issues and concerns regarding the health care of athletes and others involved in physical activity (e.g., public relations, third-party payment, and managed care).

14. Properly interprets the role of the certified athletic trainer as a health care provider, and provides information regarding the role of the certified athletic trainer to athletes, the physically active, parents/guardians, athletic department personnel, and others.

15. Describes the availability of educational materials and programs in health-related subject matter areas (audiovisual aids, pamphlets, newsletters, computers, software, workshops, and seminars).

16. States the principles of planning and organizing workshops, seminars, and clinics in athletic training and sports medicine for health care personnel, administrators, coaches, and the general public.

Psychomotor Domain

1. Demonstrates the techniques and methods for disseminating injury prevention and health care information to health care professionals, athletes, athletic personnel, parents/guardians, and the general public (e.g., via team meetings, parents' nights, parent/teacher organizations [PTO] meetings, booster clubs, workshops, and seminars).

2. Demonstrates the ability to construct a resume.

3. Demonstrates the ability to access the policy-making and governing bodies that regulate the certified athletic trainer (state regulatory boards, NATA, NATABOC).

Affective Domain

1. Accepts the professional responsibility to satisfy certified athletic trainers' continuing education requirements.

2. Appreciates the need for and the process and benefits of athletic training regulatory acts (registration, licensure, certification).

3. Realizes that the state regulatory acts regarding the practice of athletic training vary from state to state.

4. Understands the consequences of noncompliance with regulatory athletic training practice acts.

5. Accepts the professional, historical, ethical, and organizational structures that define the proper roles and responsibilities of the certified athletic trainer in providing health care to athletes and others involved in physical activity.

6. Defends the moral and ethical responsibility to intervene in situations that conflict with NATA standards.

7. Accepts the function of professional organization position statements that relate to athletic training practice.

8. Advocates the NATA as an allied health professional organization dedicated to the care of athletes and others involved in physical activity.

9. Respects the role, and responsibilities of the other health care professions.

10. Appreciates the dynamic nature of issues and concerns as they relate to the health care of athletes and others involved in physical activity.

11. Defends the responsibility to interpret and promote athletic training as a professional discipline among allied-health professional groups and the general public.

12. Accepts the responsibility to enhance the professional growth of athletic training students, colleagues, and peers through a continual sharing of knowledge skills, values, and professional recognition.

Professional Development and Responsibilities
Athletic Training Clinical Proficiencies

Teaching Objective 1

The student will demonstrate the ability to disseminate injury prevention and health care information.

Specific Outcomes

1. The student will develop a presentation outline for an athletic training topic. The outline may include, but is not limited to, the following audiences:

    a) peer athletic trainers
    b) physicians
    c) parents
    d) athletic personnel
    e) general public
    f) athletes and others involved in physical activity

2. The student will develop a professional resume.

APPENDIX B

NATA Permission Letter (Emailed Version)

Read Message

From: "Richard Rogers" richr@nata.org
To: <treesapatc@netzero.net

Subject: RE: NATA Permission
Date: Wed, 25 Feb 2004 14:57:43-0600

Amber,

The NATA grants you permission to use the 1999 edition of the NATA Athletic Training Educational Competencies as an appendix in your master's thesis. We wish you the best of luck in this endeavor.

Richard Rogers
NATA Governmental Affairs Manager

-----Original Message-----
From: treesapatc@netzero.net [mailto:treesapatc@netzero.net]
Sent: Tuesday, February 24, 2004 11:04 AM
To: Richard Rogers
Subject: NATA Permission

Dear Mr. Rogers,

Thank you for offering to take the initiative to find who is responsible for this matter. I apologize for my delay in sending you the appropriate information. Attached is my letter of explanation and request. Please feel free to contact me at any time if necessary. I hope to hear from you soon.

Amber N. Northam ATC

APPENDIX C

Athletic Injuries

The Foot

Interdigital neuroma

Metatarsal dislocation

Metatarsal stress fracture

Metatarsophalangeal joint instability

Midfoot sprain

Navicular stress fracture

Plantar fasciitis

Plantar wart

Sesamoiditis

Talar dome fracture

The Ankle and Lower Leg

Achilles tendon rupture

Anterior tibialis tendonitis

Compound tibiofibular fracture

Inversion ankle sprain

Medial tibial stress syndrome

Posterior tibial tendonitis

Syndesmotic ankle sprain

The Knee

Femoral condyle fracture

Iliotibial band syndrome

Lateral collateral ligament sprain

Medial capsule sprain

Osgood-Schlatter disease

Patellar contusion

Patellar dislocation

Patellar facet inflammation

Patellar tendonitis

Pes anserine tendonitis

Popliteus strain

Tibial plateau fracture

The Thigh, Hip, Groin, and Pelvis

Gluteus Medius Strain

Hip pointer

Legg-Calve-Perthes disease

Quadriceps contusion/Myositis ossificans

Trochanteric bursitis/Snapping hip syndrome

The Spine

Back contusion

Brachial Plexus Neuropraxia (Stinger/Burner)

Cervical fracture/Cervical dislocation

Lumbar nerve root contusion

Sciatica/Herniated disc

Spondylolysis/Spondylolisthesis

Thoracic spine injury/cardiac contusion

The Thorax

Appendicitis

Costochondral separation

Pneumothorax/Tension pneumothorax

Scrotal infection

Spleen injury

Sternum fracture

The Head and Face

Concussion

Facial laceration

Hematomas auris

Hyphema

Mandible fracture

Orbital blow-out

Retinal detachment

Subdural hematoma

Throat contusion

Tooth fracture

Traumatic javelin injury

The Shoulder

Acromioclavicular sprain

Biceps brachii rupture (short head)

Bicipital tenosynovitis

Clavicular fracture

Humeral shaft fracture

Multi-directional instability

Shoulder impingement

The Elbow and Forearm

Brachialis Strain

Median nerve neuritis

Olecranon bursitis

Osteochondritis dissecans

Radial nerve neuritis

Radial stress fracture

Ulnar Collateral Ligament Sprain

Ulnar Dislocation

Ulnar stress fracture

Wrist and Hand

Colles fracture

De Quervain's syndrome

Hamate fracture

Mallet finger

Metacarpal fracture

Metacarpophalangeal sprain

Proximal interphalangeal joint dislocation/Volar plate rupture

Scaphoid fracture

Illness

Common cold/flu

Mononucleosis

Skin

Ringworm

Prevention

Blood Sugar Imbalance

Eating Disorder

Heat Illness

Hypothyroidism

Testicular cancer

Weight loss with wrestlers and dehydration

Administrative

Administrative

Ethical

Communication

Modalities

Cold

Heat

Interferential

Low Level Laser

TENS

Ultrasound

APPENDIX D

IRB Approval

San José State
UNIVERSITY

Office of the Academic Vice President
Academic Vice President Graduate Studies and Research
One Washington Square
San José, CA 95192-0025
Voice: 408-283-7500
Fax: 408-924-2477
E-mail: gradstudies@sjsu.edu
http://www.sjsu.edu

To: Amber Northam
571 S. 7th St., #6
San Jose, CA 95112

From: Pam Stacks,
Interim AVP, Graduate Studies & Research

Date: March 27, 2004

The Human Subjects-Institutional Review Board has approved your request to use human subjects in the study entitled:

"Athletic Training Education: Critical Thinking through Injury Case Scenarios."

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to all data that may be collected from the subjects. The approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Pam Stacks, Ph.D. immediately. Injury includes but is not limited to bodily harm, psychological trauma, and release of potentially damaging personal information. This approval for the human subjects portion of your project is in effect for one year, and data collection beyond March 27, 2005 requires an extension request.

Please also be advised that all subjects need to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate, or withdrawal will not affect any services that the subject is receiving or will receive at the institution in which the research is being conducted.

If you have any questions, please contact me at (408) 924-2480.

cc: Leamor Kahanov

APPENDIX E

Informed Consent

San José State
UNIVERSITY

College of Applied Sciences and Arts
Department of Human Performance
One Washington Square
San José, CA 95192-0054
Voice: 408-924-3010
Fax: 408-924-3053

Agreement to Participate in Research

Responsible Investigator: Amber N. Northam, ATC

Title of Protocol: Athletic Training Education: Critical Thinking Through Sports Medicine Case Scenarios

1. You have been asked to participate in a research project to compile athletic training case studies for educational use.

2. You will be interviewed regarding case studies encountered during your career.

3. There are no risks anticipated to participants of this research project.

4. Participants may request their individual responses to any of their case studies after the completion of the project.

5. Although the results of this project may be published, no information that could identify you will be included.

6. There is no compensation for participation in this study.

7. Questions about this research may be addressed to Amber N. Northam, ATC at 408-286-0676. Dr. Leamor Kahanov, Professor and Faculty Advisor, Department of Human Performance, also may be reached for questions at 408-924-3040. Complaints about the research may be presented to Dr. Gregory Payne, Department Chair, Department of Human Performance, 408-924-3010. Questions about research subjects' rights or research-related injury may be presented to Pam Stacks, Interim Associate Vice President, Graduate Studies and Research, at 408-924-2480.

8. No service of any kind, to which you are otherwise entitled, will be lost or jeopardized if you choose to "not participate" in the study.

9. Your consent is being given voluntarily. You may refuse to participate in the entire study or in any part of the study. If you decide to participate in the study, you are free to withdraw at any time without any negative effect on your relations with San Jose State University or with any other participating institutions or agencies.

_____

Signature Date

_____

Investigator's Signature Date

APPENDIX F

Interview Questionnaire

Interview Questionnaire

Age of participant_____

Number of years certified_____

1. Give an example of an upper extremity case study experienced during your career.

2. Give an example of a lower extremity case study experienced during your career.

APPENDIX G

Sports Medicine Case Scenarios Student Manual

INTRODUCTION

The following is a set of 100 athletic training case scenarios, the majority of which happened to various certified athletic trainers. The purpose of the case scenarios is to offer you, the athletic training student, familiarity with athletic injuries or situations that other athletic trainers have experienced. These experiences may be a rare situation that you may never experience in a career, or they may be of a more common occurrence. The goal of the cases is to familiarize you with the situation presented so you become more comfortable with correct and incorrect management techniques. No one certified athletic trainer has seen everything, but every athletic trainer, whether certified or a student, has seen something extraordinary. The sharing of those experiences with you will help to strengthen your athletic training skills for the future.

The cases are grouped into the type of situation each case represents: emergency care, evaluation and rehabilitation, modalities and administration. The emergency care groupings are injuries that either are emergency situations or situations that need to be evaluated as an emergency due to the range of possible pathologies. The group on evaluation and rehabilitation are integrated because some cases involve various rehabilitation questions about the given case. The administration section deals with cases regarding ethical considerations, guidelines, and communication. The group on modalities incorporates your knowledge of the appropriateness of the use of a given modality, as well as the specific parameters that would be used. All cases are in alphabetical order, within their given group.

The format presented in the student book only includes the beginning scenario and the questions that follow, while presenting more information for you as necessary. The instructors' book includes the suggested answers.

TABLE OF CONTENTS

GLOSSARY OF ABBREVIATIONS

ABCs	Airway, Breathing, Circulation
AC	Acromioclavicular
ACL	Anterior Cruciate Ligament
ADLs	Activities of Daily Living
AROM	Active Range of Motion
ATF	Anterior Talofibular Ligament
ATF	Athletic Training Room
BPM	Beats Per Minute
CF	Calcaneofibular Ligament
CWP	Cold Whirlpool
DIP	Distal Interphalangeal joint
ER	External Rotation
HP	Hot Pack
IR	Internal Rotation
ITB	Iliotibial Band
LCL	Lateral Collateral Ligament
LOC	Level of Consciousness
MCL	Medial Collateral Ligament
MCP	Metacarpophalangeal Joint
MHZ	Megahurtz
MMT	Manual Muscle Testing
MT	Metatarsal
MTP	Metatarsophalangeal
MTSS	Medial TIbial Stress Syndrome
NSAIDs	Non-Steroidal Anti-Inflammatory Drugs
NWB	Non-Weight Bearing
PFD	Patellofemoral Dysfunction
PIP	Proximal Interphalangeal Joint
PROM	Passive Range of Motion
ROM	Range of Motion
RROM	Resistive Range of Motion
SC	Sternoclavicular
SI	Sacroiliac
SLAP	Superior Labrum, Anterior Posterior
STM	Soft Tissue Mobilization
TFCC	Triangular Fibrocartilage Complex
TFL	Tensor Fascia Latae
TTP	Tender to Palpation
US	Ultrasound
VMO	Vastus Medialis Oblique
WNL	Within Normal Limits
WWP	Warm Whirl Pool

EMERGENCY CARE

Internal Organ Injury

One of your hammer throwers comes into the athletic training room one afternoon complaining of possible food poisoning from breakfast. About 5 hours earlier, he had a stomach ache and went to the health center where he was given antacids. Now his pain is worse and he feels hot and nauseous. He indicates his right lower gut as the site of pain. He has gotten some relief from lying on his couch with his legs propped up on pillows.

1) What structures could be causing the pain?

2) How do you evaluate this complaint?

3) Rebound test is positive and his abdomen feels distended at McBurney's point. Where is McBurney's point?

4) What do you suspect is the problem and how do you handle the situation?

5) If he requires surgery, can it be performed right away? Why or why not?

Neck Injury

During a high school football game, an athlete comes off the field, walking slowly and walks directly to you. He looks dazed and scared. He tells you that he feels like his head is going to fall off.

1) What is your first course of action?

2) Why is your response in #1 your first course of action? What injury do you suspect?

3) What is your next course of action?

4) What other immediate actions need to take place?

5) How should your demeanor outwardly be displayed? Why? What will you tell the athlete is occurring?

6) What other steps should be taken while you await the paramedics?

7) He indicates that his parents are not at the game. They are home. How do you handle that situation?

8) What other steps should be taken while you wait?

9) Explain how you perform that task.

10) Full sensation is noted in all areas. What does that indicate?

11) When the paramedics arrive, do you relinquish your position at the athlete's head? Why, or why not?

Shoulder Injury

During a high school wrestling tournament, you are called to attend to an injury on a mat. You did not see the injury. When you arrive at the mat, there are people standing around an athlete, who is also standing.

1) How do you initiate your evaluation? Do you ask bystander what is occurring?

2) The athlete explains that he had been picked up by his opponent, and taken down to the mat, landing on his shoulder. He immediately felt a "pop" in his shoulder, almost like his shoulder started to pop out, but popped back. He has never injured his shoulder before. He is scared to move his arm because it hurts, and he is splinting his right arm to his body. What is your next step in evaluation? What do you suspect at this time?

3) Observation findings are not significant. He had pulled his singlet down to his waist, making bi-lateral comparison easier. Due to his body type, only the proximal 1/3 of his clavicle is well defined. Both clavicles are even. There is no deformity in his shoulder. What is your next step in evaluation?

4) With palpation, do you palpate the suspected trauma area first, or do you verify the integrity of the surrounding structures first? Why?

5) Based upon the information offered by the athlete and your current findings, what pathology(s) do you suspect?

6) Palpation of the SC joint is negative. Continuing laterally along the clavicle, the middle 1/3 of the clavicle feels mushy and elicits pain in the athlete. Does this indicate anything significant, or is this a normal finding?

7) Do you continue your evaluation? If not, what is your next course of action? If so, how do you continue your evaluation?

Arm Injury

During a junior high track meet, while observing the high jump pit, you watch as a jumper misjudges his space, and after clearing the bar, falls off the pit onto the rubberized track. As he falls, he puts out his hand to catch himself. You hear him cry out in pain as he collapses on his arm.

1) What is your first course of action?

2) What is your next course of action?

3) He says his arm hurts. He then begins to get hysterical after looking at his arm. Observation shows a gross deformity. His wrist is displaced dorsally in relation to his forearm. How do you handle the situation?

4) Palpation reveals that the distal aspect of the radius is also displaced dorsally. Discontinuity is also noted over the distal ulna. What is your next course of action?

5) What type of splinting materials would you use and not use, why?

6) What is your next course of action?

7) Why is #6 a vital step?

8) As you ask if his parents are at the meet, they approach you. What do you tell them?

9) They are comfortable driving him. What type of fracture do you suspect? Describe the fracture.

Lower Leg injury

At football practice, during a walk-through, a recruit trying to impress the coaches administered a hit to the starting center. The recruit led with his head, hitting the center on the lateral aspect of the leg, distal to the knee. The center collapsed on the ground, screaming, while blood spurted from his leg.

1) What is your first course of action?

2) Observation reveals the tibia has punctured through the skin. What other steps need to be taken to control the situation?

3) How is the femoral artery located?

4) While waiting for transport, what other medical conditions need to be considered?

5) What are the warning signs for this condition?

6) Once the paramedics arrive and prepare to transport the athlete, should the person applying pressure to the spurting blood vessels let go for any reason? Why or why not?

Head Injury

A high school football player takes a hit during practice. You are too far away to see exactly what happened, but the other players pile onto the tackled athlete. After being helped to his feet by a teammate, he stands there, looking around. He does not join the huddle. His coach calls him off the field to yell at him for being lazy. You approach the athlete to make sure he is okay. He says he is fine.

1) Do you perform an evaluation? If so, why and what do you suspect?

2) What is the initial test during the evaluation that you perform?

3) Evaluation reveals all nerves are in-tact. The athlete is oriented to time and place, but when you ask him what his name is, his response is, "Pee-Wee Herman". How do you manage the situation?

4) Thirty minutes later, your re-evaluation indicates no signs or symptoms. What injury may your athlete have incurred?

5) If this athlete does have the injury described in question #4, should he be restricted from participation? How do you assess when the athlete may return?

6) Should this athlete be referred to a physician? Why or why not?

Face Injury

During a baseball game a pitcher released a fastball, the ball was then hit and lined back to the pitcher, striking him in the face, specifically the orbit of his eye. He fell backwards on the mound and lay unmoving on the ground.

1) When you get to the mound, what is your initial evaluation?

2) Why would you stabilize his c-spine?

3) The athlete is unresponsive to verbal stimuli. His eyes are closed, with his right eye immediately swollen, and he has not moved. What do you do at this point?

4) The athlete is breathing and his pulse is rapid and weak. Paramedics are on their way. While you are waiting, what course of action should you take?

5) After about a minute, the athlete begins to stir and becomes responsive. Do you release c-spine stabilization?

6) He asks what happened and complains of pain in his head. He tries to open his eyes and states that things look weird. When you ask him what he means by that, he says it was like somebody dropped a curtain before his eyes. What injury do you suspect?

Knee Injury

During a defensive line drill at high school football practice, a tackled player falls into another player, hitting him from the posterior lateral side, causing him to fall prone. He is unable to get back on his feet.

1) When you get to him, how do you initiate your evaluation?

2) He says his foot was planted when he was hit and he felt a "pop". Now he has unbearable pain in his knee. He is completely unwilling to move it or bear any weight. How do you continue your evaluation?

3) His knee is immediately swollen, resembling a grapefruit. It is very hot to touch. What is your next step in evaluation?

4) He is only point tender over the medial femoral condyle. Do you remove him from the field? Why or why not?

5) What is your next step in evaluation?

6) After convincing him to relax and give you his leg, you perform your special tests. Varus and Valgus stress testing produces pain, as does Lachman's. Anterior drawer produces pain, but no laxity. All the pain he feels is around his medial femoral condyle. What other tests would you perform?

7) McMurray's produces immense pain with medial stress, as does forced flexion or hyper-extension bounce test. What pathology do you suspect?

8) How do you manage the situation?

9) After physician evaluation, the athlete is diagnosed with a medial femoral condyle fracture. Knowing that, was your evaluation appropriate, especially in regards to questions #5 and #6? Why?

Arm Injury

During a soccer game, two girls went up to head a soccer ball and collided in the air. One of the girls had her legs knocked out from under her, so when she fell, she came down on her side, landing on her bent elbow. She immediately cried out in pain and lay writhing on the field.

1) What injures do you suspect as you run out onto the field?

2) What is your first course of action?

3) When you reach her, she is lying on her back, with her left arm stretched out to the side. Her arm is obviously deformed. She is crying. How do you manage the situation?

4) Her shoulder is abducted approximately 70 degrees. Her elbow is flexed approximately 30 degrees, her hand is supinated. The deformity appears to be at her humerus, which appears shorter, with a lump in the mid-shaft. What is your next course of action?

5) Palpation confirms your observation findings. A radial pulse cannot be located on her left arm. However, her right arm reveals a rapid and strong pulse (85 bpm). What does this information indicate?

6) What is your next course of action?

7) What is your next course of action?

8) What precautions should be taken in this circumstance?

9) While you await transportation, how do you manage the situation?

Face injury

During a game, a baseball pitcher released a fastball, which was lined back to him, hitting his right eye. He is now lying supine behind the mound, in pain, with his hands covering his face. You calm down the athlete and remove his hands so that you can see his face. The athlete is hesitant to remove his hands, but once he does, you see a red rim around his orbit where the ball struck. The athlete's eyes are closed.

1) How do you initiate your evaluation?

2) The athlete has no head injury from your evaluation. The athlete opens his eye, and the sclera appears bloodshot. Upon closer inspection, the inferior 1/5 of the iris is not visible due to blood. What medical condition do you suspect?

3) Do you continue or terminate your evaluation? Why?

4) What is your next action?

Back Injury

At a track and field invitational, you watch as your decathlete waits, squatting by the start/finish line for a race to begin so that he can cross the track. He is squatting close to the left side of the shot put ring when you hear people yelling "heads-up". You watch as he does not move, but is suddenly hit with a 16 pound shot in his low back. He fells backwards onto his back with his hips and knees flexed. He does not move.

1) What is your first course of action?

2) He is conscious and recognizes you right away. He tells you he knows not to move. He asks if he was really hit with a shot because he really hurts. What is your next course of action?

3) He has never injured his back. Last year he had bilateral inguinal hernia surgery. He is not taking any medication. His pulse is rapid and steady at 90bpm, respirations are 25 breaths per minute, and blood pressure is 100/70. When asked, he can move his toes and feet. Palpation of the lumbar spine reveals all vertebrae are intact, with full sensation felt by the athlete. What is your next step in evaluation?

4) Palpation of the kidneys is negative. Palpation of the SI joint and iliac crest are negative. Palpation of the right lumbar soft tissue musculature is painful and firm to the touch. How do you continue your evaluation?

5) List the areas to be examined for each spinal level.

6) Do you move this athlete before the paramedics arrive? Why or why not?

7) What injuries do you suspect?

8) Would you have expected this athlete to be in danger on the left side of the shot-put ring, why?

Back Injury

During a high school football scrimmage, a running back gets speared in the low back when he is tackled. He immediately drops to his stomach and does not move.

1) What is your first course of action?

2) As you approach, he crawls/drags himself to the huddle, where a teammate pulls him up, but he immediately collapses in a prone position as you reach him. He is conscious, breathing, and asking for help. What is your first step with this athlete?

3) He reports that after he was hit, he could not move or feel his legs. But right away, he regained feeling in his right leg, which was why he tried to reach the huddle. He says he cannot feel his left leg. What is your next course of action?

4) How do you continue your evaluation?

5) He can move his left leg. However, he cannot feel you touching his leg. While waiting for the paramedics, what course of action should you take to stabilize this athlete?

6) How do you continue your evaluation?

7) Upon palpation of his lumbar spine, he is not point tender along the spinous processes, but his left paraspinals are rock hard and painful. The paramedics have not arrived yet, what is your next step in evaluation?

8) What spinal level do you initiate your testing at, and where would you need to touch the athlete?

9) What is the next level and location?

10) Next level and location?

11) Next level and location?

12) Next level and location?

13) Next level and location?

Face Injury

During a softball game, a pitch was lined back at the pitcher. She does not have time to react, and the ball hits her in her mouth. She doubles over in pain.

1) What is your first course of action? Do you have to wait for the umpire to let you on the field?

2) She is stunned that she was hit and starts anxiously pacing. How do you initiate your evaluation?

3) Teeth number 21, 22, and 31 are all broken. Her gums are bleeding. The left side of her lips and chin are red from being hit. Is your primary evaluation complete? If so, what is your next course of action? If not, what is needed for completion?

4) Once she is on the sidelines, what is your next step in evaluation?

5) Palpation of her broken teeth produces sensitivity in those teeth and gums. All surrounding teeth are stable. Palpation of the left mandible produces pain, and a possible defect area is noted. How do you continue your evaluation? What do you suspect?

6) She is able to open and close her jaw. However, it is painful and she cannot open it her usual width. When she closes her jaw, her front teeth fail to line up evenly. What is your next step in evaluation? Are there any tests you would specifically use to differentially diagnose the injuries you suspect in #5?

7) The Tongue Blade test is positive. What demonstrates a positive Tongue Blade test finding?

8) What pathology do you suspect?

9) What is your next course of action?

Foot Injury

During practice, a pole vaulter came down on the side of the pit, almost missing the pit completely. His right leg did miss the pit, his foot contacting the ground. He is lying on the ground with his hip abducted in external rotation, his knee bent, and his foot dorsiflexed.

1) Of all possible injuries he may have incurred, which are the most traumatic that you would need to rule out immediately?

2) How do you evaluate this athlete to differentially diagnose the conditions indicated above?

3) He complains of pain in his foot and ankle. How do you proceed with your evaluation?

4) His foot is obviously deformed on the lateral aspect, resembling a dinner fork deformity of the wrist. What pathologies do you suspect?

5) Upon closer inspection, his fifth metatarsal appears to be on top of his fourth metatarsal. Do you continue your evaluation? If not, how do you manage this situation?

6) The athlete is crying out irritably in immense pain. His face looks ashen and he tells you he thinks he is going to throw up. His breathing is shallow. What do you now suspect with this athlete? Does this change your management protocol?

Head Injury

During a men's soccer game, two players compete for a header, and collide heads. Both players collapse to the ground and lay unmoving.

1) What is your first course of action?

2) As you approach the players, one sits up and says he is okay. The other remains lying on his left side, with his back to you. What is your next course of action?

3) When you reach him, what are you looking for in your assessment?

4) He is verbally responsive as you talk to him. How do you continue your evaluation?

5) His face is covered in blood. He says he hit the other guy's head when he went for the header. His head hurts. He has no c-spine pain upon palpation, no deficits are felt and he has full sensation and motor control in his hands and arms. What does that indicate?

6) How do you continue your evaluation?

7) Questioning reveals full cognitive functioning. The origin of the blood is a 1 inch laceration located superior to his right eyebrow, on the lateral aspect. What is your next course of action?

8) Once he is on the sidelines, is your evaluation complete? If so, why? If not, how do you continue?

9) Observation reveals the zygomatic arch is depressed on his right side. Is that significant? If so, why? What might that implicate?

10) Is there a next step to your evaluation? If so, what is that step?

11) He indicates that his peripheral is fuzzy. Both his eyes track the movements of your finger. However, his right eye is unable to look all the way upward as the left eye does. Does that confirm or change your suspicions?

12) What injury do you suspect?

13) What is your next course of action?

Knee Injury

During a soccer game, you watch one of the male players plant off his right leg to pivot to the left, when he drops to the ground crying out in pain. He rolls onto his left side, holding his right lower leg in his hands.

1) From where you sit, what are the injuries you think he may have sustained?

2) What is your first course of action?

3) He is crying in pain. How do you handle the situation?

4) He says it is his knee. He went to pivot, and he felt a pop. Now his knee really hurts, and it looks funny too. What is your next course of action, why?

5) His knee is flexed approximately 45 degrees, and does look deformed. His knee and surrounding area appears swollen, specifically around the lateral aspect of his knee. The femoral trochlear groove is well defined. How do you continue your evaluation, why?

6) The femur and tibia are intact. You are able to palpate the femoral trochlear groove, which is not comfortable for the athlete. There is a hard mass felt on the lateral aspect of the knee. What pathology do you suspect?

7) What is the most injured structure with the pathology listed in #5?

8) What is the on-field management of the condition listed in #5?

Finger Injury

During women's basketball practice, you, the athletic trainer, observe one of the guards receive a chest pass from across court. Instead of catching the ball into her chest, the ball reflects off her as she doubles over, apparently in pain. As she starts to scream about her finger, you approach her. She holds her hands together and frantically jumps around saying, "It's my finger again." You ask her what she means by "again", and she says she has dislocated this finger before. When you ask her what it looked like before, she says her little finger made an "L" out to the side. She declares she does not want anybody to touch her finger.

1) How do you manage the situation?

2) After convincing the athlete that she needs to let you look at her finger, she continues to hold her hands together, but turns so that you can see, but not touch, her right little finger. Her finger is obviously deformed, but in the correct linear alignment of the phalanges. Her DIP is flexed and her middle phalanx appears to be on top of her proximal phalanx. What are the possible structures damaged?

3) What is your next course of action?

4) X-rays were negative, and after reduction of the PIP, the finger looks "normal". What do you think the assessment is and how do you treat that injury?

Internal Organ Injury

During a junior varsity football game, one of your wide receivers is tackled from behind, landing on the football. He does not get up. When you get to him, he is alert, and is trying to catch his breath. He says he had the wind knocked out of him. His breathing has normalized from 20 breaths a minute to 15 breaths a minute and his anxiety levels have decreased. You walk him off the field.

1) When can this athlete return to play?

2) Your evaluation produces no significant findings, except that his breathing is rapid and shallow. What is your next course of action?

3) His blood pressure is 100/70 and his pulse is rapid and weak at 80bpm. His skin looks pale. What do you do to manage the situation?

4) A couple minutes later, he is complaining that he is nauseous and has pain in his left shoulder. What is your next course of action?

5) His blood pressure is now 80/60 with rapid, weak respirations and pulse. His skin feels clammy. His upper left quadrant feels distended and his skin looks white as he vomits on the ground. What do you do to control the situation?

6) He says his mom is at the game. You do not know who she is, but he gives you her cell phone number. You call her and ask her to come down on the field. When she arrives, you explain her son's condition. She wants to take him to the hospital herself, instead of waiting for an ambulance. Do you let her take him? Why or why not?

7) What pathology do you suspect?

Thorax Injury

During a summer women's basketball camp, while setting a screen, the opponent's shoulder drove into your athlete's sternum. She fell to the floor, displaying dypsnea.

1) When you get to her, what is your first course of action?

2) She is alert and reactive, but has trouble breathing. You initiate rhythmic breathing, and she calms down and appears better. Upon sitting up, her dypsnea returns with sharp pain in her chest. How do you manage the situation?

3) Her pulse is 80bpm with rapid, shallow breathing while her blood pressure is 120/70. She is panicked because she cannot catch her breath and breathing is painful. Her sternum is painful to touch. Her costal cartilage is tender to palpation, but not nearly as painful as her sternum. Her SC joints are not tender and are symmetrical. What is your next course of action?

4) When she remains supine and calm with even breathing, her pain lessens and is manageable. Her pulse is steady at 75bpm with her blood pressure staying around 120/70. What possible injuries could she have?

Head Injury

On Thursday, while you are preparing for your JV home football game, one of your athletes approaches you complaining of neck tightness.

1) How do you initiate your evaluation?

2) He reports that Monday in practice he took a hit to his head by another helmet. He went home that night with a head-ache. The next day, he still had his head-ache, but his neck was sore too. When you ask him why he never told anybody, he said he thought it was no big deal. He then stayed home from school yesterday (Wednesday) because of the head-ache. Today his head-ache is gone, but his neck is tight. He wants you to work on his neck before he suits up. What is your course of action?

3) When he returns on Monday, he has a letter of clearance from his physician. What is your next course of action?

4) Today he is symptom free. He has no head-ache or neck pain. Cranial nerve testing is negative. He has full strength and ROM. You allow him to practice. He is fine through practice that day, Tuesday, and Wednesday. He plays in Thursday's game. During the 3rd quarter, he approaches you complaining of weakness in his legs, light headedness and inability to concentrate. It is 85 degrees outside, and he is wearing long black sleeves under his pads. What do you do to manage the situation?

5) How do you continue your evaluation?

6) He does not remember any traumatic event on the field. His neurologic exam is normal. He is coherent without memory loss or balance problems. As his condition stays the same, what is your next course of action?

7) You call his dad's cell phone, and he arrives. He decides he wants to transport his son to the hospital, but there is no need for an ambulance. He is stable, although something does not seem right about his condition. What conditions do you suspect?

Thorax Injury

During a high school football game the quarterback released the ball, and while his arm was still in the air, was immediately hit in the ribs by a helmet. He got up from the ground and walked himself off the field. On the sidelines, he complained of not being able to catch his breath.

1) How do you initiate your evaluation?

2) What is your next step in evaluation?

3) No rib deformity is felt, but he is TTP where he was hit. What is your next step?

4) His pulse is rapid and strong at 80 bpm. His blood pressure is 120/70. His skin is normal. His breathing is normal, but labored. He is not wheezing. His posture is guarded, but he can sit up straight and move his arms. What is your next step in evaluation?

5) Rib compression is positive. What injury do you suspect?

6) Is your evaluation over? If not, what would your next step be? What else might you suspect?

7) His lung sounds are absent in the right lower lobe. How does this information affect your suspected pathology?

8) What is your next step in evaluation?

9) There has been no change. He appears to be stable. How do you proceed?

Thorax Injury

At the cycling velodrome during week-end competition, an individual rider starts for his 1 kilometer race. He stands out of the saddle, accelerating as fast as he can, when you see him lose his cadence and fall forward onto the handlebars of the bike. You know he will crash, as "track bikes" have no brakes, a fixed gear and cannot free wheel. You expect him to fall to the right and slide down the track, as all crashes do. However, he flips over to the left onto the asphalt, landing on the left side of his body. He immediately starts screaming.

1) Did he fall in a relatively good or bad manner and why? Is there anything about the velodrome or equipment that you, as an athletic trainer, need to know or understand that could contribute to the severity of injuries sustained while on the velodrome?

2) What is your first course of action?

3) When you get to him, he is lying on his stomach with his left arm underneath his chest. He is moaning in pain. You instruct him not to move and he argues because his position is uncomfortable. How do you handle the situation?

4) What possible injuries do you suspect at this time?

5) With all the injuries listed in #3 in mind, how do you initiate your evaluation?

6) His helmet is off his head, with the left rear side broken into pieces. He can squeeze your hands and wiggle his feet. He has full sensation in his arms and legs. For each spinal level tested, where would you palpate him for sensory testing?

7) He continues to complain about pain in his chest and he wants to move. Do you move him yet and why or why not?

8) During palpation of his spinous processes, he screams in pain when you touch around T7. What is your next course of action?

9) He complains that he is having trouble breathing. Do you allow him to move and why?

10) Going back to his broken helmet, is their any course of action you take regarding a possible head injury while you await the paramedics?

11) He says he removed his helmet as soon as he was on the ground because he "did not need it anymore". While you wait for the paramedics, is their any other information you should gather?

12) He indicates that while he was accelerating out of the saddle, his chain came off during a powerful down-stroke of his left foot. That caused his momentum to fall forward, where the left side of his chest hit the aerobar pad on his handlebars. He then fell to the left, landing on left shoulder/upper back. What possible injuries do you suspect?

Neck Injury

During a baseball game, an infield grounder took a bad hop, came up and hit the second baseman in the throat. He is sitting on the ground when you get to him.

1) What are the initial life threatening injuries you think he might have as you run out onto the field?

2) What is your first course of action?

3) He is breathing, but displays dyspnia, wheezing, and a hoarse voice when he tries to talk. What other symptoms do you need to observe and evaluate? Why are these symptoms important?

4) Swallowing is uncomfortable, but with effort he is able to swallow. His carotid pulse is found and is rapid but steady. What is your next evaluative step?

5) His throat is red and a hematoma is becoming evident over his thyroid and cricoid cartilage. He is TTP over both the thyroid and cricoid cartilage. Why are those structures important?

6) The athlete is beginning to become agitated as he tries to take deep breaths. What do you tell him?

7) His breathing is more controlled, and he is calmer now. How do you continue your evaluation?

8) Head evaluation does not reveal any significant findings. What is your last evaluative step?

9) Due to the conditions listed in #2, how should this condition be managed?

Knee Injury

During a high school football game, at the end of a play, a lineman is identified as remaining on the ground after being hit, however you did not see the incident.

1) What is your first course of action?

2) When you get to him, he is lying in the fetal position, holding his right leg in his hands, complaining of intense knee pain. How do you initiate your evaluation?

3) He does not remember anything other than being hit, and feeling immediate pain in his knee. What is your next step in evaluation?

4) He does not want to change position or move his leg. When you try to pull his pants above his knee, he is in too much pain for you to accomplish your task. What do you do to manage the situation?

5) Once you get the area exposed, you see how much he has already swelled. The swelling was immediate, and is located below the tibial flare. It is very hot to touch. What is your next course of action? Should this athlete be removed from the field at this point?

6) He is point tender over the tibial plateau. No defects are felt in the tibia or femur. What are your next steps in evaluation?

7) He is unwilling to move his leg due to pain. You are able to passively move his leg to perform special tests which reveal a positive Lachman's. What pathology do you suspect? Are there any special considerations that would indicate one pathology over another?

8) If your suspicions are correct, how do you explain the results of your special tests?

9) How do you manage the situation?

Face Injury

While attending track and field nationals, you sit with the javelin throwers awaiting their round of competition. You hear someone yell "heads-up" as you see a javelin "catcher" look up from where he is standing in the javelin sector. He is wearing a floppy straw hat, so he does not see that the javelin is heading directly towards him. You watch as the javelin penetrates his face.

1) What is your first course of action?

2) Almost immediately after being hit, you watch him reach up and pull the javelin from his face as he falls to the ground. What do you do when you reach him?

3) He is conscious and appears stunned. A student athletic trainer approaches you and asks you what she should do. What do you tell her?

4) What is your next course of action?

5) The javelin penetrated between the bridge of his nose and the medial aspect of his orbit. He can breathe, but he has blood in his mouth that he wants to spit out. What might that implicate?

6) How do you assess your suspicions?

7) Observation reveals a penetration hole in his soft palate approximately the size of a quarter. How do you manage this situation?

8) What is the most important thing for you to remember in situations such as these?

Arm Injury

During wrestling practice challenge matches, two wrestlers are on the mat, struggling for the advantage over their opponent. One wrestler posts on his right arm and gets chopped by his opponent to the front of his elbow, just below the joint line. He collapses to the ground and is yelling for the match to stop. As the commotion in the room dies down, he sits up holding his right forearm in his hand. His arm is obviously deformed.

1) What is your first course of action?

2) He arm is held in flexion. His forearm appears shortened, and he looks like he has acquired olecranon bursitis. What pathology(s) do you suspect?

3) What is your next step in evaluation?

4) Palpation indicates that his humerus appears to be displaced anteriorly to his olecranon. Palpation of the olecranon reveals too much of the olecranon process is palpable. What is your next course of action?

5) His radial pulse is 120 bpm and is strong. Capillary refill is good. Has your suspected pathology changed?

6) How do you manage this condition?

EVALUATIONS AND REHABILITATION

THE FOOT

Foot Injury

A men's soccer player enters the athletic training room one day before practice complaining of a sharp pain in his foot. The athlete states his first step out of bed in the morning causes an electric stabbing pain in the ball of his foot. He also gets the same pain during soccer practice. He takes his shoes off immediately after practice to relieve his pain. You notice the soccer boots he brought into the training room look new. The athlete confirms he is breaking in new boots.

1) How do you start your evaluation?

2) What pathology do you suspect based on the subjective information?

3) Observation of the athlete's foot does not reveal anything remarkable compared to the contra-lateral side. ROM is normal and MMT indicates full strength. Walking barefoot does not produce pain. What is your next step in evaluation?

4) There is pain with walking when wearing his boots. Are there any other items you would want to evaluate?

5) His metatarsal mobility is limited. Pencil eraser test and Metatarsal Rolling Grind test are both positive. What do you suspect is this athlete's pathology, and what do you suspect is the cause?

Foot Injury

During a rain delay at a tennis match, one of your athletes approaches you, complaining of pain in her foot. She first noticed it during a long point during her match. It has not gone away. She complains of pain around the outside of her foot.

1) Is there any other information you need to complete the history aspect of your evaluation?

2) She indicates that she has not injured her foot before, however she has "abnormally wide feet" and has to buy men's tennis shoes to accommodate her feet. The pain is a constant ache, which worsens when she stands on it. Getting off her feet helps to alleviate her discomfort, although she can still feel it. Do you continue your evaluation during this rain delay, or do you wait until the completion of the match? If you continue, what is your next step in evaluation?

3) Observation reveals wide feet, particularly through the mid and forefoot. Palpation indicates increased tone in her right abductor digiti minimi, compared to the left foot. Although she complains of diffuse pain over the whole lateral aspect of her foot, she has no other palpable pain. ROM is full, without pain. Are there any special tests to perform on this athlete? If so, what?

4) All special tests are negative. What pathology do you suspect based on your findings? Do you allow this athlete to continue in the match? If so, are there any steps you can take to immediately that would help her?

5) Through-out the next week, she goes to the ATR for heat and stretching before practice, and ice after practice. At the end of the week, she enters the ATR complaining of worsening pain in her foot. She walks with an antalgic gait, trying to minimize time spent on her right foot. She says during practice, she pivoted to get a ball, and felt immediate pain in her foot. The pain has not abated. How do you initiate your re-evaluation?

6) Observation reveals nothing different than before. Palpation reveals the spasm of the abductor digiti minimi is reduced from before, but still increased compared to the contra-lateral side. She is now TTP along the shaft of her fourth MT, especially on the proximal aspect, around the metatarsocuboid joint. She only has pain with palpation, or when she stands on her foot. However, her palpation pain is worse than standing pain. ROM is still full, without pain. Are there any special tests you would perform on this athlete? If so, what?

7) All special tests produce moderate discomfort. What pathology do you suspect? What is your next course of action?

Foot Injury

A women's soccer forward approaches you after a game, complaining of pain in her foot. She says she does not know if she is just sore since she just played most of the game, or if she hurt her big toe. Unfortunately, she has to go to work and does not have the time for you to look at her immediately. She asks what she should do for herself.

1) What do you tell her?

2) She comes into the athletic training room before practice the next day and reports that she iced her foot last night, which made it feel better. She feels okay today. What is your next course of action?

3) She reports her foot has been bothering her during practice for a little while now. She does not remember how long, but she has always been able to play through it. Yesterday was the first time she felt it during a game. The pain is in her big toe. What other information do you need to know about her pain?

4) It hurts her when she pushes off of that foot. The pain is sharp, but she only feels it when she is playing soccer or running. She has had her boots for a few months, and they are broken in well and are comfortable. There have been no changes in her training routine. Before continuing your evaluation, what injuries do you suspect?

5) How do you continue your evaluation?

6) Observation reveals nothing significant. She is not swollen nor does she have any boney prominences that may cause irritation. She has full ROM and strength in her foot and first MTP joint, but reports pain in her first MTP with hyperextension. You cannot find any palpable pain. Is your evaluation complete?

7) Varus and valgus tests are negative. There is pain with hyperextension. What pathology you suspect?

8) How do you manage the situation? Is this athlete able to participate?

9) After practicing with her first MTP fixated, she reports that she had more pain. Is that to be expected? What do you do?

10) During your re-evaluation of her foot, what should you be sure to focus on?

11) Her non-weight bearing posture looks normal, however, when she is standing in full weight bearing, her second ray looks medially deviated. She still reports pain in the same spot when walking. What special tests should you perform?

12) Stress testing produces pain, with grade 3 laxity of the MTP on the dorsal and plantar aspects. Now, what pathology do you suspect?

Foot Injury

A women's soccer player limps off the field with a toe gait, complaining of pain in her foot.

1) How do you initiate your evaluation?

2) She was planted when she twisted and felt a "pop". Her pain is around the middle of her foot and the front of her ankle. What is your next step in evaluation?

3) She presents with mild swelling around the anterior ankle. There is no discoloration. How do you continue your evaluation?

4) She is point tender over the cuneiforms. Palpation of the medial aspect of the navicular increases her pain in the mid-foot. What is your next step in evaluation?

5) All AROM is WNL, with pain. RROM is 4/5 due to pain with dorsiflexion and eversion. She is unable to bear weight. What is your next step in evaluation?

6) Stressing her metatarsals causes pain. What pathology do you suspect?

7) What is your next course of action?

Foot Injury

A men's basketball player enters the athletic training room complaining of foot pain.

1) How do you initiate your evaluation?

2) He reports no pain during the day; his pain starts with basketball practice and continues for a few hours afterwards. He has never had foot pain before, but this has been hurting for a couple weeks. Upon observation, you consider your significant findings to be his ectomorph frame and pes cavus feet with rigid arches and claw toes. What is the next step of your evaluation?

3) His pain is dorsal near the subtalar joint. What are your next steps in evaluation?

4) He presents with decreased flexibility of his plantar flexors, and posterior tibialis weakness. How do you continue your evaluation?

5) Special tests reveal negative subtalar laxity, talar dome stress, and navicular compression or percussion. The positive findings indicate midfoot hypomobility and forefoot hypermobility. Dorsal pain is elicited with forced inversion with dorsiflexion. Why is that finding significant?

6) What pathology do you suspect? Why?

7) What is your next step in evaluation?

Foot Injury

A cross country runner enters the athletic training room before practice complaining of foot pain. She has been managing the situation on her own, but her pain is now worse.

1) Is the information given sufficient for the history portion of the evaluation? If not, what other information is necessary?

2) She began running 3 weeks ago, after a knee injury. She wears orthodics, but has also been wearing heel cups for chronic heel pain. Her foot hurts to walk, at the end of the day and when she gets out of bed in the morning. She has been icing and massaging her heel on her own, but last night her pain was worse after her massage. What is your next step in your evaluation? What pathology do you currently suspect?

3) She walks on the lateral aspect of her foot. She says this is due to her pain levels. Foot posture indicates pes planus, which is corrected when tested on her orthodics. What is the next step in your evaluation?

4) She has moderate discomfort with medium pressure over the arch. She is point tender at the medial calcaneal tuberacle, but has no pain over other aspects of her calcaneous. What pathology do you suspect?

5) Passive dorsiflexion is limited at the end ranges, as is toe hyper-extension. All other ranges are normal. What might limited dorsiflexion indicate, and how is that important to your evaluation?

Foot Injury

A tennis player complains of a thick spot on the bottom of his foot. Observation reveals a focal site of thickened tissue with little brown dots proximal to the metatarsal heads. Direct pressure to the spot does not produce any symptoms, but pinching the area does produce pain.

1) What pathology do you suspect?

2) How is the condition you have evaluated commonly treated?

3) If not treated, what will happen?

4) After treatment can the athlete return immediately to participation? If not, then when?

Foot Injury

You observe a cross-country runner entering the athletic training room with a calcaneal gait.

1) What is a calcaneal gait?

2) He explains that he has a sharp pain in the ball of his foot when he walks or runs. How do you initiate your evaluation?

3) He has been increasing his mileage. He is now running in both the morning and the evening to meet his training goals. You decide to conduct the observation portion of your examination. At this point, what will most likely be the most revealing aspect of your evaluation?

4) Observation of his foot does not reveal any significant findings, however, his shoes are old with the tread worn. What steps do you take next in evaluation, and what pathologies do you suspect?

5) Palpation of the first MCP joint produces pain. ROM and strength are full. What is the differential diagnosis for the suspected condition?

6) MCP stress tests are negative. How do you isolate the sesamoids?

7) Sesamoid palpation reproduces his pain symptoms. What pathology do you suspect?

8) How do you treat or manage this condition?

Foot injury

During a track meet, a triple jumper hit the board off her right leg, and collapsed into the pit. She complains of immediate, unrelenting pain over the front of her ankle.

1) How do you initiate your evaluation on the field?

2) The athlete reports a previous ankle sprain, which felt "nothing" like her pain now. Inspection reveals no deformities or swelling. The athlete is only TTP over the talar dome. How do you continue your evaluation?

3) All plantar flexion (passive, active, resisted) is normal. Passive dorsiflexion is asymptomatic, but the athlete is unable to actively dorsiflex her foot. Bump test produces pain over the talar dome. What pathology do you suspect?

4) How do you manage this situation?

THE ANKLE AND LOWER LEG

Lower Leg Injury

During warm ups for an away football game on artificial turf, an athlete walks off the field with a slight limp and comes towards you complaining of pain in his calf. He says he was back peddling, planted and pushed off to go forward. As he came up on his toes he felt a "pop" in his calf.

1) What injuries do you suspect?

2) How do you initiate your evaluation?

3) Observation reveals an antalgic gait, with no other significant findings. Palpation reveals point tenderness around the distal calf. What is your next step in evaluation?

4) ROM is full, however strength is decreased. Athlete reports pain with active plantarflexion and passive dorsiflexion. What is your next step in evaluation?

5) Thompson's test is negative. What is your next course of action?

6) After icing, observation reveals a mass proximal to the calcaneus. What injury do you suspect?

7) How do you confirm your suspicions?

8) No movement is noted. What does that indicate?

9) If the Achilles is ruptured, how do you explain the (-) Thompson's prior to icing, but a (+) Thompson's after icing?

Ankle Injury

The first day after winter break, while you are watching basketball practice, a post player running towards the basket collapses on the floor. She is lying on her side with her right lower leg in her hands, crying. You approach her and calm her down.

1) What are the first questions you would ask her?

2) She reports that she was running, went to cut to the left and rolled her right ankle. She never made contact with any other player. What other question would be relevant to your evaluation?

3) Yes, she has. The coach is badgering you about moving her so that she can continue practice. How do you handle the situation?

4) While she is still on the court, is there any other information you need to obtain prior to moving the athlete?

5) She is able to move her knee and her toes. Are there any special tests to perform on the court prior to moving this athlete?

6) Bump, Squeeze and Percussion tests are negative. What is your next course of action?

7) She decides to hop off the court; but she is able to bear weight, although it is painful. Once off the court, how do you continue your evaluation?

8) She has a pocket of swelling superior to the lateral malleolus. Palpation reveals tenderness over the tibiofibular syndesmosis, ATF ligament and CF ligaments. What are your next steps in evaluation?

9) She has full plantar and dorsiflexion, although end-ranges are painful. She has restricted range in inversion and eversion due to pain. Special tests indicate a positive Anterior Drawer, Inversion and Talar Tilt. Kleiger's is negative. What pathology do you suspect?

10) What severity do you suspect and why?

11) What is your immediate management of the situation?

Lower Leg Injury

A cross-country runner enters the athletic training room 4 weeks into the season, complaining of "shin" pain. She indicates that she always had "shin splints" in high school, and now that she is in college, with access to an athletic trainer, she thought maybe you could help her.

1) How do you initiate your evaluation?

2) She ran throughout high school, and always had shin splints. She would ice them on her own, but that was all. She bought new shoes more frequently than anybody else on her team because newer shoes helped a little to alleviate her pain. Her pain is a constant ache, but becomes sharp when she runs, especially when she is out on the road. The pain is on the inside of her shin. She is currently training with the team and they are running twice a day for a total of about 40 miles a week. She tries to ice her shins after practice, but in the mornings it is hard because she goes to class after practice. What is your next step in evaluation?

3) Observation of her lower leg reveals some puffiness along the mid-shaft of the tibia. Why is it essential with lower leg chronic injuries to assess foot biomechanics and posture as well as body posture and gait?

4) Observation of her foot posture and biomechanics reveals pes planus, and rearfoot valgus. Her standing posture reveals an anteriorly rotated pelvis and genu valgum. What do you suspect is the cause of her pain?

5) What is your next step in evaluation?

6) Palpation of the medial tibia is painful and continues to be painful with palpation posterior to the medial malleolus and into the medial longitudinal arch. Nodules are noted along the tibia. Are there any other areas to be palpated? If so, where? Why?

7) What are your next steps in evaluation?

8) ROM is full in all areas. Strength testing produces pain with inversion. Weakness is noted with inversion and dorsiflexion. Are there any other areas strength testing should be performed? If so, where? Why?

9) She is weak in all areas listed. What pathology do you suspect?

10) How is this condition corrected?

11) Are there any general health conditions you would like to assess for this athlete, why?

12) What is your next course of action?

13) How will you treat this condition?

Ankle Injury

During a high school football game, a receiver catches the ball, plants his left leg, and takes a hit to his hip. He is hit from the left side, causing him to rotate to the right, while his left leg remains planted. After being tackled to the ground, he is slow to stand. A teammate holds out a hand and pulls him up, but after taking a step on that foot, he doubles over back onto the field.

1) How do you handle this situation?

2) Back on the sidelines, the athlete reports pain in his ankle that worsens when he tries to stand on it. How do you continue your secondary survey?

3) No swelling or deformity is visible. What is your next step in evaluation?

4) Palpation is only painful over the distal syndesmosis. How do you continue your evaluation?

5) Active plantar and dorsiflexion ROM and strength are limited due to pain, especially plantarflexion, while inversion and eversion ROM and strength are full and asymptomatic. How do you continue your evaluation?

6) Bump and squeeze tests are painful at the distal tibiofibular joint. Anterior Drawer is positive for pain, also at the distal tibiofibular joint. Inversion is negative. Talar Dome Stress is positive for pain, not at the talar dome, but again at the distal tibiofibular joint; and any kind of talar rotation while in neutral causes him immense pain. Kleiger's is positive. What injury do you suspect? Why?

7) Are there any other injuries you need to rule out? If so, what are they and how do you rule them out?

Lower Leg Injury

A cross-country runner enters the athletic training room complaining of fatigue in her lower leg. Her "shin" has been feeling tight and tired.

1) How do you initiate your evaluation?

2) She has never experienced "shin" pain before. Her pain is constant, like an ache; but when she runs the pain becomes sharp. She has been running a lot of hills lately. She bought new shoes a few weeks ago. Her biggest complaint is fatigue in the front of her leg and down onto her foot. What is your next step in evaluation?

3) Observation produces no significant findings. How do you continue your evaluation?

4) Palpation of the tibia is not painful. However, palpation over the tibialis anterior is tender and increased tone is noted. Crepitus is noted as the tendon crosses the front of the ankle onto the dorsum of the foot. What type of pathology do you suspect?

5) With the pathology listed in #4, what is the differential diagnosis?

6) AROM and PROM are limited in plantarflexion, due to both tightness and pain. Passive dorsiflexion is full, but actively pain is felt. Resisted eversion elicits some symptoms, as does passive inversion. What pathology do you suspect based on your findings?

7) What should be the main therapy goal for this pathology? How will you accomplish this goal?

8) Should this athlete alter her training regimen? How?

Lower Leg Injury

During the pre-season, a women's basketball player enters the athletic training room complaining of pain in her "shin", pointing to her tibia.

1) How do you initiate your evaluation?

2) She reports that she first felt pain in her shin last week when the team was conditioning. She was running bleachers when she first felt pain "behind her ankle gone". After bleachers they ran sprints, when she felt a sharp pain in her arch. She has never had foot problems before. What is your next step in evaluation?

3) She has no visual deformity in her leg. However, her shoes are worn and need to be replaced. Her foot posture reveals pes cavus with pronation. What is your next step in evaluation?

4) She is point tender along the distal, medial tibia, continuing posterior to the medial malleolus inferiorly into the arch. However, the arch itself is not tender. How do you continue your evaluation?

5) She is 5/5 in AROM of both the foot and ankle. Resisted inversion is 4/5, with pain. However, passive eversion produces more pain. Hallux ROM is full, 5/5 on strength and produces no pain. What pathology do you suspect?

6) Are there any other steps necessary in your evaluation? If so, what are they?

7) Is this condition at all related to participating in worn shoes? If so, how?

8) Will the purchase of new shoes help manage this condition?

THE KNEE

Knee Injury

(This scenario may require unconventional thinking.)

A women's basketball player enters the athletic training room after returning from winter break complaining of right leg pain. Her hip aches all the time and her knee hurts when she plays. She reports running over break for conditioning. She has been having knee pain for a few weeks, with the severity increasing recently. Her hip has been painful for about 1 week.

1) How do you begin your evaluation and what structures do you suspect?

2) Your evaluation determines that ROM is full without pain and strength is full. Long-sit test indicates that the right leg appears longer than the left. With Faber's test, the right leg lacks abduction compared to the left side and the Sacroiliac Joint Fixation test indicates the right SI is higher than the left. What are your thoughts regarding the athlete's condition and what is your next step in evaluation?

3) Hip ROM is full and strength is good, but abduction is 4/5 with MMT. Palpation reveals tenderness on the lateral aspect of the hip, distal to the iliac crest. All hip special tests are negative. What do you do next in your evaluation?

4) Your knee evaluation reveals full ROM and strength. The lateral aspect appears "thicker" than the contra-lateral leg. The athlete is tender to palpation over Gerdy's Tubercle and distal ITB. Varus and Valgus stress tests are negative at 0 and 30 degrees. Meniscal tests are negative. Lachman's and Posterior drawer tests are also negative. With Ober's test, the right leg does not adduct, but stays abducted with a springy feel to it when forced into adduction. Pain is felt. What is your assessment of this athlete?

5) Do you feel your evaluation is complete, or do you need to continue down the kinetic chain? Why or why not?

6) How do you treat this condition?

Knee Injury

During a wrestling match, one man was in a figure 4 position when his opponent pulled on his lower leg. He collapses and was unable to continue the match. When you get out to him on the mat, he states he heard a "pop" in his knee. He is panicked because he has a history of knee injury from a car accident.

1) How do you handle the situation? Do you perform your evaluation on the mat, or do you move him off the mat first? What judgment calls do you make first?

2) A Lachman's is negative, as is Posterior Drawer and Valgus stressing. Varus testing is positive within the athlete's range. His ROM is limited to 25% of his normal range. His pain is on the lateral aspect. With this information, what judgment calls do you make?

3) Once off the mat, how do you continue your evaluation?

4) He is point tender over the lateral aspect of his knee. You cannot perform McMurray's due to pain and ROM restrictions. What pathology do you suspect?

5) What is your immediate treatment of this suspected injury?

Knee Injury

During a high school football game, a wide receiver comes hobbling off the field during the first series of the opening game of the season. He attempts to run with his right leg straight, and he collapses when he reaches the sidelines, crying from pain. As the athletic trainer, you happen to be standing next to him, so immediately you ask him where it hurts. He says his knee. When you ask him where, he points to the lateral aspect. You ask him what happened, and he says he took a helmet to his knee.

1) The athlete is insistent that he needs to go back in the game. What do you do to manage the situation?

2) No deformity or swelling is apparent. The entire lateral aspect of his knee is tender to palpation. A Lachman's is negative. The athlete is able to flex and extend his knee, but most importantly, is unable to run down the sidelines. What is your next course of action?

3) When you ask him exactly what happened, he reports that he was planted when he got hit. You ask him if it was the same knee as last year, because you remember that this athlete had sustained a 2nd degree MCL sprain during basketball season. He confirms it is the same knee. You are concerned because you know that the athlete's doctor only required him to sit out for 1 week last year post injury and his MCL did not sufficiently scar down. The athlete was also not consistent in wearing his knee brace and was not wearing it in this game. Are there any aspects of his previous injury which would concern you regarding his present complaints? How will this affect your evaluation?

4) Upon evaluation, the lateral aspect of the knee is extremely tender to palpation making stress testing impossible. What do you do?

5) After icing the athlete's knee for 20 minutes, you are able to touch his knee without hurting him. A Lachman's and Posterior drawer are negative. Lateral structures are not painful. Valgus stress-test at 30 degrees reveals significant gapping with a boggy end-point. The athlete jumps on the table in pain. You calm him and test the other leg at 30 and 0 degrees, which reveals minimal gapping with a solid end-point. You return to the injured leg and palpate the medial capsule and the MCL, both are tender. What pathology do you suspect?

6) You continue to think through the facts, and wonder what the extent of the injury is. You realize you did not complete your stress-tests on the athlete. You Valgus stress-test him at 0 degrees which reveals severe gapping with no end-point. Your impression is that you could dislocate the tibia right off the femur; this is not painful for the athlete. You repeat the stress-test at 30 degrees, which reveals

significant gapping with a boggy end-feel, the same as before. Now what injury do you think this athlete sustained?

7) What do you do now to manage the situation?

8) Should the athlete be taken to the emergency room?

Knee Injury

During basketball season, one of the high school boys comes to you complaining of knee pain.

1) How do you initiate your evaluation, and are there any specific questions you should ask?

2) He informs you he is a freshman, and is 14. He is currently playing basketball, but he also plays football in the fall and baseball in the spring. He also plays in a summer baseball league. He does not remember when his knee started hurting. But it has been bothering him for awhile. It hurts the most to run, jump, and squat in his catcher's stance, and it hurts in the front of his knee. Based upon the known information, at this point, what pathology do you suspect, and why?

3) Once the history portion of your evaluation is complete, how do you continue your evaluation?

4) His tibial tuberosity is enlarged compared to the contra-lateral leg. He is point tender over the distal aspect of his patellar tendon and tibial tuberosity, particularly when pinched. Crepitation is felt. What is the next aspect of your evaluation?

5) Range of motion is full, with pain felt during full flexion. Knee extension is 4/5, with pain felt over his tibial tuberosity. What pathology do you suspect?

6) Describe the condition listed in #5. What is it? How is it caused?

7) How is this condition initially managed?

Knee Injury

At the beginning of the school year, a men's basketball player enters the athletic training room complaining of a "weird" feeling in his knee. He thought he should get it checked out before the season started.

1) How do you initiate your evaluation, and are there any key questions that can aid you with the evaluation?

2) The sensation has been there for a few weeks, but he does not feel it all the time. He feels it when he extends his leg all the way. He feels it on the outside of his "knee cap". He has been jogging for aerobic fitness, but his knee feels fine when he jogs. He has not been playing any basketball. He has been working all summer in a hardware store which requires a lot of squatting to stock shelves. The sensation is not pain, but a "weird loose feeling". What are your next steps in evaluation?

3) The lateral border of his patella is a little "puffy" compared to the other leg. Otherwise observation reveals a symmetrical, unremarkable knee. Patellar tracking is normal. Palpation of the superior-lateral facet produces pain. Patellar ROM is normal. Pain is only elicited when the patella is pushed superior-laterally. Knee ROM is full, with pain elicited upon full passive extension. What pathology do you suspect from the current information you have? What is your next evaluative step?

4) Patellar compression reproduces pain. Patellar apprehension is negative. What pathology do you suspect?

Knee Injury

(This scenario may require unconventional thinking.)

A men's basketball player indicates one day in the pre-season that he has pain around his knee cap. He indicates that he has a history of patellar pain, but recently it has become more irritated as his physical activities have increased.

1) How do you initiate your evaluation?

2) He has difficulty with accelerating and decelerating, jumping, and running and jumping exercises. It is difficult for him to walk around for long periods of time. He experiences the most relief when he rests for a period of time doing minimal physical activity. What is your next step in evaluation?

3) Patellar mobility is good medially to laterally. Superior to inferior mobility produces pain, both from the pressure on the distal pole of the patella, and within the range. Knee ROM is limited in terminal knee extension with moderate pain. Knee flexion is limited past 90 degrees, also due to pain. He has difficulty squatting. What pathology do you suspect?

4) What is the differential diagnosis for the suspected condition?

5) What other pathologies might this athlete have?

6) How long does this condition typically last?

7) Are there any specific modalities you would use, why? Outline the settings for those modalities.

9) How do you help prevent this from becoming a chronic problem?

Knee Injury

(This scenario might require unconventional thinking.)

In the middle of September, a tennis athlete enters the athletic training room, stating that her knee hurt and she was tired of trying to deal with it.

1) How do you initiate your evaluation?

2) She indicates to you that she has a substantial history in this knee. She has had three surgeries in the past two years. Her last surgery was two months ago. Is there any other history information needed from this athlete?

3) She indicates that each surgery was arthroscopic, looking for meniscus tears, but no tears were ever found, so "nothing" was ever performed. She has been to a lot of physical therapy, including three times a week for the four weeks after surgery, until she came to school. Since then, she has been playing tennis with the team. She ices it every day after practice, but it hurts, and she has a swelling problem down into her calf and foot. Her pain is the same as before surgery and she always has pain. But her pain worsens during play and remains throughout the night. How do you continue your evaluation?

4) Observation indicates her right knee has mild swelling compared to the left. ROM is almost full, lacking terminal extension and full flexion. Pain is only felt at the end-ranges. Over-all strength in the right leg is diminished compared to the left. The right quadriceps will not contract completely, and the VMO is atrophied, resulting in a mild inverse "J" sign. What is your next step in evaluation, and what are your thoughts on possible injuries to this athlete?

5) Palpation indicates tenderness across the medial tibial plateau and tibial flare. She also has mild peri-patellar pain. What is your next step in evaluation? Are there any changes in your thoughts on injuries to this athlete?

6) A Lachman's is negative, as are Posterior Drawer, Varus and Valgus stressing, and McMurray's. Ober's test is positive. Based on your findings, what is your assessment?

7) What is your treatment plan for this athlete?

8) What exercise is the most effective for VMO strengthening?

9) As her therapy progresses, she shows signs of improvement. Her swelling decreases, her neuromuscular control improves, and her pain decreases. She continues to participate in tennis drills to tolerance, but does not play in any

matches. However, one day after practice, she indicates that she is in a lot of pain and that her coach had made her play a challenge match that day. You treat her symptomatically for pain, but she never recovers. Despite trying cold, heat, TENS, EMS, compression wraps, and cessation of play, her pain has increased over the last week. How do you handle this situation?

10) Re-evaluation of the athlete reveals that her ROM has improved, but still lacks full flexion. Palpation indicates tenderness along the medial tibial flare, but not over the medial joint line. Further palpation isolates her pain to her Pes Anserine. Crepitation is felt. Strength testing is 4/5 with pain in adduction and knee flexion. All special tests are negative. What pathology do you suspect?

11) Is your evaluation complete? Is there any other information needed at this time? Why?

12) Her feet reveal severe pronation and pes planus. Her walking biomechanics reveal forefoot varus and excessive toe-out compensation. Are there any relevant questions to ask this athlete?

13) She indicates that she has not had back pain in a long time. But, she "had" scoliosis when she was younger. At her last x-ray, which was probably 6 years ago, she had a 25-degree curvature. One of her legs is functionally longer than the other. She indicates that she never told you because she did not think it was important. What is your impression of this athlete's present condition?

14) What is your next course of action regarding this athlete?

Knee Injury

A wrestler enters the athletic training room before practice, complaining of knee pain.

1) How do you initiate your evaluation, and what does that step entail?

2) His knee pain has been getting gradually worse over the last couple weeks. His pain is posterior-lateral. It is a dull ache, but sometimes is sharp. It hurts off and on throughout the day. He has not been able to figure out what makes it worse, except for running, wrestling, and sitting Indian style. He has no history of knee injury or trauma. What is your next step in evaluation?

3) His knees are symmetrical bilaterally. His posture indicates a slight anterior tilt to his pelvis. All other aspects of his postural observation are normal. He is point tender anterior to the LCL and on the posterior knee, distal to the joint. How do you continue your evaluation?

4) He has full range of motion and full strength with knee flexion and extension. Varus stress testing is negative. Ober's test is negative. What pathology do you suspect? What is the differential diagnosis for that condition?

5) Figure 4 position is painful. He also has pain when resisted in the first 30 degrees of flexion when in internal rotation. Are your suspicions correct and what is the next step in treatment?

Knee Injury

During wrestling practice, a wrestler takes a shot, hitting his knee on the mat. He is unable to finish practice, or bear full weight on his right leg.

1) How do you initiate your evaluation, and are there any key questions that can aid you with the evaluation?

2) He has no recent history of knee injury. He feels like there is this constant pressure on his knee. When he tries to move, the sensation becomes sharp pain. What is your next step in the evaluation process?

3) Observation reveals nothings significant, except that he is guarding his leg. What is your next evaluative step?

4) The athlete is point tender over the patella and the immediately surrounding area. All other aspects of the knee are not painful upon palpation. What are your next evaluative steps?

5) His ROM is limited to approximately 10 degrees, within the midrange. Strength testing is impossible due to pain. All other aspects of the knee are not painful upon palpation. What is the next step in your evaluation?

6) A Lachman's is negative, as is Varus and Valgus testing. Patellar Gliding is extremely painful. What pathology do you suspect?

7) Are there any other diagnostic tools you might use to narrow your assessment?

8) How do you manage the situation?

THE THIGH, HIP, GROIN AND PELVIS

Hip Injury

During the second week of double days, a women's soccer player approaches you during practice. She has her right hand on her hip and sticks her right hip out as she walks. She states that her right "glut" hurts.

1) How do you initiate your evaluation, and are there any key questions that can aid you with the evaluation?

2) She does not remember anything specific happening to cause her pain. She reminds you that she sustained a quad contusion 1 week ago which limited her practice for a few days, but she's been back to full practice for 3 days now. She thinks her glut has just been feeling tight for the last week. She has pain in the morning when she feels stiff, and at the beginning and end of practice. Today she reached a point where she could not continue. What type of pathology could she have from this information? What are your next steps in evaluation?

3) Palpation indicates pain on the posterior aspect, inferior to the iliac crest. She has pain with hip flexion and some discomfort during hip extension. All other ranges are full and non-painful. MMT of the gluteus maximus is 5/5. How do you isolate the gluteus maximus?

4) Manual muscle testing of the gluteus medius is 2/5. What does that mean, and how is that test performed?

5) What is your next evaluative step?

6) After holding the position for a few seconds, the left hip drops compared to the right side. Is this a positive or negative finding? What does this finding indicate?

Hip Injury

A non-athlete enters the collegiate athletic training room asking if you will look at him. He has been experiencing hip pain, almost as long as he can remember, but now the pain is horrible and constant.

1) Do you evaluate this person?

2) Your insurance plan has a clause for coverage of non-athletes. What information do you need as you start your evaluation?

3) He reports never participating in athletics. He thinks he has had hip discomfort since junior high, so he never pursued athletics. He does not hurt at night when he is sleeping, but he hurts to sit or getting in or out of cars. It would be impossible for him to sit Indian style. The pain is a constant ache, which can turn to a sharp, stabbing pain with those positions previously mentioned. What is your next step?

4) His gait is normal, but painful. His posture reveals a slightly anteriorly rotated pelvis. He is about 5'10", weighing around 160 pounds. He has no point tenderness with palpation. What is your next step in evaluation?

5) He has decreased hip internal rotation and abduction, but all other ranges are full. He has diminished strength when in flexion with external rotation, but all other directions are full. What is your next step?

6) Hip scouring is painful, as is Patrick's. What pathology do you suspect?

7) If he weighed around 250 pounds, how would that change your suspected pathology?

8) What do you tell this student?

Hip Injury

A high school football walks off the field after a play and approaches you complaining of pain above his hip. He was involved in the "pile" during the last play and felt a helmet hit him hard around his hip. He hurts, and he is scared about what is wrong with him.

1) How do you handle the situation?

2) He is calmer after you talked to him. How do you initiate your evaluation?

3) His hip is the only place he hurts. He has never hurt his hip before. He has no pertinent health history. Observation reveals his right hip is swollen and red over the iliac crest. The Iliac crest is not visible due to the swelling. The area is TTP, with crepitus and increased tone noted. Before progressing with your evaluation, what pathology (s) do you suspect?

4) How do you continue your evaluation?

5) His range of motion is immeasurable due to pain. All movements of the trunk hurt, as well as movements of the legs. Based on these findings, what is your next evaluative step, why?

6) He has full sensation and is capable of movement, even though moving is painful. What pathology do you suspect?

7) Will this athlete return to the game, why?

8) How is the condition listed in #6 managed?

9) Why would trunk and leg range of motion be painful with the condition given in #6?

Thigh Injury

A softball player enters the athletic training room, walking with a stiff knee gait. Yesterday during pre-game, she ran into the outfield fence while catching a fly ball and hit her leg against the fence pole. She played the game, but today is stiff and has difficult moving.

1) Is there any more information you need to know? After the history is complete, how do you initiate your evaluation?

2) There is swelling and ecchymosis over her right quadriceps. What is your next step in evaluation?

3) She is painful over her rectus femoris. What pathology do you suspect?

4) What are your next steps in evaluation?

5) She has approximately 60 degrees of ROM, with decreased strength on MMT 4/5. Do these findings change your pathology suspicions?

6) What would be your therapeutic goals for this athlete?

7) In the management of this condition, what other secondary injuries do you need to help avoid?

Hip Injury

A women's water polo player complains of a weird noise in her hip that is also painful.

1) How do you initiate your evaluation?

2) When it "pops" it feels like it is on the outside of her hip. It happens the most when she is treading water, climbing stairs, or when she gets in and out of her car. What is your next step in evaluation?

3) Observation reveals nothing significant. Palpation reveals tenderness posterior to the greater trochanter. What are your next steps in evaluation?

4) Her ROM is decreased in all ranges, with popping at her lateral hip occurring towards the end-range. Strength testing produces pain with hip extension and hip adduction. How do you continue your evaluation?

5) Active hip flexion and extension reveal a popping that can be palpated over the trochanter, with crepitation. Ober's is positive. What pathology do you suspect?

6) Explain what causes the "popping" sensation.

THE SPINE

Neck injury

During the first game of the high school football season at your new school, an offensive lineman runs off the field with his right arm dangling at his side. He comes to you stating he thinks he has a "stinger".

1) How do you initiate your evaluation?

2) He has had stingers before, and this feels the same. He was involved in a tackle, and he does not remember exactly what happened, but he thinks his head was forced to the left. Immediately he had a burning sensation down his right arm. Now his arm feels weak and tingly. What is your next course of action, and how do you execute your plan?

3) He has no tenderness along his spinous processes. However, he has diminished grip strength. Did you expect this finding? If so, why? If not, what did you expect? What does this finding indicate?

4) How do you continue your evaluation?

5) He can feel your touch in all areas, but he claims he feels a tingle as well. He can execute all movements asked, but he is weak in all areas. Is this finding normal or abnormal for the suspected condition?

6) Palpation of his c-spine musculature reveals increased tone on the right side, and tenderness over trigger points. Is the increase in muscle tone caused by his injury, or is his injury caused by his increased muscle tone?

7) What is your next step in evaluation?

8) What special tests would you perform on his athlete?

9) Brachial Plexus Traction to the left replicates symptoms. Cervical Compression and Distraction and Spurling's are all negative. Practically, what does that mean?

10) Is this athlete done for the night, or will he be able to return to play?

11) Should this athlete commence therapy in the athletic training room, why?

Back Injury

A softball outfielder enters the athletic training room in the pre-season, seeking treatment for her back. She complains of back pain.

1) How do you initiate your evaluation?

2) She has a history of low back pain since she dove for a ball over the summer (this is October). She had x-rays at the time, which were negative. But she has had increased pain for the last few weeks. What other questions should you ask this athlete?

3) She reports that she had been performing dead lifts in the weight room and strained too hard on her last repetition. She felt pain in her low back that was sharp. She has had pain in her back since that day. What other information do you need for your evaluation?

4) She now has radiating pain and tingling down her left leg. What pathology does that indicate?

5) What are your next steps in the evaluation?

6) She has palpable pain over her left lumbar paraspinals. She presents with: pain with trunk extension, side bending left and rotation right and left. She had pain and loss in active range with both hip and knee flexion 3/5. Passively she has pain with knee flexion on the left. She has no pain with knee flexion or extension, or hip abduction. However, hip adduction is 4/5 with pain. How do you continue your evaluation?

7) Special tests indicate negative SI compression and distraction. FABRE was negative, but positioning of the hips produced bilateral pain. Straight Leg Raise produced pain and tingling, as did the Slump test. How do these findings affect your pathology suspicions?

8) Are there any other evaluative steps, or is the evaluation complete?

9) Sensory testing indicates paresthesia in her lower leg and foot. What level(s) does that indicate?

10) What is your next course of action?

Back Injury

(This scenario may require unconventional thinking.)

A member of the men's swimming team enters the athletic training room complaining of back pain. He indicates that his back has been hurting him for awhile now, but today is the first day that he feels that he cannot continue to practice.

1) What questions do you want to ask him to complete the history portion of the evaluation?

2) He indicates that he has no previous back injuries, although it is not uncommon for his back to be sore after swimming. His back hurts in the middle of his lumbar spine. He has no symptoms into his legs. The pain is a constant presence that is the worst after practice. Lying on his back with his legs slightly bent is his most comfortable position. The only thing difference in his practice that he can think of is the kickboard work that has been added into practice the last couple weeks. He does the breast stroke. What are your next steps in evaluation?

3) Observation indicates an anterior tilt in his pelvis. Observation does not reveal any other significant findings. His flexion is limited, although not painful; however, returning to neutral is painful, as is hyper-extension. He has mild discomfort with rotation both to the right and left. Are there any pathologies you can rule out based on the given information, and why?

4) What is your next step in evaluation? Are there any specific tests you would perform?

5) Nerve root testing produced no abnormal findings. The Single Leg Stance test increases his back pain. What last element of the evaluation is needed for completion?

6) Palpation indicates paraspinal spasm bilaterally. No step-off is felt. What pathology do you suspect?

7) What is your next course of action?

THE THORAX

Thorax Injury

During a wrestling match, a wrestler felt pain in his left side. He finished that match and iced the area. Two days later, he was unable to finish practice.

1) How do you initiate your evaluation, and are there any key questions that can aid you with the evaluation?

2) He does not have any recent injuries to his ribs. He does not remember what happened; he just started having pain during the match, but that is not abnormal for him. Today the pain has not subsided, and he is having some pain with breathing once he gets his heart rate up and is breathing hard. His pain is localized around his left lower rib cage. What is your next evaluative step?

3) He has mild swelling on his left side, compared to his right. Palpation of the seventh rib is tender at the costochondral junction. There are no other significant observation or palpation findings. What is your next evaluative step?

4) He has pain with transverse compression and anterior-posterior compression at the same site as your palpation. What pathology do you suspect?

5) Are there any other diagnostic procedures that should be performed? If so, what and to determine what pathology?

Groin Injury

A male high school track sprinter approaches you at practice and complains of pain in his right groin. He says it hurts to start, stop and sprint. It only hurts him at practice, never any time else. It has been getting more noticeable over the last week.

1) What is the most likely pathology based on the information given?

2) How do you initiate your evaluation?

3) Observation reveals nothing significant. His posture is symmetrical, although he has a slightly anteriorly rotated pelvis. He has no palpable pain. What are your next steps in evaluation?

4) His ROM is full in all directions, as is strength testing. What is your next step in evaluation?

5) Hip scouring is negative. 90-90 straight leg raise indicates good hamstring flexibility. FABRE test is negative. Trendelenburg's test is negative. Thomas test indicates flexibility could be increased in his hip flexors, but not pain is felt. Ely's test is negative. After finding nothing significant, what is your next step?

6) After more questioning, he states that the pain is always high in his groin, but he can never touch it himself. It does not hurt to sit or stand. But over the last couple days, he has had a little irritation with urination. What pathology do you suspect?

7) How do you manage this situation?

THE HEAD AND FACE

Face Injury

During a women's basketball game, you observe your point guard face plant on the floor after taking an elbow in her face. She stands immediately, but is disoriented and unstable on the court.

1) What is your first course of action?

2) While you approach the coach, the athlete starts gushing blood from her face into the floor. How do you handle the situation?

3) Once the court is being tended, what is your next course of action?

4) All cranial nerves are intact, the athlete is oriented, and no concussion is suspected. How do you continue your evaluation?

5) As she slides the towel down her nose, you see a laceration on the left side of her nose. It is approximately 1 inch long. Upon palpation of the surrounding tissue, the laceration gaps open, revealing all internal structures located under the dermal layers. She is also bleeding from her nasal passages. How do you manage the situation?

6) The team physician is on her way to stitch up the athlete. While you wait, how do you continue to manage the situation?

7) This athlete returns to play 10 days later. Are there any precautions that need to be made to protect the athlete during participation?

Facial Injury

After practice, a wrestler complains of pain, heat and pressure over his ear. His skin is red and hot over the superior half of the cartilage. Cartilage definition is minimal from swelling superficial to the cartilage.

1) What pathology do you suspect in this wrestler?

2) How do you manage this condition?

3) What are possible complications of this condition?

4) Will this ear ever return to "normal"?

Tooth fracture

On a basketball road trip, one of the men's players decides not to wear his mouth guard. Almost immediately he takes an elbow to his mouth, doubling over with his hand over his mouth. You approach him and ask him to remove his hand. He does and you see pieces of teeth in his palm. When he smiles at you, you see he is missing the bottom half of his four top front teeth with the roots still intact.

1) How do you manage the situation?

2) In the absence of a head injury, the athlete is not bleeding, but his teeth are sensitive to air and water (cold). All teeth are stable. Is this an emergency? Can this athlete continue to play?

3) When should he be referred and who should he see?

THE SHOULDER

Shoulder Injury

During wrestling practice, a wrestler was dropped, landing on the tip of his shoulder. He continued to practice and felt minimal pain, except when he "extended" his arm or landed on his shoulder. He approached you after practice to make sure that he was okay. He has never before hurt his shoulder.

1) How do you initiate your evaluation?

2) He thinks he was about 1 foot above the mat when he was dropped onto his shoulder. The impact hurt, but he was able to continue practice. If her were to lift his arm, his shoulder would hurt. How do you continue your evaluation?

3) Observation reveals visible edema around his left AC joint. He is point tender over his AC joint. What is your next step in evaluation?

4) His ROM is diminished with pain at the end-ranges of flexion and abduction. What is your next step in evaluation?

5) Strength testing produces pain in flexion, abduction, and shoulder shrugging. How do you continue your evaluation?

6) He has a positive piano key test and pain with inferior humeral distraction. What pathology do you suspect?

7) What is your immediate treatment and long term timeframe for return to participation?

Arm Injury

During half time of a collegiate football game, a middle line backer tells you he had felt a "pop" in his shoulder. He had reached to tackle somebody, grabbing his opponent's jersey, and slipped. (It was a rainy game.) When he slipped, he felt the "pop" in the front of his shoulder. He had continued to play through the rest of the half.

1) How do you initiate your evaluation?

2) The athlete looks symmetrical bilaterally. Palpation reveals tenderness over the coracoid process. ROM and strength are full, without pain. The team is now ready to return to the field for the second half. Do you continue with your evaluation, why or why not?

3) The athlete was able to play effectively throughout the second half. What do you do after the game for this athlete?

4) He presents with a palpable asymmetrical mass on the medial side of his biceps. It is painful to touch. He is also point tender at the coracoid process. Shoulder and elbow ROM are full. What do you suspect?

5) What is the differential diagnosis or evaluation you do to confirm your suspicions?

6) The athlete is able to flex his arm and supinate his forearm, although his strength is 3/5 and he indicates some pain. What is your next step in evaluation?

7) All biceps special tests are negative. What does that implicate?

8) What is your next course of action?

Shoulder Injury

A baseball player approaches you during practice, wanting to share with you a "cool" thing with his shoulder. He says his right shoulder squeaks when he moves it. He wonders if you know why it squeaks.

1) How do you initiate your evaluation? Explain the demeanor you use so as not to scare the athlete regarding his potential injury

2) His shoulder has been squeaking for a few weeks. He has pain when he raises his arm in front of him. He states that he has never "injured" his shoulder; however, he has always had some tendonitis during his years of playing. He just "deals with it". Sometimes it hurts when he gets up in the morning. What type of pathology do you suspect at this point? Why?

3) How do you continue your evaluation? Are there any specific signs or symptoms you would use to differentially diagnose the injuries you suspect in #2?

4) Observation reveals his right arm is slightly lower than his left. Otherwise, all findings are normal. Palpation reveals pain and snowball crepitis in the inter-tubercular groove. What are your next steps in evaluation?

5) Shoulder flexion is full, but painful at the end-range. All other ranges are full and non-painful. Strength testing is full in all directions. What is your last step in evaluation?

6) Positive special tests are: Neer's, Yergason's, Speed's, Hawkins-Kennedy, and O'Brien's. Are your suspicions correct regarding what type of pathology you suspected in #2?

7) What is this athlete's specific pathology?

8) What is the ideal way to treat this injury?

9) Describe a rehabilitation plan you might enact for the first two weeks of rehabilitation.

Shoulder Injury

After practice, a tennis player enters the athletic training room with complaints of shoulder pain. She has a history of asymptomatic asymmetrical scapular rhythm and is presently on a rotator cuff strengthening program.

1) What additional information do you need regarding her history?

2) She reports that her shoulder has been feeling achy and when she plays tennis there is a "pop" around her scapula. She has been icing it after playing. However, yesterday she was in the front seat of her car, and she reached behind her to grab something when she felt sharp pain in the front of her shoulder. She then played tennis this morning and is now feeling extreme pain. What injuries do you think she might have just from this description? How do you continue your evaluation?

3) She is point tender over her coracoid process, biceps long head, and greater tubercle. Observation reveals her shoulder is significantly lower than the contra-lateral side. She is unable to lift her arm to 90 degrees without pain. At 90 degrees, her shoulder hesitates and performs a visible "zig-zag" motion before continuing in the range. She indicates that the "zig-zag" is painful and feels like a "pop". Do you suspect any pathology at this point?

4) How do you continue your evaluation?

5) Special testing reveals positive: Drop Arm test, Apprehension, Relocation, Hawkin's, Yergason's, O'Brien's. What do these results indicate?

6) What pathology do you suspect?

7) What is your next course of action?

FOR ADVANCED STUDENTS

8) What type of rehabilitation strengthening and stretching exercises would you do for this athlete?

9) Are there any modalities that would use beneficial for this pathology? If there are, what are they? If not, why?

10) If this athlete had surgery (capsular shrinkage), what would be your rehabilitation goals for:
    a. Phase I rehabilitation
    b. Phase II rehabilitation

c. Phase III rehabilitation

11) What types of strengthening exercises would you do differently for each of these stages?

Shoulder Injury

At the beginning of the academic year (September), a tennis player seeks out the athletic training staff, complaining of pain in her shoulder. She has been having trouble with her right shoulder for about 2 years. She went to physical therapy over the summer for shoulder impingement, but there has been no change in her pain or function.

1) Is there any other information you need from this athlete to initiate your evaluation?

2) She reports that overhead activities like serving, volleying, and resting with her arms above her head produce pain and soreness. Her shoulder feels like a constant ache, with some sharp stabs of pain. What is your next step in evaluation?

3) She presents with her shoulders slightly rolled forward. What causes the glenohumeral joint to move anteriorly?

4) Palpation produces pain anteriorly in the bicipital groove and along the posterior capsule. How do you continue your evaluation?

5) ROM is WNL with pain at the top ranges of flexion and abduction. All strength is 5/5. Her right shoulder has 1 degree laxity compared to her left. Apley's, Empty can, Hawkins, O'Brien's, Speed's, Neer's are all positive. What pathology do you suspect?

6) Are there any other conditions that need to be eliminated as causes of her pain to ensure appropriate treatment and care?

7) How do you manage this situation?

THE ELBOW AND FOREARM

Arm Injury

In January, 10 days into baseball practice, an outfielder approaches you complaining of pain around his biceps. He says he has been sore from the 3 hour practices, and it just seems to be getting worse, so he thought he would talk to you.

1) How do you initiate your evaluation? Are there any specific questions you would ask this athlete?

2) He indicates that every year at the beginning of the season, his arm is sore for the first week, but he has never been "injured". He has just been participating in team practices which consist of a 3 hour practice and weights 3 days a week. His arm hurts around his biceps, but it hurts deep, not over the top of his biceps. It aches, and sometimes is sharper when he warms up or tries to throw hard. He feels it the most when he throws, but is still aware of an ache in his arm throughout the day. What is your next step in evaluation?

3) Observation reveals nothing significant. His throwing mechanics are good. Palpation reveals that neither the biceps muscle belly, nor the biceps tendons are TTP. However, he is TTP posterior to the biceps, along the distal one half of the humerus. Firmness is noted. How do you continue your evaluation?

4) His ROM is full. He has full strength in his shoulder. He has full strength in elbow flexion and extension. However, he is 3/5 with elbow flexion in pronation. Based on your findings, what type of pathology do you suspect?

5) How do you differentiate the pathology given in #4?

6) Pain is also noted with passive elbow and shoulder extension in supination. What pathology do you suspect?

7) How do you manage this pathology?

Forearm Injury

(This scenario may require unconventional thinking.)

A wrestler enters the athletic training room stating that his arm "feels funny". He has episodes where he cannot grip anything and his arm sometimes tingles. He does not remember when it started. It has been gradually getting more constant and severe.

1) How do you initiate your evaluation?

3) He has had no previous arm injuries. He thinks he has only had problems from his elbow down. He is most uncomfortable during the second half of wrestling practice and while typing a paper or taking notes in class. Observation reveals nothing significant. Arms are bilateral in size; and his posture, while not perfect, does not have any major flaws. What is your next step in evaluation?

4) He has full ROM, however he has tingling with end-range elbow extension. His grip strength is diminished when compared bilaterally. Gripping also produces a tingle. With manual muscle testing he is 5/5 with tingling in wrist extension and 4/5 with tingling in wrist flexion. He is 4/5 in pronation. How do you determine the location of his tingling?

4) There were no significant neck findings. However, he tingles in his forearm, palm, thumb, index and middle fingers. Does that indicate any nerve? If so, which one?

5) Would you perform any palpations on this athlete? Why or why not?

6) Palpation of the pronator teres recreates his tingle, only to a lesser degree. Could this indicate anything?

Elbow Injury

During a basketball game, a post players goes going up for a rebound. He loses his balance and falls to the floor, hitting his elbow. After a second, he gets up and continues to play, after flexing and extending his elbow a few times. At half time he approaches you and just shows you his elbow. His elbow looks grossly deformed. He looks like he grew a golf ball off the point of his elbow.

1) What is your first course of action?

2) He has no previous elbow injuries or medical conditions. There are no separations in the long bones of his upper arm and forearm. The tip of his elbow feels firm, but squishy. What is your next step in evaluation?

3) He has full elbow extension. Flexion is limited due to a "tight" feeling, but not from pain. How do you continue your evaluation?

4) He has full myotome and dermatome sensation and function. Are there any tests you would perform?

5) Pinching the tip of the elbow reveals a thicker segment than the contra-lateral side. What pathology do you suspect?

6) Can he return to the game?

7) Are there any precautions that need to be taken?

Arm Injury

One day in the middle of the season, a baseball player enters the athletic training room complaining of "knife like pain in his elbow". He has been hurting for a few weeks.

1) How do you initiate your evaluation?

2) He reports playing shortstop and pitcher. He does not have a history of arm injuries, just basic muscular soreness that he treats with ice. His pain is on the posterior aspect of the elbow, and deeper inside where he cannot touch. Is there any other subjective information that you would like to know? If so, what?

3) He reports when he plays shortstop he throws side arm, and when he pitches he throws mostly sliders. The only difference with his current workout schedule has been his quantity of lifting. He has been trying to bulk up to try and be drafted this season. He has put on 20 pounds since last season. What other information do you need to know about his pain?

4) He reports that only two things make it hurt: after the release when pitching and on short, quick throws from short. It does not hurt during the day. It is a quick, intense, stabbing pain that subsides after its initial burst. Where does your evaluation take you next?

5) Observation reveals swelling on the posterior aspect of the elbow, immediately distal to the joint line. What is your next step in evaluation?

6) He is TTP over his anconeus. What are the attachment sites for the anconeus and what is its action?

7) How do you continue your evaluation?

8) ROM is full. However, with RROM there is pain with elbow extension and pronation. Is your evaluation over? If not, how do you conclude your evaluation?

9) All special tests are negative. What injury do you suspect and what is your course of action?

10) After a week of conservative treatment, there has been no change. Do you change your course of action? If so, how?

11) Physician consult concurs that the athlete has a soft tissue injury. He treats with a cortisone injection. Can the athlete return immediately? If not, why and when can he return?

12) The athlete has relief from his symptoms for two weeks, after which all symptoms return. When his symptoms return, his pain is more intense. What do you suspect and how would you confirm your suspicions?

Elbow Injury

During a high school junior varsity baseball game, while base-running, the short-stop slid head first into second base. After the game, he complains of an achy pain in his elbow.

1) How do you initiate your evaluation?

2) He does not have any previous elbow injuries. He says he slid into the bag with his arms straight. He hit the side of the bag with the base of his palms. He immediately felt some pain in his elbow, he assumed from the impact. Now it aches. How do you continue your evaluation?

3) Palpation of the elbow and surrounding structures is negative. What are your next steps in evaluation?

4) ROM is full, but terminal extension causes some discomfort. Elbow strength is full and non-painful. What is your next evaluative step?

5) Varus and Valgus testing are negative. Terminal extension bounce elicits some discomfort. Do you suspect any pathology?

6) How do you manage this situation?

7) His parents are appreciative of your efforts and candor. They decide to see their physician to be safe. The next week, the athlete returns to the athletic training room with a letter saying x-rays were negative, and the physician thinks the joint was just irritated from the axial load. He placed no restrictions on the athlete, who says he feels okay. He returns to play. One month later, the athlete returns to you complaining of pain "in" his elbow. He says he cannot touch it, but the closest he can get is over the front of his elbow joint. He says sometimes his elbow catches on him when he bends it. What is your next course of action?

8) What is your first step?

9) You cannot replicate his pain with palpation, but he is apprehensive when you palpate his anterior elbow. What are your next steps in evaluation?

10) ROM testing is limited in full elbow flexion terminal extension, and supination. A catching is felt both with passive and active flexion and extension. What is your next step in evaluation?

11) Varus and Valgus testing are negative. Terminal extension bounce creates some discomfort. What pathology do you suspect?

12) How do you manage the situation?

Elbow Injury

A baseball pitcher approaches you during practice. He tells you about this "weird" sensation he has in his elbow. He has noticed it for the last 2 days. He likens it to nerve pain that he has previously had in his ulnar nerve, only now the sensation is on the "other" side of his elbow. (He indicates the lateral epicondyle and extensor attachment.) He can palpate the site of his discomfort, but to him it is in a "weird place".

1) Is the athlete's history complete? Are there any other questions that should be answered?

2) He indicates that the sensation is not painful, "just weird; and it feels like a nerve pain". He feels it when he throws. It starts where he indicated, but it shoots down his forearm into the back of his thumb. Is this information sufficient? If not, what would make it complete?

3) He practices his throwing motion and indicates that he starts to feel it just before release, when he is trying to snap the ball off. How do you continue your evaluation?

4) Coach agrees that his mechanics are good and nothing has been altered. He keeps his elbow up during the acceleration phase. You are able to replicate the athlete's complaint. His area of tenderness is between the olecranon and the lateral epicondyle. His pain is posterior to the lateral epicondyle. You can snap over a rope-like structure. He indicates that snapping as a replication of his symptoms. Palpation of his extensor group reveals increased tone with crepitation. What structure(s) could be the cause of his pain?

5) What are your next steps in evaluation?

6) His elbow range of motion is full and non-painful. His wrist flexion produces mild pain in the extensor group (when the elbow is straight). Wrist extension is full and non-painful. Strength is full in every muscle group. Is there a next step to your evaluation? If so, what would you do, why? What injuries do you suspect?

7) Varus and valgus testing of the elbow is negative. Tinel's is negative. What pathology do you suspect?

8) What would be your rehabilitation goals for this athlete?

Elbow Injury

Early in the softball season, a pitcher enters the athletic training room complaining of pain in her dominant forearm. The pain has come on gradually. She does not remember when she first felt it or the possible cause. He forearm hurts off and on throughout the day and consistently during activity. She has not been able to determine a pattern for her pain.

1) Is your history complete? If not, what is needed for completion?

2) She has never before injured her elbow or forearm. How do you initiate your evaluation?

3) Observation does not reveal any significant findings. Palpation reveals tenderness along the mid-shaft of the radius, proximal to the insertion of the brachioradialis. What are your next steps in evaluation, and are you looking for any specific signs or symptoms?

4) ROM is full, as is strength. However, there is pain with resisted pronation, elbow flexion and wrist flexion. There is slight discomfort with elbow and wrist extension. Are there any special tests that should be performed on this athlete? If so, what? If not, why?

5) What pathology do you suspect based on your findings?

6) How would you manage this pathology?

7) Initially, a compression wrap on the forearm helped reduce symptoms. Rehabilitation on the pronators, brachialis and brachioradialis showed an increase in strength, and a gradual reduction in symptoms. However, as the season progressed, her pain became more constant, and difficult to manage. What is your next course of action? Why?

Elbow Injury

The softball team returns from a tournament where they traveled without an athletic trainer. One of the outfielders injured her elbow while diving for a ball. She was evaluated by an athletic trainer at the tournament, but does not remember what she was told. She is now two days post injury. She has been in unrelenting pain and splints her arm to her body.

1) How do you initiate your evaluation?

2) She reports that she has never injured her arm before. In fact, she has never been injured in her athletic career. She does not want to remove her arm from her side, but you convince her to sit down on a stool with her arm out on the table so that you can see her elbow, but still have it protected. She presents with moderate swelling and severe ecchymosis. What are you going to pursue next with your evaluation and what injury do you suspect?

3) Palpation is counterproductive as everything hurts her. What do you try next in evaluation?

4) She is unwilling to move her arm, so AROM and strength are immeasurable. PROM reveals a range of 30-90 degrees. What is your next step in evaluation?

5) Stress testing is nearly impossible due to the athlete's range and pain. Varus stress testing at 30 degrees is negative, but you cannot get the athlete to zero degrees. Valgus stress test at 30 degrees produces significant gapping with a boggy end-point and considerable pain, after which the athlete does not want you touching her anymore. What is your impression of the injury?

6) How do you rule out your suspicions?

7) What do you do to make the athlete more comfortable?

THE WRIST AND HAND

Wrist Injury

During the fall, a tennis player enters the athletic training room complaining of pain in her wrist.

1) What is your first step in evaluation?

2) She has never hurt her wrist before. She noticed her wrist pain a couple weeks ago, but it was not that bad, so she ignored it, thinking it would go away. Instead of going away though, it got worse. Her wrist now hurts "all the time". The only thing different she has done is change her grip on her racquet. What is your next step in evaluation and what type of pathology do you suspect she might have sustained?

3) Observation reveals mild swelling over the radial aspect of her wrist. She is TTP over the radial styloid and the extensor pollicis brevis and abductor pollicis longus tendons. Crepitus is felt. There is no tenderness over her lateral or medial epicondyles or flexor/pronator or extensor origins or muscle bellies. What pathology do you suspect?

4) What are your next steps in evaluation?

5) Wrist and thumb ROM are full. Pain is noted in the following directions: active radial and ulnar deviation, passive ulnar deviation, active and passive thumb flexion and adduction. Strength is full, but painful. What one special test would you perform in this evaluation?

6) Regarding the test given in #5, is this test conclusive?

7) What pathology do you suspect? Is it the same or different from the pathology listed in #3?

8) Describe the suspected pathology.

Hand Injury

After striking out at his at bat during a game, a baseball player approaches you, stating that he felt a "pop" in his wrist on his last swing. He was unable to carry the bat back to the dug-out with that hand.

1) Is there any other information that would be useful in your evaluation?

2) He has no history of hand injuries. He says the pain is sharp and constant, but worsens when he tries to use his hand. He is right handed, and bats right, but it is his left hand that hurts. Is this information significant to you at this point and why?

3) What are your next steps in evaluation?

4) Observation reveals nothing significant. Palpation of the wrist only produces pain over the hamate. There is a bony clunk in the proximal hypothenar eminence. What is the next step in the evaluation process? What do you think the injury is based on the current evaluation?

5) There is pain with active ulnar deviation, making a fist, and pronation. There is moderate discomfort with a tuning fork over the hamate. What pathology do you suspect?

6) How do you manage the situation?

Finger Injury

During basketball practice, the point guard reached to grab a passed ball, but the ball deflected off the tip of his middle finger. He shows you his finger, which is obviously deformed; and he tries to straighten it, to no avail. His PIP joint is extended while his distal DIP joint is flexed. He complains of pain at the end of his finger.

1) What deformity do you suspect? What is the etiology for the injury you suspect?

2) How do you evaluate this injury to confirm your suspicions?

3) What is a common treatment for this injury?

Hand Injury

During basketball practice, an athlete approaches you at the end of a play. She is holding her hand, obviously in pain. She states that she just got hit by a ball and another player. She felt a pop or snapping sound.

1) How do you initiate your evaluation?

2) She is not swollen, but there is an obvious deformity in the 4th MCP joint. It is depressed palmarly compared to her other knuckles. What is your next step in evaluation?

3) There is a palpable click in the distal metacarpal. What is your next step in evaluation?

4) She is hesitant to move her finger. What are the possible injuries she may have and what is your next course of action?

5) What pathology do you suspect?

Finger injury

After a basketball game, the point guard approaches you and asks if you can tell if anything is broken in her hand. You ask her why she thinks she may have broken her hand, and she says she dove for a ball and jammed her finger into the floor and now her hand really hurts.

1) How do you initiate your evaluation and what do you initially think may be the injury?

2) Her hand is mildly swollen over the distal aspect of her 3-5 metacarpals. What do you evaluate next?

3) Palpation of the fourth metacarpal and phalanx do not produce pain, and no deformities are felt. Palpation of the fourth MCP joint produces pain. ROM is full, but end-range flexion and extension cause discomfort. What is your impression of the injury – what pathology do you suspect?

4) Is your evaluation complete; if not, what is your next step?

5) Stress tests reveal a non-painful firm end-point on the ulnar side, while the radial side produces pain with an open end-point compared to the contra-lateral side. What pathology do you suspect?

6) Will this athlete be able to continue to participate? If so, will any precautions need to be taken?

Hand Injury

During a baseball game, a base runner dove into second base, arms first. When he stood up he was moving his wrist around a little, but stayed out in the field. A couple plays later, after rounding the bases, he approaches you in the dug-out and states that his wrist has been hurting since that dive into second. He indicates that it hurts at the base of his thumb.

1) How do you initiate your evaluation?

2) He is symmetrical bilaterally. What is your next step in evaluation?

3) He is tender in his anatomic snuff box. What are the anatomical barriers of the snuff box?

4) Why is the anatomic snuff box significant?

5) How do you continue your evaluation?

6) He has pain with active wrist extension, especially at the end-range. He is unable to maintain that position with any resistance. He also has pain with radial deviation, both passive and active, as well as passive wrist flexion and extension. He has a diminished grip. What pathology do you suspect?

7) Why is the management of this pathology important?

ILLNESS

Illness

One day, an athlete enters the athletic training room before practice, asking for drugs. She explains that she is sick, and asks if you could give her anything for her cold. She wants to feel better for practice.

1) How do you handle the situation?

2) She started to feel sick yesterday. Her head hurts, she is tired, her throat hurts, and her nose is congested. What other questions would be important to ask? Why would these questions be important?

3) She does not have any other symptoms. If she were a high school student, would you give her anything? Why or why not?

4) She is actually a collegiate athlete. Would you give her any medications? Why or why not?

5) Assuming that you do offer her medications, what type would you offer her?

6) Should this athlete participate in practice today? Why or why not?

7) Today is a lifting day. Should she participate in lifting after practice?

8) The next day, she comes to you before practice again for medication. She looks pale and weak, and her eyes look glazed. Do you medicate her today?

9) She has been either really hot or cold today. Her body has been very achy all day. She has not been hungry, nor has she been drinking fluids. What illness do you suspect?

10) What is your next course of action?

11) Your suspicions are correct. Her temperature is 101. Do you allow her to practice today? Why or why not?

12) How do you manage the situation?

13) When you tell her coach that this athlete is not practicing, she becomes irate. She tells you that it is just a cold. She used to practice through colds, so her athlete can as well. You are just trying to hurt the team by holding her athlete out of practice. How do you handle the situation?

Illness

During the basketball pre-season, one of the athletes looks sluggish on the court. She is the last one to finish running suicides, when she is usually one of the first across the line. Coach spends a lot of time yelling at her because she is so sluggish.

1) Do you approach the athlete and inquire what is wrong during practice?

2) She approaches you after practice looking tired. She tells you she feels tired and has a head-ache. Her head-ache gradually came on during the day, but now it is bad. What do you tell the athlete?

3) She verifies that she has not hit her head on anything. She comes to you the next day and feels a little better. She is hydrated, but she did not sleep well. What do you tell her?

4) She assures you she will be fine. She participates in practice. The week passes with her feeling lethargic, but she thinks it is because she has trouble sleeping. She is insistent that she is okay. The next week she comes to you asking for a throat lozenge because her throat hurts. What is your course of action?

5) She does have slightly swollen glands, but she has no temperature. Are there any conditions you should be worried about at this time?

6) What do you tell the athlete?

7) She does not want to, but she agrees and sits out practice. The next day she tells you she woke up in the middle of the night drenched in sweat. What is your next course of action?

8) What condition do you suspect? Why?

9) Do the symptoms listed in #8 always manifest themselves with the suspected condition?

10) The athlete returns from the student health center and reports that labs were taken, and she is awaiting results. She wants to practice. Do you let her? Why?

11) When the labs results return, they indicate that she has mononucleosis. How long is this athlete out from participation?

SKIN CONDITIONS

Skin condition

During wrestling skin checks, a red circle approximately the size of a quarter is found over an athlete's rib cage. Around the red circle is flakey white dead skin. There are no pustules or other incongruities in the skin.

1) What skin condition do you suspect?

2) How do you differentiate between possible skin conditions?

3) Can this athlete participate?

4) What is the treatment for this condition?

PREVENTION

Prevention

A cross country runner (freshman) enters the athletic training room one afternoon, looking like she is only partially awake. She approaches you, asking to talk. She tells you she is always tired and never feels like she has any energy.

1) What do you initially say to this athlete?

2) She indicates that she has been feeling this tired for a couple weeks. At first she just thought she was sleep deprived. But now, she has trouble staying awake, but she does not sleep well. When she wakes up, she is famished, but craves candy. She has a hard time concentrating, or participating effectively throughout practice. What pathology do you suspect in this athlete?

3) What further questions do you ask this athlete?

4) Yes, she gets head-aches. They are constantly there, but she gets sharp shooting pain in her left eye, which eventually leads her to take a nap. In the morning she eats a bagel, orange, and a powerbar. At lunch she eats a peanut butter and jelly sandwich with chips. For dinner she usually eats pasta. She also states that about 30 minutes after she eats, she gets really tired. She snacks on candy during the day. She has had difficulty being away from home where her mom cooked for her, so she eats what is easy to prepare. Do you see any problems with her diet?

5) Based upon your findings, have your responses to #2 changed?

6) How do you confirm your suspicions or manage this athlete?

Prevention

During entrance physicals, a collegiate cross-country runner is diagnosed with a stress fracture of L4. She indicates that she has never had a back injury or trauma. She is 4'10" and weighs 90 pounds.

1) Do you have any reason to suspect an eating disorder in this athlete?

2) How do you manage the situation?

3) She has difficultly throughout her rehabilitation with refraining from exercise. She constantly works out in the pool, stair-stepper and bike. One day a teammate confides in you that he saw her running on the road that morning. What do you do when you see the athlete that afternoon?

4) She responds that she "has to". She does not know what to do with herself if she cannot run and work-out. She wanted to see if it would hurt to run. She tells you it did not hurt. What do you tell this athlete?

5) When you advise her about eating nutritious food to allow her body to heal itself, she seems anxious and uncomfortable. You notice fine, blond, baby hair over her cheeks. What is your current opinion of this athlete?

6) How do you act on your suspicions? Do you ignore them? Do you confront the athlete?

7) She seems nervous about the suggestion and insists she is okay. But she agrees to go. Will she benefit from only speaking with a nutritionist? Why?

Prevention

At high school football practice during September, your town is experiencing a heat wave. It is about 100-degrees outside with high humidity levels. You have supplied the team with ice towels as well as coolers of ice water. A running back approaches you complaining of calve cramps.

1) How do you handle the situation?

2) He comes off the field about 30 minutes later complaining of dizziness. What is your first course of action?

3) Do you have reason to suspect any heat illness?

4) How do you continue your management of the situation?

5) His skin is pale and wet. His pulse is 90bpm and he is breathing rapidly. His temperature is 101-degrees. What do you suspect based upon your findings?

6) How do you manage the situation?

7) Do you leave this athlete to attend to the sidelines? Why?

8) If his symptoms had been: flushed, dry, hot skin, shallow breathing, rapid pulse, and a temperature of 105-degrees, how would you have managed the situation?

Prevention

A women's field hockey player enters the athletic training room wanting to talk to you. She indicates that she has been feeling "weird" and she thought you might be able to help her.

1) What do you need to know from this athlete?

2) She has been feeling "weird" things for a few weeks, so she made a list because she did not know how, or if, they were related. It all started a few weeks ago. Since it started, she has not felt herself. How do you respond to this athlete?

3) The list includes: constantly cold, gaining weight but not hungry, dry skin (no matter how much lotion she uses), and excessive hair loss on hairbrush. She says she has not had any energy lately. She does not want to spend time with her friends, and going to class is a struggle. She thinks it is a good thing that field hockey is in their off-season, because she does not feel like being physically active. She is scared and does not know what is wrong with her. Do you have any questions for this athlete?

4) Why are these questions important?

5) Nothing significant has happened, other than a change in how she feels. Family and friends are fine. She is not taking any vitamins or medications. Do you suspect any conditions at this time? Why?

6) What other questions do you need to ask this athlete?

7) Her dad has high blood pressure, and her mom takes pills every day to regulate hormones, but she does not know for which hormones. What do you tell the athlete?

Prevention

A men's soccer player enters the athletic training room looking nervous. When you approach him to inquire about what he needs, he anxiously looks around the room at the other athletes, and he does not answer your question.

1) What are your first thoughts regarding this athlete?

2) You ask him if he would like to talk in private, or if he would be more comfortable talking to somebody else. He assures you that you are okay, but he would like to talk in private. How do you handle the situation?

3) Once you are in a quieter location, he still seems nervous. What do you do?

4) He tells you what he has to say is embarrassing. He thinks he has a lump in his scrotum. How do you react?

5) How do you continue your questioning?

6) He just noticed it today, when he was in the locker room. It feels like one testicle is larger than the other by "a bit" but it is difficult to tell how large. His scrotum feels enlarged and pressure is uncomfortable. He has not had any groin trauma, and he does not think there was any blood in his urine. Urination does not hurt. What pathology do you suspect? Why?

7) What do you tell the athlete regarding your suspicions?

Prevention

One of your high school wrestlers comes to you complaining of ringing in his ears. He has a match tomorrow, and is having trouble understanding what is being said to him at practice. He thinks maybe he has an ear infection but he still wants to compete. When you ask him how long his ear has been troubling him, it takes a few moments for him to respond with an answer of a couple days. His demeanor seems lethargic. He is wearing his sweat suit with the hood up, even though it is 80 degrees outside and this practice is banned.

1) Do you think he has an ear infection? Why or why not?

2) What other information will you look for to help you draw your conclusions during the observation portion of the evaluation?

3) The otoscope revealed a shiny, translucent tympanic membrane. He indicates that practice has been especially hard for him this last week. He has been trying to cut weight, so he has not been eating or drinking much, even though he has been working out 3-4 times a day. He has felt weak. How will this affect his wrestling ability?

4) How do you handle the situation?

5) Do you talk to the athlete's coach? Why or why not?

ADMINISTRATION

Administrative

A tennis athlete is diagnosed with multidirectional instability in the fall. She is adamant that she does not want surgery. She wants to play this spring. After discussing all options with the orthopaedic surgeon and the athletic training staff, it is decided that she will try a thorough rehabilitation plan to strengthen her for the season. This is her last year of play. Over the winter she participates in a rotator cuff and scapular stabilization strengthening program, with some success. In January, she is able to play, despite her shoulder's spontaneous popping. At the end of the season, the athletic training staff never sees her. The following year, she reappears. To your surprise, she is playing one more year of tennis. She says her shoulder is the same. It pops, but it does not bother her or prohibit her from playing.

1) Are there any steps that should be taken with this athlete at this time?

2) You rarely see her during the fall. She occasionally comes into the athletic training room for ice after practice. She never complains about her shoulder. It is always "the same", as she says with a laugh. During the season, however, her shoulder starts to deteriorate. The popping becomes more pronounced and constant. She is unable to remain competitive with matches that go into three sets. She complains to you during matches about her shoulder. How do you manage the situation?

3) She never shows up before practice. She also is not consistent about icing her shoulder after practice. Yet she continues to complain when you see her on the court. She complains about other body parts as well and says she wants help. What do you tell her?

4) She never produces a list, and she sometimes comes to see you with 15-20 minutes left before practice, expecting you to "fix" her. How do you handle this situation?

5) She says she will give you the list, and she will come see you tomorrow. You never see the athlete in the athletic training room for the duration of the season. At the completion of the season, she comes to see you and cries that she just cannot take it anymore and she wants surgery. How do you respond to this athlete?

6) You feel she has been irresponsible by not making her shoulder a priority. You want to tell her the school will not cover her surgery. Can you withhold surgery?

Communication

Three nights before you leave with a team on a road trip to your home town, you find out from one of your athletes that you are no longer going on this trip. That day at their team meeting, the head coach had asked the team if they felt the athletic trainer really needed to go, or if the athletes could be treated by the host athletic trainer instead. You are devastated. You have family in both cities you would be visiting on this trip, and had already made arrangements to see them in your free time. For the last 2 years you have worked with this team, and you have traveled to every away game. You had been told again at the beginning of this season that you would travel on every road trip with the team.

1) How do you handle the situation?

2) Your coach informs you that she has decided not to take you on the trip. What is your response?

3) She tells you the decision was not personal. If the team had felt that they needed you, she would have taken you. She wants to make sure that this is not going to affect how you treat the team. What is your response?

4) When the team gets back from the trip, the coach returns the traveling kit, as well as the traveling kit for the men's team, without an explanation of why she has both kits. She proceeds to question you regarding the contents of their travel kit. You had stocked 2 inch tape and the other athletic training rooms had complained. Did you not use 1 ½ inch tape? You had included tape cutters, but they would also like scissors. Lastly, the team has been sick and they would like drugs in the kit on the next trip. How do you handle this request?

5) She is angry when she responds that the men's kit had medications. The men are obviously receiving preferential treatment. What do you tell her?

6) When you are preparing the team for practice that day, some of the athletes tell you that they had stood up for you and told the coach that they needed you there to tape them and take care of them. They had missed you over the week-end. Do you take this matter to the coach? Why or why not?

Ethical Issues

One of the women's basketball post players has a finger deformity that requires splinting. The athlete's injury has been discussed and a decision was made, with the medical team and the athlete that she could continue to play as long as her splinted finger was also buddy taped. She practiced with the 4-5 digits of her non-dominant hand taped during the week. During the first half of Friday night's game, the first game since the injury, she comes off the court ripping the tape off her fingers.

1) How do you handle the situation?

2) You are standing behind the bench, and she is unresponsive as you attempt to get her attention to talk to her. What do you do?

3) She starts yelling at you to leave her alone. She cannot play with her fingers taped together. How do you respond?

4) She stands up and starts cussing at you. She tells you that you need to leave her alone, that you need to pay attention to the game, where your attention should be. She tells you to stay "over there" where you belong and stop telling her what to do. What is your response to this athlete?

5) The coaches back your decision. They inform the athlete to tape her fingers back together. The athlete approaches the coaches to show them that her finger is already taped into her splint. The coaches call you over to inquire if the athlete needs more tape than the already splinted finger. You inform them that her fingers need to also be taped together. They understand. At the beginning of half time, the athlete runs into the athletic training room to get tape, while ignoring you. At the end of half time, the athlete warms up with the team and continues to ignore you. How do you handle the situation?

6) The coaches force the athlete to come over to you. The athlete belligerently shoves her hand in your face. How do you handle the situation?

7) The tape is adequate. What do you tell the coaches?

8) The next night during warm-ups of a game, you watch this athlete to see if her fingers are taped together since she never came into the athletic training room before the game. They appear to be taped together. However, when she comes out of the game during the second half, you see her fingers are no longer taped together. How do you handle the situation?

9) She tapes them together. Are there any steps that need to be taken in the future regarding this athlete's attitude?

MODALITIES

Modality

During volleyball practice, you watch a player dive for a ball. She is slow to stand and is staring at her hand and moving it slowly. She approaches you immediately. She complains of pain and inability to make a fist. She says her hand is "tight, like from swelling". You observe a red, visible tumor over her 2nd MCP joint, which is point tender. Her AROM is limited by pain and swelling. PROM is limited by swelling.

1) What modality would be most beneficial for this athlete at this time?

2) Why would you use the modality chosen in #1?

3) What methods of treatment would be appropriate for this athlete, and why?

4) How long should the athlete use the modalities described in question #3?

5) What temperature must the skin be in order to obtain therapeutic benefits?

6) What are the physiological effects of the chosen modality on pain?

Modality

One of your women's soccer players is one-week post ACL autograft reconstruction. She was home for the first week after surgery, and did not do any therapy other than icing her knee occasionally. She complains of extreme pain and inability to move her leg because of the swelling in her knee. Observation reveals severe swelling in her right knee, with the skin appearing pink and distended. Her skin is warm to touch. Despite swelling and redness, there does not appear to be any signs of infection.

1) What is an autograft reconstruction, and would that have anything to do with her pain and swelling?

2) What electrical modality would be most beneficial for this athlete at this time?

3) Why would you choose that electrical modality over others, and what would other modalities do for treatment?

4) For what purpose would you choose the modality in question #2?

5) What treatment parameters would you choose to accomplish this goal?

6) Is the polarity setting on an electrical modality important, and why?

7) What pad placement pattern would you use for this athlete?

Modality

A basketball player diagnosed with a navicular stress fracture is in phase I of the rehabilitation process.

1) Would you incorporate Low Level Laser (LLL) into the rehabilitation process?

2) What are the physiological effects of LLL?

3) Knowing the effects of LLL, why would it be effective on navicular stress fractures?

4) For what other conditions would LLL be beneficial?

5) During what phase(s) of the inflammatory process should this modality be incorporated?

Modality

You are evaluating a 25 year old UPS employee who is currently on workers compensation for an erector spinae strain from improper lifting. He is 2 days post initial injury. He has been referred to physical therapy by his physician and is on pain medication. Today has been his first time out of bed since the injury. He walks in spinal flexion. He complains of pain and the inability to stand straight up. He cannot find relief from his discomfort. He has mild swelling over his right erector spinae and is point tender on the right side as well. AROM and PROM are limited by pain.

1) Would you use TENS on this patient?

2) What would indicate that TENS could be appropriate for this patient?

3) TENS may be set up many different ways, but regardless of the method used, TENS affects what physical structure?

4) What theory supports the use of TENS? How does that work?

5) What are the protocols for the various methods of TENS?

6) Where is electrode placement for TENS?

7) For this patient, where would you place the electrodes?

8) What are the contraindications for TENS?

Modality

Two weeks after sustaining an ATF sprain, an athlete has progressed into the second phase of rehabilitation. He complains of pain, weakness and stiffness when walking. He has difficulty with movement, especially when he wakes up in the morning. His gait is non-painful, but he walks with a limp due to stiffness. There is mild localized swelling around the ATF. ROM is almost full in all directions, and strength is 4/5 in all directions.

1) What modality would have the most effect on this athlete at this time?

2) What are the indications for the use of that modality?

3) Why would you choose this modality over another?

4) What treatment parameters would you choose for this modality?

5) What is the appropriate temperature for the desired method in question #4?

6) What is the treatment time?

7) What are the contraindications for this method?

Modality

A 19 year old men's basketball player has been diagnosed with patellar tendonitis. He has had this condition for approximately 2 months. He currently complains of pain inferior to his patella during and after practice, as well as walking up and down stairs. He is point tender at the inferior pole of the patella.

1) Would you perform ultrasound on this athlete? Why or why not?

2) What is your therapeutic purpose of ultrasound in this case?

3) What settings would be appropriate for this injury?

4) What size ultrasound head would you use for this body part?

5) How big of a treatment area do you want to target?

6) What coupling agent should be used?

APPENDIX H

Sports Medicine Case Scenarios Instructors Manual

INTRODUCTION

The following is a set of 100 athletic training case scenarios to use with your athletic training students. The majority of the cases presented did happen to various certified athletic trainers. The purpose of the case scenarios is to offer the athletic training student some familiarity with athletic injuries or situations that other athletic trainers have experienced. These experiences may be a rare situation that the athletic training student may never experience in a career, or they may be of a more common occurrence. The goal of the cases is to familiarize the athletic training student with the situation presented so they become more comfortable with correct and incorrect management techniques.

The cases are grouped into the type of situation each case represents: emergency care, evaluation and rehabilitation, modalities and administration. The emergency care groupings are injuries that either are emergency situations or situations that need to be evaluated as an emergency due to the range of possible pathologies. The group on evaluation and rehabilitation are integrated because some cases involve various rehabilitation questions about the given case. This group also includes cases about skin conditions, illnesses and prevention of a more systemic nature. The administration section deals with cases regarding ethical considerations, guidelines, and communication. The group on modalities incorporates the athletic training students' knowledge of the appropriateness of the use of a given modality, as well as the specific parameters that would be used. All cases are in alphabetical order, within their given group.

The format presented in the student book only includes the beginning scenario and the questions that follow, while presenting more information for the student as necessary. The instructors' book includes suggested answers, or appropriate responses, as well. The answers will need to be evaluated on an individual basis to account for teaching style. At the conclusion of some of the emergency care cases where the scenario presented multiple possible injuries, a description is offered describing the pathology sustained. At the end of the instructors' book, the table of contents for the student book is offered, as the student book never identifies the sustained pathology and the page numbering is different as the student book excludes the answers. With a copy of the student table of contents pagination, the instructor can more readily inform students which case scenario to complete.

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GLOSSARY OF ABBREVIATIONS

ABCs	Airway, Breathing, Circulation
AC	Acromioclavicular
ACL	Anterior Cruciate Ligament
ADLs	Activities of Daily Living
AROM	Active Range of Motion
ATF	Anterior Talofibular Ligament
ATR	Athletic Training Room
BPM	Beats Per Minute
CF	Calcaneofibular Ligament
CWP	Cold Whirlpool
DIP	Distal Interphalangeal joint
ER	External Rotation
HP	Hot Pack
IR	Internal Rotation
ITB	Iliotibial Band
LCL	Lateral Collateral Ligament
LOC	Level of Consciousness
MCL	Medial Collateral Ligament
MCP	Metacarpophalangeal Joint
MHZ	Megahurtz
MMT	Manual Muscle Testing
MT	Metatarsal
MTP	Metatarsophalangeal
MTSS	Medial TIbial Stress Syndrome
NSAIDs	Non-Steroidal Anti-Inflammatory Drugs
NWB	Non-Weight Bearing
PFD	Patellofemoral Dysfunction
PIP	Proximal Interphalangeal Joint
PROM	Passive Range of Motion
ROM	Range of Motion
RROM	Resistive Range of Motion
SC	Sternoclavicular
SI	Sacroiliac
SLAP	Superior Labrum, Anterior Posterior
STM	Soft Tissue Mobilization
TFCC	Triangular Fibrocartilage Complex
TFL	Tensor Fascia Latae
TTP	Tender to Palpation
US	Ultrasound
VMO	Vastus Medialis Oblique
WNL	Within Normal Limits
WWP	Warm Whirl Pool

EMERGENCY CARE

Appendicitis

One of your hammer throwers comes into the athletic training room one afternoon complaining of possible food poisoning from breakfast. About 5 hours earlier, he had a stomach ache and went to the health center where he was given antacids. Now his pain is worse and he feels hot and nauseous. He indicates his right lower gut as the site of pain. He has gotten some relief from lying on his couch with his legs propped up on pillows.

6) What structures could be causing the pain?
   - Ascending colon
   - Appendix
   - Bladder
   - Kidney stones
   - Genitourinary system

7) How do you evaluate this complaint?
   - Visual observation for abdominal rigidity
   - Palpation for abdominal rigidity
   - Rebound test
   - Auscultation for bowel sounds

8) Rebound test is positive and his abdomen feels distended at McBurney's point. Where is McBurney's point?
   - Between the ASIS and the umbilicus

9) What do you suspect is the problem and how do you handle the situation?
   - Appendicitis
   - Contact the health center regarding your findings and send him back for re-evaluation
   - Or send him to the hospital

10) If he requires surgery, can it be performed right away? Why or why not?
   - No: because of ingestion of the antacids

This athlete suffered from a ruptured appendix and required surgery.

Cervical Fracture or Dislocation

During a high school football game, an athlete comes off the field, walking slowly and walks directly to you. He looks dazed and scared. He tells you that he feels like his head is going to fall off.

12) What is your first course of action?
    - Immediately lie the athlete down behind the team, leaving on his pads and helmet

13) Why is your response in #1 your first course of action? What injury do you suspect?
    - The athlete's complaint is indicative of a serious cervical injury, either a cervical dislocation or a severe fracture
    - Shoulder pads and helmet can help to stabilize the area; removing the apparel would also jostle the athlete when he needs to remain stable

14) What is your next course of action?
    - Activate the emergency action plan and call 911 for immediate transport

15) What other immediate actions need to take place?
    - Stabilization of the athlete's head
    - Instruct the athlete not to move and to stay calm

16) How should your demeanor outwardly be displayed? Why? What will you tell the athlete is occurring?
    - Calm and soothing to the athlete
    - This is a serious condition and situation. However, the athlete needs to remain perfectly calm. There is no need to panic the athlete which would make the situation more difficult to control, and might cause permanent physical damage.
    - Tell the athlete your actions are a precaution until you know of what is the cause of his "feeling" in the neck.

17) What other steps should be taken while you await the paramedics?
    - Notification to the athlete's parents regarding his condition

18) He indicates that his parents are not at the game. They are home. How do you handle that situation?
    - Ask the athlete for his home number and have an appointed person call his parents to inform them of their son's present condition. If necessary, the phone can be held up to your ear so that you can communicate the situation while continuing c-spine stabilization. Remain calm and assure them that he

is awake and stable, but he has sustained a serious neck injury that requires him to be transported to the hospital immediately. Suggest that they meet him at the hospital.

19) What other steps should be taken while you wait?
    - Sensory testing and limited motor testing (no motions are to be performed that may disrupt his stable position) to determine any current c-spine deficits

20) Explain how you perform that task.
    - Ask him to wiggle his feet and hands
    - Sensory testing at:
        - C5 – over the deltoid and lateral upper arm
        - C6 – down the radial aspect of the forearm into the thumb
        - C7 – over the middle finger
        - C8 – over the ulnar aspect of the forearm into fingers 4-5
        - T1 – over the medial aspect of the upper arm
        - L1 – over the anterior hip
        - L2 – over the proximal thigh
        - L3 – over the distal thigh
        - L4 – over the medial crurus and hallux
        - L5 – over the tibialis anterior and middle toes
        - S1 – over the peroneals and little toe

21) Full sensation is noted in all areas. What does that indicate?
    - Presently the spinal cord has not been injured

22) When the paramedics arrive, do you relinquish your position at the athlete's head? Why, or why not?
    - Know your state laws regarding this situation. Two possibilities exist.
    - No. The person at the head stays at the head to protect the athlete from moving during a change in position. Despite what the paramedics may tell you, never release the head.
    - Yes. As long as the athlete's position remains stable and a change in position can be accomplished, a paramedic will have more practice at spine-boarding a patient.

Clavicular Fracture

During a high school wrestling tournament, you are called to attend to an injury on a mat. You did not see the injury. When you arrive at the mat, there are people standing around an athlete, who is also standing.

8) How do you initiate your evaluation? Do you ask bystander what is occurring?
   - History
   - The bystanders identify themselves as coaches and officials. They state that they believe he hurt his shoulder.

9) The athlete explains that he had been picked up by his opponent, and taken down to the mat, landing on his shoulder. He immediately felt a "pop" in his shoulder, almost like his shoulder started to pop out, but popped back. He has never injured his shoulder before. He is scared to move his arm because it hurts, and he is splinting his right arm to his body. What is your next step in evaluation? What do you suspect at this time?
   - Observation
   - Glenohumeral subluxation

10) Observation findings are not significant. He had pulled his singlet down to his waist, making bi-lateral comparison easier. Due to his body type, only the proximal 1/3 of his clavicle is well defined. Both clavicles are even. There is no deformity in his shoulder. What is your next step in evaluation?
   - Palpation

11) With palpation, do you palpate the suspected trauma area first, or do you verify the integrity of the surrounding structures first? Why?
   - Verify the integrity of the surrounding structures first
   - Palpation of the suspected area should cause pain. Causing pain may result in the athlete not wanting you to touch him/her again, and may skew the rest of the evaluation. It is better to rule out surrounding structures first and then zone in on the suspected area of injury.

12) Based upon the information offered by the athlete and your current findings, what pathology(s) do you suspect?
   - Shoulder subluxation
   - AC sprain

13) Palpation of the SC joint is negative. Continuing laterally along the clavicle, the middle 1/3 of the clavicle feels mushy and elicits pain in the athlete. Does this indicate anything significant, or is this a normal finding?
   - Indicates a clavicle pathology, probably a fracture

14) Do you continue your evaluation? If not, what is your next course of action? If so, how do you continue your evaluation?
    - No
    - Splint the arm with either an arm splint or swath the arm to his body to immobilize the area
    - Physician referral for x-rays and evaluation
    - Given that this athlete is a minor, his parents need to be contacted

This athlete sustained a fracture to the middle 1/3 of his clavicle.

Colles Fracture

During a junior high track meet, while observing the high jump pit, you watch as a jumper misjudges his space, and after clearing the bar, falls off the pit onto the rubberized track. As he falls, he puts out his hand to catch himself. You hear him cry out in pain as he collapses on his arm.

5) What is your first course of action?
   - When you reach him, try to calm him down.

6) What is your next course of action?
   - Ask him where he hurts
   - Observation

7) He says his arm hurts. He then begins to get hysterical after looking at his arm. Observation shows a gross deformity. His wrist is displaced dorsally in relation to his forearm. How do you handle the situation?
   - Remain calm
   - Advise the athlete to not look at his arm and to think about being somewhere else, or have another medical person distract him by asking questions and block the site of injury
   - Palpation to try to determine the location of the displacement

8) Palpation reveals that the distal aspect of the radius is also displaced dorsally. Discontinuity is also noted over the distal ulna. What is your next course of action?
   - Splint the fracture

5) What type of splinting materials would you use and not use, why?
   - Would use a Sam splint because you can form it any way you need
   - Would use a vacuum splint because it supports the arm without putting pressure on the limb
   - Would not use an air splint because it puts pressure on the arm and can further displace the fracture site
   - If needed, a piece of wood with a wrap

6) What is your next course of action?
   - Verify the presence of the radial pulse
   - Monitor for signs of shock

7) Why is #6 a vital step?
   - If a pulse is not present, the condition becomes a medial emergency, not a medical urgency and paramedics would need to be called.

8) As you ask if his parents are at the meet, they approach you. What do you tell them?
   - Their son broke his wrist. He needs to be taken to see a doctor for x-rays and casting. Advise them to remain calm and not get hysterical in front of their son. He is already having a hard enough time. Ask them if they are comfortable transporting him themselves, or if they would prefer you to call an ambulance, which would be billed to their insurance.

9) They are comfortable driving him. What type of fracture do you suspect? Describe the fracture.
   - Colles fracture
   - A break of the distal radius, usually 1.5 inches from the distal aspect of the radius; appears as a reverse dinner fork deformity

Compound Tibiofibular Fracture

At football practice, during a walk-through, a recruit trying to impress the coaches administered a hit to the starting center. The recruit led with his head, hitting the center on the lateral aspect of the leg, distal to the knee. The center collapsed on the ground, screaming, while blood spurted from his leg.

7) What is your first course of action?
   - Direct pressure to the lower leg at the site of the spurting blood to limit blood loss

8) Observation reveals the tibia has punctured through the skin. What other steps need to be taken to control the situation?
   - Call 911 for transport
   - If direct pressure does not stop the bleeding sufficiently, apply pressure to the femoral artery to limit blood flow to the leg

9) How is the femoral artery located?
   - The femoral artery passes through the femoral triangle which is formed by the inguinal ligament, sartorius, and adductor longus and can be palpated as it crosses the crease from the abdomen to the thigh.

10) While waiting for transport, what other medical conditions need to be considered?
   - Treat for shock
     - Monitor vitals
     - Keep warm (cover with a blanket)
     - Keep the athlete calm
     - Keep the athlete talking
     - Control breathing

11) What are the warning signs for this condition?
   - Rapid, weak pulse
   - Decreased blood pressure
   - Rapid, shallow breathing
   - Excessive thirst
   - Nausea and vomiting
   - Pale, bluish skin
   - Restlessness or irritability
   - Drowsiness or loss of consciousness

12) Once the paramedics arrive and prepare to transport the athlete, should the person applying pressure to the spurting blood vessels let go for any reason? Why or why not?

- Once the paramedics arrive, the scene is relinquished to their authority. It is their decision how to splint the area, if the pressure needs to be maintained manually, or if they have other options available.

Concussion

A high school football player takes a hit during practice. You are too far away to see exactly what happened, but the other players pile onto the tackled athlete. After being helped to his feet by a teammate, he stands there, looking around. He does not join the huddle. His coach calls him off the field to yell at him for being lazy. You approach the athlete to make sure he is okay. He says he is fine.

2) Do you perform an evaluation? If so, why and what do you suspect?
   - Yes: he is a minor, so your approach needs to err on the side of caution
   - Head injury

7) What is the initial test during the evaluation that you perform?
   - Cranial Nerves: smell, visual accuity, pupil reaction, eye tracking, opening and closing jaw, smiling and frowning, balance, swallowing, shoulder shrugs, and tongue movement; demeanor, memory test, nausiousness

8) Evaluation reveals all nerves are in-tact. The athlete is oriented to time and place, but when you ask him what his name is, his response is, "Pee-Wee Herman". How do you manage the situation?
   - Hold the athlete out and re-evaluate later during or after the game

9) Thirty minutes later, your re-evaluation indicates no signs or symptoms. What injury may your athlete have incurred?
   - 1 degree concussion, assuming there was not loss of consciousness when he was tackled

10) If this athlete does have the injury described in question #4, should he be restricted from participation? How do you assess when the athlete may return?
   - Yes
   - Timing will vary depending on which guidelines you adhere to. However, the athlete is not allowed to return until the resolution of all symptoms or whenever the physician indicated.

11) Should this athlete be referred to a physician? Why or why not?
   - Yes: he is a minor, no risks should be taken

Detached Retina

During a baseball game a pitcher released a fastball, the ball was then hit and lined back to the pitcher, striking him in the face, specifically the orbit of his eye. He fell backwards on the mound and lay unmoving on the ground.

2) When you get to the mound, what is your initial evaluation?
   - C-spine stabilization
   - ABCs
   - Establish level of consciousness

8) Why would you stabilize his c-spine?
   - As a safety precaution because a c-spine injury has not yet been ruled out
   - Unconscious athletes are presumed to have a c-spine injury

9) The athlete is unresponsive to verbal stimuli. His eyes are closed, with his right eye immediately swollen, and he has not moved. What do you do at this point?
   - Call 911

10) The athlete is breathing and his pulse is rapid and weak. Paramedics are on their way. While you are waiting, what course of action should you take?
   - Monitor vitals
   - Crowd control
   - Maintain c-spine stabilization

11) After about a minute, the athlete begins to stir and becomes responsive. Do you release c-spine stabilization?
   - No, not before ruling out a c-spine injury

12) He asks what happened and complains of pain in his head. He tries to open his eyes and states that things look weird. When you ask him what he means by that, he says it was like somebody dropped a curtain before his eyes. What injury do you suspect?
   - Detached retina
   - Orbital blow out
   - Possible intra-cranial bleed
   - Concussion

Femoral Condyle Fracture

During a defensive line drill at high school football practice, a tackled player falls into another player, hitting him from the posterior lateral side, causing him to fall prone. He is unable to get back on his feet.

10) When you get to him, how do you initiate your evaluation?
    - History: location of the pain

11) He says his foot was planted when he was hit and he felt a "pop". Now he has unbearable pain in his knee. He is completely unwilling to move it or bear any weight. How do you continue your evaluation?
    - Observation

12) His knee is immediately swollen, resembling a grapefruit. It is very hot to touch. What is your next step in evaluation?
    - Palpation

13) He is only point tender over the medial femoral condyle. Do you remove him from the field? Why or why not?
    - At this point, no. You need to determine the extent of the injury and the stability of the athlete's condition before he should be moved.

14) What is your next step in evaluation?
    - Special tests

15) After convincing him to relax and give you his leg, you perform your special tests. Varus and Valgus stress testing produces pain, as does Lachman's. Anterior drawer produces pain, but no laxity. All the pain he feels is around his medial femoral condyle. What other tests would you perform?
    - Meniscal testing

16) McMurray's produces immense pain with medial stress, as does forced flexion or hyper-extension bounce test. What pathology do you suspect?
    - Medial femoral condyle injury
    - Osteochondral defect

17) How do you manage the situation?
    - Immobilization
    - Physician referral for x-rays and treatment

18) After physician evaluation, the athlete is diagnosed with a medial femoral condyle fracture. Knowing that, was your evaluation appropriate, especially in regards to questions #5 and #6? Why?
    - No
    - With a fracture, or suspected fracture, stress tests should not be performed because they might disrupt the stability of the fracture.

Humeral Shaft Fracture

During a soccer game, two girls went up to head a soccer ball and collided in the air. One of the girls had her legs knocked out from under her, so when she fell, she came down on her side, landing on her bent elbow. She immediately cried out in pain and lay writhing on the field.

10) What injures do you suspect as you run out onto the field?
    - Humeral fracture
    - AC sprain
    - Ulnar dislocation
    - Shoulder dislocation

11) What is your first course of action?
    - Get onto the field to assess the athlete

12) When you reach her, she is lying on her back, with her left arm stretched out to the side. Her arm is obviously deformed. She is crying. How do you manage the situation?
    - Tell her to stay calm, breath slowly, and not to look at her arm
    - Assure her that you are there to help her and take care of the situation
    - Observe her arm to determine the extent of the deformity

13) Her shoulder is abducted approximately 70 degrees. Her elbow is flexed approximately 30 degrees, her hand is supinated. The deformity appears to be at her humerus, which appears shorter, with a lump in the mid-shaft. What is your next course of action?
    - Palpation to verify observation findings and locate a pulse

14) Palpation confirms your observation findings. A radial pulse cannot be located on her left arm. However, her right arm reveals a rapid and strong pulse (85 bpm). What does this information indicate?
    - The brachial artery is being compromised. Immediate attention is required to prevent a possible Volkmann's Ischemic Contracture.

15) What is your next course of action?
    - Call the paramedics for transport

16) What is your next course of action?
    - Splint her arm with either a vacuum or moldable splint

17) What precautions should be taken in this circumstance?

- The distal aspect of the forearm should be left out of the splint to allow the pulse, or lack of a pulse, to be monitored

18) While you await transportation, how do you manage the situation?
    - Make sure the team has returned to the bench
    - Talk to the athlete to keep her calm
    - Watch for signs of shock
    - Re-check vitals every 5 minutes to monitor status

Hyphema

During a game, a baseball pitcher released a fastball, which was lined back to him, hitting his right eye. He is now lying supine behind the mound, in pain, with his hands covering his face. You calm down the athlete and remove his hands so that you can see his face. The athlete is hesitant to remove his hands, but once he does, you see a red rim around his orbit where the ball struck. The athlete's eyes are closed.

5) How do you initiate your evaluation?
   - Begin assessment for a head injury and eye trauma

6) The athlete has no head injury from your evaluation. The athlete opens his eye, and the sclera appears bloodshot. Upon closer inspection, the inferior 1/5 of the iris is not visible due to blood. What medical condition do you suspect?
   - Hyphema

7) Do you continue or terminate your evaluation? Why?
   - Terminate
   - This is a medical emergency, and the athlete must be transported right away. Any other injury incurred would be secondary in importance.

8) What is your next action?
   - Call 911 or arrange immediate referral to a physician

Lumbar Contusion

At a track and field invitational, you watch as your decathlete waits, squatting by the start/finish line for a race to begin so that he can cross the track. He is squatting close to the left side of the shot put ring when you hear people yelling "heads-up". You watch as he does not move, but is suddenly hit with a 16 pound shot in his low back. He fells backwards onto his back with his hips and knees flexed. He does not move.

9) What is your first course of action?
   - Approach the athlete
   - Determine his level of consciousness
   - If he is conscious, instruct him not to move

10) He is conscious and recognizes you right away. He tells you he knows not to move. He asks if he was really hit with a shot because he really hurts. What is your next course of action?
   - Advise him to remain calm and breathe slowly
   - Activate the emergency action plan; regardless of your evaluative findings, he will need to be transported to determine the extent of injury
   - History of previous injuries, medication or other pertinent medical information
   - Get a baseline on pulse, breathing, blood pressure
   - Monitor for shock
   - Initiate lumbar spine evaluation

11) He has never injured his back. Last year he had bilateral inguinal hernia surgery. He is not taking any medication. His pulse is rapid and steady at 90bpm, respirations are 25 breaths per minute, and blood pressure is 100/70. When asked, he can move his toes and feet. Palpation of the lumbar spine reveals all vertebrae are intact, with full sensation felt by the athlete. What is your next step in evaluation?
   - Palpation of the surrounding structures to determine the point of contact and area injured

12) Palpation of the kidneys is negative. Palpation of the SI joint and iliac crest are negative. Palpation of the right lumbar soft tissue musculature is painful and firm to the touch. How do you continue your evaluation?
   - Dermatome and myotome evaluation to determine any possible injury to the sacral plexus

13) List the areas to be examined for each spinal level.

NERVE ROOT	SENSORY TESTING	MOTOR TESTING	REFLEX
L1	Anterior Hip and proximal TFL	Resisted hip flexion	None
L2	Proximal quad and lateral hamstring	Resisted knee extension	Patellar
L3	Distal quad and medial thigh	Resisted knee extension	Patellar
L4	Medial crurus	Resisted knee extension	Patellar
L5	Tibialis anterior and lateral gastrocnemius	Resisted knee flexion	Patellar
S1	Distal peroneals, little toe and Achilles tendon	Resisted knee flexion	Achilles

14) Do you move this athlete before the paramedics arrive? Why or why not?
    - No
    - This is a traumatic injury and there is no need to risk moving him without knowing the extent of the damage. If you tried to move him, he could pass out as well. It is best to leave him in a stable position and wait for the paramedics.

15) What injuries do you suspect?
    - Back contusion
    - Neuropraxia
    - Possible kidney contusion
    - Possible spinal contusion

16) Would you have expected this athlete to be in danger on the left side of the shot-put ring, why?
    - No, especially when he is not directly next to the sector. When the shot is thrown out of the sector, it is usually thrown out on the right, due to the direction the athlete spins prior to releasing the shot. Throwing out on the left would indicate a left handed athlete, or the rare event that the athlete would over-rotate before releasing the shot.

In this case, the shot missed his kidney, spine, and pelvis. He suffered from massive soft tissue injury and neuropraxia in his femoral nerve that lasted a few months after injury.

Lumbar Nerve Root Contusion

During a high school football scrimmage, a running back gets speared in the low back when he is tackled. He immediately drops to his stomach and does not move.

14) What is your first course of action?
    - While the play is finishing, make sure you are on the sidelines, even with his position on the field
    - As soon as the play is over, approach the athlete

15) As you approach, he crawls/drags himself to the huddle, where a teammate pulls him up, but he immediately collapses in a prone position as you reach him. He is conscious, breathing, and asking for help. What is your first step with this athlete?
    - History: what happened, what are his symptoms?

16) He reports that after he was hit, he could not move or feel his legs. But right away, he regained feeling in his right leg, which was why he tried to reach the huddle. He says he cannot feel his left leg. What is your next course of action?
    - Activate emergency plan
        - Call 911
        - Crowd control
        - Do not move the athlete
        - Keep talking to the athlete to keep him calm
        - Continue your evaluation

17) How do you continue your evaluation?
    - Neural sensory and motor testing to his legs as much as his current position will allow

18) He can move his left leg. However, he cannot feel you touching his leg. While waiting for the paramedics, what course of action should you take to stabilize this athlete?
    - Conservative route: do not move the athlete, keep him in his present condition
    - Spine board: after a quick assessment of available assistance, if you are comfortable and a board is available, the athlete may be boarded

19) How do you continue your evaluation?
    - Palpate lumbar spine as much as possible

20) Upon palpation of his lumbar spine, he is not point tender along the spinous processes, but his left paraspinals are rock hard and painful. The paramedics have not arrived yet, what is your next step in evaluation?
    - Sensory testing to try and determine the spinal level involved

21) What spinal level do you initiate your testing at, and where would you need to touch the athlete?
    - L1
    - Anterior hip

22) What is the next level and location?
    - L2
    - Proximal thigh

23) Next level and location?
    - L3
    - Distal thigh

24) Next level and location?
    - L4
    - Medial shin and big toe

25) Next level and location?
    - L5
    - Tibialis anterior and 2-3 toes

26) Next level and location?
    - S1
    - Distal peroneals and little toe

In this case, the athlete suffered nerve root paralysis from the back contusion and resulting spasm. He recovered fully.

Mandible Fracture

During a softball game, a pitch was lined back at the pitcher. She does not have time to react, and the ball hits her in her mouth. She doubles over in pain.

10) What is your first course of action? Do you have to wait for the umpire to let you on the field?
    - Approach the athlete to assess her condition
    - No

11) She is stunned that she was hit and starts anxiously pacing. How do you initiate your evaluation?
    - Attempt to calm the athlete to allow you to perform your evaluation
    - Observation for obvious deformities

12) Teeth number 21, 22, and 31 are all broken. Her gums are bleeding. The left side of her lips and chin are red from being hit. Is your primary evaluation complete? If so, what is your next course of action? If not, what is needed for completion?
    - Yes
    - Remove the athlete from the field to finish your evaluation and allow the game to continue

13) Once she is on the sidelines, what is your next step in evaluation?
    - Palpation

14) Palpation of her broken teeth produces sensitivity in those teeth and gums. All surrounding teeth are stable. Palpation of the left mandible produces pain, and a possible defect area is noted. How do you continue your evaluation? What do you suspect?
    - Jaw ROM
    - Mandible fracture

15) She is able to open and close her jaw. However, it is painful and she cannot open it her usual width. When she closes her jaw, her front teeth fail to line up evenly. What is your next step in evaluation? Are there any tests you would specifically use to differentially diagnose the injuries you suspect in #5?
    - Special tests
    - Tongue Blade

16) The Tongue Blade test is positive. What demonstrates a positive Tongue Blade test finding?
    - The tongue blade is clenched between the athlete's teeth. When the blade is rotated, the athlete is unable to maintain a firm bite on the blade.

17) What pathology do you suspect?
    - Mandible fracture

18) What is your next course of action?
    - Physician referral for x-rays and evaluation

Metatarsal Dislocation

During practice, a pole vaulter came down on the side of the pit, almost missing the pit completely. His right leg did miss the pit, his foot contacting the ground. He is lying on the ground with his hip abducted in external rotation, his knee bent, and his foot dorsiflexed.

2) Of all possible injuries he may have incurred, which are the most traumatic that you would need to rule out immediately?
   - Femur fracture
   - Hip dislocation

7) How do you evaluate this athlete to differentially diagnose the conditions indicated above?
   - Observation
   - Location of the pain
   - Palpation

8) He complains of pain in his foot and ankle. How do you proceed with your evaluation?
   - Remove his shoe (might need to cut the shoe laces to create more space and reduce athlete's pain) for a foot and ankle evaluation

9) His foot is obviously deformed on the lateral aspect, resembling a dinner fork deformity of the wrist. What pathologies do you suspect?
   - Fracture
   - Dislocation

10) Upon closer inspection, his fifth metatarsal appears to be on top of his fourth metatarsal. Do you continue your evaluation? If not, how do you manage this situation?
   - Splint and refer for x-rays and reduction/treatment
   - Once splinting is in place, can continue your evaluation to verify there are no other injuries

11) The athlete is crying out irritably in immense pain. His face looks ashen and he tells you he thinks he is going to throw up. His breathing is shallow. What do you now suspect with this athlete? Does this change your management protocol?
   - He is going into shock.
   - Yes, 911 should be called for transport

In this case the athlete dislocated his fifth metatarsal dorsally onto his fourth metatarsal.

Orbital Blow-out

During a men's soccer game, two players compete for a header, and collide heads. Both players collapse to the ground and lay unmoving.

14) What is your first course of action?
    - Get out to the players on the field
    - Assess their LOC

15) As you approach the players, one sits up and says he is okay. The other remains lying on his left side, with his back to you. What is your next course of action?
    - Assess the status of the player who has remained down
    - Ask the other player to sit on the sidelines until you can accurately assess him for a head injury

16) When you reach him, what are you looking for in your assessment?
    - ABC's
    - LOC
    - Stabilization of his position

17) He is verbally responsive as you talk to him. How do you continue your evaluation?
    - C-spine stabilization until injury is ruled out
    - Question the athlete regarding his pain: where does he hurt? What happened?
    - Observation for obvious deformity

18) His face is covered in blood. He says he hit the other guy's head when he went for the header. His head hurts. He has no c-spine pain upon palpation, no deficits are felt and he has full sensation and motor control in his hands and arms. What does that indicate?
    - The absence of a traumatic c-spine injury

19) How do you continue your evaluation?
    - Begin evaluation for head injury
    - If you have assistance, they can begin to wipe the blood off his face to determine the origin of the blood
    - If you have no assistance, you can either wipe the blood away as you question the athlete if you are comfortable, or you can wait until your questions are finished.

20) Questioning reveals full cognitive functioning. The origin of the blood is a 1 inch laceration located superior to his right eyebrow, on the lateral aspect. What is your next course of action?

- Assess appropriate method to remove him from the field
  - If he is able, he can walk, but he should get up off the ground himself to verify his stability
  - He may need walking assistance
  - Sport chair if necessary
  - Cart if necessary

21) Once he is on the sidelines, is your evaluation complete? If so, why? If not, how do you continue?
- No, the evaluation is not complete
- The primary evaluation was completed on the field. Off the field is the time to perform the secondary evaluation.
- Continue with observation of his head and face now that he is sitting up without blood covering his face

22) Observation reveals the zygomatic arch is depressed on his right side. Is that significant? If so, why? What might that implicate?
- Yes it is significant
- It implicates either a fracture to the arch, or an orbital blow-out

23) Is there a next step to your evaluation? If so, what is that step?
- Yes
- Eye ROM and vision testing

24) He indicates that his peripheral is fuzzy. Both his eyes track the movements of your finger. However, his right eye is unable to look all the way upward as the left eye does. Does that confirm or change your suspicions?
- Confirm

25) What injury do you suspect?
- Orbital blow-out

26) What is your next course of action?
- Physician referral for evaluation and treatment

In this case, he suffered from an orbital blow-out with four fractures, including the zygomatic arch. He had out-patient surgery the next day with an incision through the inside of his upper lip to access the orbit, where they repositioned the bones and packed with area with sterile gauze, which they removed 10 days later. Two weeks post injury, he returned to play-offs, wearing a custom made plastic face shield to protect his eye.

Patellar Dislocation

During a soccer game, you watch one of the male players plant off his right leg to pivot to the left, when he drops to the ground crying out in pain. He rolls onto his left side, holding his right lower leg in his hands.

9) From where you sit, what are the injuries you think he may have sustained?
   - Ankle sprain
   - ACL sprain
   - MCL sprain
   - Patellar dislocation

10) What is your first course of action?
   - Go out on the field to assess him

11) He is crying in pain. How do you handle the situation?
   - Try to calm him down
   - Ask him what happened and where he hurts

12) He says it is his knee. He went to pivot, and he felt a pop. Now his knee really hurts, and it looks funny too. What is your next course of action, why?
   - Observation to determine if there are any deformities and the cause of his knee "looking funny".

13) His knee is flexed approximately 45 degrees, and does look deformed. His knee and surrounding area appears swollen, specifically around the lateral aspect of his knee. The femoral trochlear groove is well defined. How do you continue your evaluation, why?
   - Palpation to determine if there are any disruptions in the femur or tibia

14) The femur and tibia are intact. You are able to palpate the femoral trochlear groove, which is not comfortable for the athlete. There is a hard mass felt on the lateral aspect of the knee. What pathology do you suspect?
   - Patellar dislocation

15) What is the most injured structure with the pathology listed in #5?
   - Medial patellar retinaculum

16) What is the on-field management of the condition listed in #5?
   - Splint
   - Physician referral for reduction

Proximal Interphalangeal Joint Dislocation with Volar Plate Rupture

During women's basketball practice, you, the athletic trainer, observe one of the guards receive a chest pass from across court. Instead of catching the ball into her chest, the ball reflects off her as she doubles over, apparently in pain. As she starts to scream about her finger, you approach her. She holds her hands together and frantically jumps around saying, "It's my finger again." You ask her what she means by "again", and she says she has dislocated this finger before. When you ask her what it looked like before, she says her little finger made an "L" out to the side. She declares she does not want anybody to touch her finger.

2) How do you manage the situation?
   - Try to calm the athlete so that you can look at her finger to determine the extent of injury.

3) After convincing the athlete that she needs to let you look at her finger, she continues to hold her hands together, but turns so that you can see, but not touch, her right little finger. Her finger is obviously deformed, but in the correct linear alignment of the phalanges. Her DIP is flexed and her middle phalanx appears to be on top of her proximal phalanx. What are the possible structures damaged?
   - Bony fracture
   - Collateral sprain
   - Capsule sprain
   - Volar plate rupture
   - Flexor Digitorum Profundus rupture

5) What is your next course of action?
   - Ice
   - Immobilization
   - Physician referral for x-rays and reduction

6) X-rays were negative, and after reduction of the PIP, the finger looks "normal". What do you think the assessment is and how do you treat that injury?
   - PIP dislocation
   - Volar plate rupture
   - Splint dorsal aspect of the finger to allow Metacarpo-phalangeal (MCP) flexion and extension, but no phalangeal movement

Spleen Injury

During a junior varsity football game, one of your wide receivers is tackled from behind, landing on the football. He does not get up. When you get to him, he is alert, and is trying to catch his breath. He says he had the wind knocked out of him. His breathing has normalized from 20 breaths a minute to 15 breaths a minute and his anxiety levels have decreased. You walk him off the field.

8) When can this athlete return to play?
   - After a complete evaluation has been conducted and all his symptoms are gone
   - No shortness of breath or discomfort

9) Your evaluation produces no significant findings, except that his breathing is rapid and shallow. What is your next course of action?
   - Make sure he is sitting down
   - Remove his pads for comfort
   - Take his vitals

10) His blood pressure is 100/70 and his pulse is rapid and weak at 80bpm. His skin looks pale. What do you do to manage the situation?
   - Stay with him to monitor his symptoms
   - Keep him calm

11) A couple minutes later, he is complaining that he is nauseous and has pain in his left shoulder. What is your next course of action?
   - Re-evaluate the athlete
   - Perform evaluation to abdomen and thorax to rule out internal injury

12) His blood pressure is now 80/60 with rapid, weak respirations and pulse. His skin feels clammy. His upper left quadrant feels distended and his skin looks white as he vomits on the ground. What do you do to control the situation?
   - Contact his parents
   - Call 911 for transportation to the hospital

13) He says his mom is at the game. You do not know who she is, but he gives you her cell phone number. You call her and ask her to come down on the field. When she arrives, you explain her son's condition. She wants to take him to the hospital herself, instead of waiting for an ambulance. Do you let her take him? Why or why not?
   - After explaining the risks of self transportation to his mother, she is his guardian and ultimately it is her decision. You can advise her to let paramedics transport, but you cannot stop her from transporting her own son

if that is her choice. If the paramedics arrive before she insists on leaving, they can also talk to her and explain her options.

14) What pathology do you suspect?
- Potentially could be any number of internal injuries
- Vitals indicate internal bleeding
- Kehr's sign indicates a spleen injury.

In this case, he sustained a complete rupture of his spleen from landing on the ball when being tackled.

Sternum Fracture

During a summer women's basketball camp, while setting a screen, the opponent's shoulder drove into your athlete's sternum. She fell to the floor, displaying dypsnea.

5) When you get to her, what is your first course of action?
   - Perform a primary survey: airway, breathing, circulation

6) She is alert and reactive, but has trouble breathing. You initiate rhythmic breathing, and she calms down and appears better. Upon sitting up, her dypsnea returns with sharp pain in her chest. How do you manage the situation?
   - Lie her back down
   - Check her vitals
   - Evaluate the area

7) Her pulse is 80bpm with rapid, shallow breathing while her blood pressure is 120/70. She is panicked because she cannot catch her breath and breathing is painful. Her sternum is painful to touch. Her costal cartilage is tender to palpation, but not nearly as painful as her sternum. Her SC joints are not tender and are symmetrical. What is your next course of action?
   - Call 911
   - Leave her in a supine position
   - Re-initiate rhythmic breathing to help calm her down
   - Monitor her vitals

8) When she remains supine and calm with even breathing, her pain lessens and is manageable. Her pulse is steady at 75bpm with her blood pressure staying around 120/70. What possible injuries could she have?
   - Non-displaced sternum fracture
   - Sternal contusion
   - Costochondral injury
   - Cardiac contusion

This athlete was diagnosed with a sternum fracture and associated pericarditis.

Subdural Hematoma/Second Impact Syndrome

On Thursday, while you are preparing for your JV home football game, one of your athletes approaches you complaining of neck tightness.

8) How do you initiate your evaluation?
   - History: why is his neck tight?

9) He reports that Monday in practice he took a hit to his head by another helmet. He went home that night with a head-ache. The next day, he still had his head-ache, but his neck was sore too. When you ask him why he never told anybody, he said he thought it was no big deal. He then stayed home from school yesterday (Wednesday) because of the head-ache. Today his head-ache is gone, but his neck is tight. He wants you to work on his neck before he suits up. What is your course of action?
   - Tell him he is not playing today after not practicing the day before.
   - Advise him that due to his history and symptoms you will not allow him to return to practice on Monday unless he has a written letter of clearance from his physician.

10) When he returns on Monday, he has a letter of clearance from his physician. What is your next course of action?
   - Full head and neck evaluation to verify his current status and determine his baseline status

11) Today he is symptom free. He has no head-ache or neck pain. Cranial nerve testing is negative. He has full strength and ROM. You allow him to practice. He is fine through practice that day, Tuesday, and Wednesday. He plays in Thursday's game. During the 3rd quarter, he approaches you complaining of weakness in his legs, light headedness and inability to concentrate. It is 85 degrees outside, and he is wearing long black sleeves under his pads. What do you do to manage the situation?
   - Treat him for heat illness: move him behind the team to the benches, remove his pads and shirt, and cool him down with water.
   - His pulse is 70 bpm, his blood pressure 110/70.

12) How do you continue your evaluation?
   - History
   - Head evaluation

13) He does not remember any traumatic event on the field. His neurologic exam is normal. He is coherent without memory loss or balance problems. As his condition stays the same, what is your next course of action?

- Contact his parents to explain the situation and determine how they want to handle the situation.

14) You call his dad's cell phone, and he arrives. He decides he wants to transport his son to the hospital, but there is no need for an ambulance. He is stable, although something does not seem right about his condition. What conditions do you suspect?
    - Heat illness
    - Concussion
    - Second impact syndrome
    - Subdural hematoma

In this case, he lost consciousness on the way to the hospital, was diagnosed with a subdural hematoma and spent 5 days in the hospital.

Tension Pneumothorax

During a high school football game the quarterback released the ball, and while his arm was still in the air, was immediately hit in the ribs by a helmet. He got up from the ground and walked himself off the field. On the sidelines, he complained of not being able to catch his breath.

10) How do you initiate your evaluation?
    - Verify the mechanism of injury, chief complain, and location of his symptoms

11) What is your next step in evaluation?
    - Palpation

12) No rib deformity is felt, but he is TTP where he was hit. What is your next step?
    - Take vitals

13) His pulse is rapid and strong at 80 bpm. His blood pressure is 120/70. His skin is normal. His breathing is normal, but labored. He is not wheezing. His posture is guarded, but he can sit up straight and move his arms. What is your next step in evaluation?
    - Special tests

14) Rib compression is positive. What injury do you suspect?
    - Rib fracture

15) Is your evaluation over? If not, what would your next step be? What else might you suspect?
    - No: listen to his lung sounds to rule out pneumothorax or hemothorax

16) His lung sounds are absent in the right lower lobe. How does this information affect your suspected pathology?
    - Increases its severity to include a more serious condition, possible pneumothorax

17) What is your next step in evaluation?
    - Re-check his vitals to determine if there has been a change

18) There has been no change. He appears to be stable. How do you proceed?
    - Talk to his parents about your suspicions. Establish if they would like to transport him, since he appears stable, or see if they want you to call 911.

In this case, he suffered a tension pneumothorax, without a rib fracture

Suspected Thoracic Spine Injury

At the cycling velodrome during week-end competition, an individual rider starts for his 1 kilometer race. He stands out of the saddle, accelerating as fast as he can, when you see him lose his cadence and fall forward onto the handlebars of the bike. You know he will crash, as "track bikes" have no brakes, a fixed gear and cannot free wheel. You expect him to fall to the right and slide down the track, as all crashes do. However, he flips over to the left onto the asphalt, landing on the left side of his body. He immediately starts screaming.

2) Did he fall in a relatively good or bad manner and why? Is there anything about the velodrome or equipment that you, as an athletic trainer, need to know or understand that could contribute to the severity of injuries sustained while on the velodrome?
   - Bad
   - Velodromes are banked to the right, so when you fall to the right, you do not fall far before your right hip contacts the ground and you slide down the track.
   - Falling to the left means that you fall farther, land on hard asphalt, and "stick" to the asphalt instead of sliding to a stop

3) What is your first course of action?
   - Get to him and instruct him not to move

13) When you get to him, he is lying on his stomach with his left arm underneath his chest. He is moaning in pain. You instruct him not to move and he argues because his position is uncomfortable. How do you handle the situation?
   - Explain to him that you need to verify the extent of his injuries before you can move him
   - Instruct him to remain calm and to breath steady

14) What possible injuries do you suspect at this time?
   - Head injuries
   - Spinal injuries
   - Heart contusion
   - Rib fracture
   - Costochondral separations
   - Internal Bleeding
   - Fractured Clavicle
   - Fractured Humerus, radius, or ulna
   - Fractured sternum
   - SC separation

15) With all the injuries listed in #3 in mind, how do you initiate your evaluation?

- Rule out spinal injuries first
- Perform sensory and motor testing
- Palpate the spine
- Observe his helmet for signs of contact

16) His helmet is off his head, with the left rear side broken into pieces. He can squeeze your hands and wiggle his feet. He has full sensation in his arms and legs. For each spinal level tested, where would you palpate him for sensory testing?
    - C5 – deltoid
    - C6 – radial forearm and thumb
    - C7 – middle finger
    - C8 – ulnar forearm and little finger
    - T1 – medial elbow
    - L1 – gluteus masimus
    - L2 – proximal anterior thigh
    - L3 – knee and medial quad
    - L4 – medial crucus and hallux
    - L5 – tibialis anterior and middle toes
    - S1 – distal peroneals and little toe

17) He continues to complain about pain in his chest and he wants to move. Do you move him yet and why or why not?
    - No
    - Need to perform palpations to the spinal column

18) During palpation of his spinous processes, he screams in pain when you touch around T7. What is your next course of action?
    - Call 911 for transport

19) He complains that he is having trouble breathing. Do you allow him to move and why?
    - No
    - He may have a thoracic vertebral injury and moving him might worsen his injury
    - He needs to remain calm, concentrate on even breathing and imagine himself somewhere else.

20) Going back to his broken helmet, is their any course of action you take regarding a possible head injury while you await the paramedics?
    - Inquire how the helmet got removed
    - Cannot perform full head evaluation due to his present condition and position

- Keep him calm and talking

21) He says he removed his helmet as soon as he was on the ground because he "did not need it anymore". While you wait for the paramedics, is their any other information you should gather?
    - History: inquire what happened

22) He indicates that while he was accelerating out of the saddle, his chain came off during a powerful down-stroke of his left foot. That caused his momentum to fall forward, where the left side of his chest hit the aerobar pad on his handlebars. He then fell to the left, landing on left shoulder/upper back. What possible injuries do you suspect?
    - Thoracic vertebral injury
    - Cardiac contusion
    - Costochondral separation
    - Possible concussion

This athlete suffered from a cardiac contusion, costochondral sprain of ribs 1-3, massive soft tissue injury to his left upper quadrant, and road rash. He spent the night in the hospital to be monitored for a heart attack.

Throat Contusion

During a baseball game, an infield grounder took a bad hop, came up and hit the second baseman in the throat. He is sitting on the ground when you get to him.

10) What are the initial life threatening injuries you think he might have as you run out onto the field?
    - Fractured or dislocated thyroid or cricoid cartilage
    - Collapsed or crushed larynx
    - Airway obstruction

11) What is your first course of action?
    - Perform a primary survey: ABC's

12) He is breathing, but displays dyspnia, wheezing, and a hoarse voice when he tries to talk. What other symptoms do you need to observe and evaluate? Why are these symptoms important?
    - Ability to swallow: discomfort is expected with this injury, but severe pain may indicate a more serious injury
    - Quality of carotid pulse: forces to the throat can injure the carotid artery, resulting in a blood clot and decreased blood flow to the brain

13) Swallowing is uncomfortable, but with effort he is able to swallow. His carotid pulse is found and is rapid but steady. What is your next evaluative step?
    - Perform a secondary survey: observation, palpation

14) His throat is red and a hematoma is becoming evident over his thyroid and cricoid cartilage. He is TTP over both the thyroid and cricoid cartilage. Why are those structures important?
    - They protect and cover the larynx

15) The athlete is beginning to become agitated as he tries to take deep breaths. What do you tell him?
    - He needs to take slow breaths in a comfortable range; in through the nose out through the mouth. Do not force taking deep breaths, they are more painful.

16) His breathing is more controlled, and he is calmer now. How do you continue your evaluation?
    - Evaluate for a head injury

17) Head evaluation does not reveal any significant findings. What is your last evaluative step?

- The inside of the mouth should be inspected looking for any blood, which could indicate an injury to the inside of the throat.

18) Due to the conditions listed in #2, how should this condition be managed?
    - Removal from the game for observation
    - Head injury re-evaluation in 20 minutes to verify the absence of a concussion
    - If a head injury is present, physician referral to rule out carotid artery involvement
    - If symptoms worsen, physician referral
    - Ice the throat to decrease pain, spasm, and inflammation

Tibial Plateau Fracture

During a high school football game, at the end of a play, a lineman is identified as remaining on the ground after being hit, however you did not see the incident.

11) What is your first course of action?
    - Go out onto the field
    - Begin your primary survey

12) When you get to him, he is lying in the fetal position, holding his right leg in his hands, complaining of intense knee pain. How do you initiate your evaluation?
    - History: what happened during the play?

13) He does not remember anything other than being hit, and feeling immediate pain in his knee. What is your next step in evaluation?
    - Observation
    - Need to consider if he can be moved right away or not

14) He does not want to change position or move his leg. When you try to pull his pants above his knee, he is in too much pain for you to accomplish your task. What do you do to manage the situation?
    - Cut his pants to reveal the knee

15) Once you get the area exposed, you see how much he has already swelled. The swelling was immediate, and is located below the tibial flare. It is very hot to touch. What is your next course of action? Should this athlete be removed from the field at this point?
    - No: need to determine the type of injury and the stability of the leg first.

16) He is point tender over the tibial plateau. No defects are felt in the tibia or femur. What are your next steps in evaluation?
    - ROM
    - Special tests

17) He is unwilling to move his leg due to pain. You are able to passively move his leg to perform special tests which reveal a positive Lachman's. What pathology do you suspect? Are there any special considerations that would indicate one pathology over another?
    - Tibial Plateau fracture
    - ACL rupture
    - In adolescents, ligaments may be stronger than the bone and the growth plate. Due to this athlete's age, severity of pain, and location of swelling, a break

through the growth plate needs to be considered, with management erring on the side of being too conservative.

18) If your suspicions are correct, how do you explain the results of your special tests?
    - With a break of the tibia through the growth plate, part of the tibial plateau has completely broken away. If that segment of bone includes the attachments of the ACL and PCL, with stress testing, even though the ligament is intact, a positive result will be found as the tibial plateau is being pulled away from the tibia.

19) How do you manage the situation?
    - If the athlete stays stable, splint the area with a Sam or Vacuum splint and release him to his parents for them to transport to the hospital.
    - If he is unstable, or if his parents are unwilling to transport or are not present, call 911 for ambulance transport to the hospital.

Traumatic Javelin Injury

While attending track and field nationals, you sit with the javelin throwers awaiting their round of competition. You hear someone yell "heads-up" as you see a javelin "catcher" look up from where he is standing in the javelin sector. He is wearing a floppy straw hat, so he does not see that the javelin is heading directly towards him. You watch as the javelin penetrates his face.

2) What is your first course of action?
   - Run out to him to assess the situation
   - Yell to somebody to call 911 and access the emergency access plan

9) Almost immediately after being hit, you watch him reach up and pull the javelin from his face as he falls to the ground. What do you do when you reach him?
   - Assess his LOC
   - Tell him to remain calm

10) He is conscious and appears stunned. A student athletic trainer approaches you and asks you what she should do. What do you tell her?
   - You need gloves and lots of gauze
   - Tell her to verify that the emergency access plan has been activated with the paramedics on the way

11) What is your next course of action?
   - Assess the damage to your patient
   - Locate where the javelin penetrated
   - Locate the areas of bleeding
   - Verify that the patient can breath

12) The javelin penetrated between the bridge of his nose and the medial aspect of his orbit. He can breathe, but he has blood in his mouth that he wants to spit out. What might that implicate?
   - Injury to the inside of his mouth as well

13) How do you assess your suspicions?
   - Observation of the inside of his mouth

14) Observation reveals a penetration hole in his soft palate approximately the size of a quarter. How do you manage this situation?
   - Position him on his side so that blood does not run down his throat
   - Apply direct pressure with gauze to his palate as well as his facial wound
   - Await paramedics
   - Direct available people for crowd control

- Monitor him for shock

15) What is the most important thing for you to remember in situations such as these?
    - Remain calm
    - If you remain calm you have a better chance of calming the athlete or patient than if you are frantic. If the athlete or patient will not remain calm, the situation will spiral out of control.

Ulnar Dislocation

During wrestling practice challenge matches, two wrestlers are on the mat, struggling for the advantage over their opponent. One wrestler posts on his right arm and gets chopped by his opponent to the front of his elbow, just below the joint line. He collapses to the ground and is yelling for the match to stop. As the commotion in the room dies down, he sits up holding his right forearm in his hand. His arm is obviously deformed.

7) What is your first course of action?
   - Approach the athlete to assess his arm

8) He arm is held in flexion. His forearm appears shortened, and he looks like he has acquired olecranon bursitis. What pathology(s) do you suspect?
   - Ulnar dislocation
   - Olecranon bursitis

9) What is your next step in evaluation?
   - Palpation to assess the location of the deformity

10) Palpation indicates that his humerus appears to be displaced anteriorly to his olecranon. Palpation of the olecranon reveals too much of the olecranon process is palpable. What is your next course of action?
   - Check for a distal pulse, capillary refill and neural insufficiency/compromise

11) His radial pulse is 120 bpm and is strong. Capillary refill is good. Has your suspected pathology changed?
   - No

12) How do you manage this condition?
   - Splint the arm in its current position, leaving accessibility to the distal pulse
   - MD referral for x-rays and reduction

EVALUATIONS AND REHABILITATION

THE FOOT

Interdigital Neuroma

A men's soccer player enters the athletic training room one day before practice complaining of a sharp pain in his foot. The athlete states his first step out of bed in the morning causes an electric stabbing pain in the ball of his foot. He also gets the same pain during soccer practice. He takes his shoes off immediately after practice to relieve his pain. You notice the soccer boots he brought into the training room look new. The athlete confirms he is breaking in new boots.

6) How do you start your evaluation?
   - Observation
   - ROM
   - MMT

7) What pathology do you suspect based on the subjective information?
   - Interdigital Neuroma

8) Observation of the athlete's foot does not reveal anything remarkable compared to the contra-lateral side. ROM is normal and MMT indicates full strength. Walking barefoot does not produce pain. What is your next step in evaluation?
   - Have the athlete walk in his boots to replicate symptoms.

9) There is pain with walking when wearing his boots. Are there any other items you would want to evaluate?
   - Metatarsal mobility
   - Rigidity of the boot
   - Gait and foot mechanics
   - Ask the athlete if he has pain with any other shoes

10) His metatarsal mobility is limited. Pencil eraser test and Metatarsal Rolling Grind test are both positive. What do you suspect is this athlete's pathology, and what do you suspect is the cause?
   - Interdigital Neuroma
   - Tight foot intrinsics
   - Tight new shoes

Metatarsal Stress Fracture

During a rain delay at a tennis match, one of your athletes approaches you, complaining of pain in her foot. She first noticed it during a long point during her match. It has not gone away. She complains of pain around the outside of her foot.

8) Is there any other information you need to complete the history aspect of your evaluation?
   - Any previous foot injuries
   - Type of pain
   - What makes it worse or better

9) She indicates that she has not injured her foot before, however she has "abnormally wide feet" and has to buy men's tennis shoes to accommodate her feet. The pain is a constant ache, which worsens when she stands on it. Getting off her feet helps to alleviate her discomfort, although she can still feel it. Do you continue your evaluation during this rain delay, or do you wait until the completion of the match? If you continue, what is your next step in evaluation?
   - Ask the athlete: if she wants take advantage of the rain delay, perform your evaluation. If it would be too distracting for her, continue after the match.
   - Continue with observation, palpation and ROM

10) Observation reveals wide feet, particularly through the mid and forefoot. Palpation indicates increased tone in her right abductor digiti minimi, compared to the left foot. Although she complains of diffuse pain over the whole lateral aspect of her foot, she has no other palpable pain. ROM is full, without pain. Are there any special tests to perform on this athlete? If so, what?
   - Percussion to lateral metatarsals
   - Long Bone Compression test
   - Midfoot stressing

11) All special tests are negative. What pathology do you suspect based on your findings? Do you allow this athlete to continue in the match? If so, are there any steps you can take to immediately that would help her?
   - Compression and over-use of the abductor digiti minimi
   - If she is able to continue, there is no point in with-holding her come competition
   - Depending on how much time they have left to play, she can take drugs for pain relief or inflammation
   - Best not to try any tape on this athlete. The abductor digiti minimi is already irritated, so tape constriction would only make it worse.

12) Through-out the next week, she goes to the ATR for heat and stretching before practice, and ice after practice. At the end of the week, she enters the ATR complaining of worsening pain in her foot. She walks with an antalgic gait, trying to minimize time spent on her right foot. She says during practice, she pivoted to get a ball, and felt immediate pain in her foot. The pain has not abated. How do you initiate your re-evaluation?
    - Observation
    - Palpation
    - ROM

13) Observation reveals nothing different than before. Palpation reveals the spasm of the abductor digiti minimi is reduced from before, but still increased compared to the contra-lateral side. She is now TTP along the shaft of her fourth MT, especially on the proximal aspect, around the metatarsocuboid joint. She only has pain with palpation, or when she stands on her foot. However, her palpation pain is worse than standing pain. ROM is still full, without pain. Are there any special tests you would perform on this athlete? If so, what?
    - Percussion
    - Tuning Fork
    - Midfoot stressing

14) All special tests produce moderate discomfort. What pathology do you suspect? What is your next course of action?
    - Stress fracture
    - Sprain/instability of the fourth metatarsocuboid joint
    - Non-weight bearing on crutches
    - Physician referral for x-rays and evaluation

Metatarsalphalangeal Joint Instability

A women's soccer forward approaches you after a game, complaining of pain in her foot. She says she does not know if she is just sore since she just played most of the game, or if she hurt her big toe. Unfortunately, she has to go to work and does not have the time for you to look at her immediately. She asks what she should do for herself.

2) What do you tell her?
   - Ice if she can now for 15 minutes and again after work for 15 minutes
   - Come in to see you tomorrow before practice

2) She comes into the athletic training room before practice the next day and reports that she iced her foot last night, which made it feel better. She feels okay today. What is your next course of action?
   - Initiate your evaluation of her foot, starting with her history

3) She reports her foot has been bothering her during practice for a little while now. She does not remember how long, but she has always been able to play through it. Yesterday was the first time she felt it during a game. The pain is in her big toe. What other information do you need to know about her pain?
   - When in her stance does it hurt her?
   - What kind of pain is it?
   - Does she feel it any other time?
   - Shoes: new, old, tight?
   - Any changes in her training routine?

5) It hurts her when she pushes off of that foot. The pain is sharp, but she only feels it when she is playing soccer or running. She has had her boots for a few months, and they are broken in well and are comfortable. There have been no changes in her training routine. Before continuing your evaluation, what injuries do you suspect?
   - Turf toe
   - Sesamoiditis
   - Hallux valgus
   - Neuroma

5) How do you continue your evaluation?
   - Observation
   - Palpation
   - ROM
   - Strength testing

6) Observation reveals nothing significant. She is not swollen nor does she have any boney prominences that may cause irritation. She has full ROM and strength in her foot and first MTP joint, but reports pain in her first MTP with hyperextension. You cannot find any palpable pain. Is your evaluation complete?
   - No: should perform ligamentous tests to check the integrity of the joint

7) Varus and valgus tests are negative. There is pain with hyperextension. What pathology you suspect?
   - Turf toe
   - Sesamoiditis

9) How do you manage the situation? Is this athlete able to participate?
   - Yes, with turf toe taping to avoid hyperextension of the great toe, as long as she can be effective

9) After practicing with her first MTP fixated, she reports that she had more pain. Is that to be expected? What do you do?
   - No, it is not expected
   - Re-evaluate her to verify that your conclusions were correct

20) During your re-evaluation of her foot, what should you be sure to focus on?
   - Foot biomechanics
   - Gait pattern abnormalities

11) Her non-weight bearing posture looks normal, however, when she is standing in full weight bearing, her second ray looks medially deviated. She still reports pain in the same spot when walking. What special tests should you perform?
   - Stress tests to the 2^{nd} MTP

12) Stress testing produces pain, with grade 3 laxity of the MTP on the dorsal and plantar aspects. Now, what pathology do you suspect?
   - Instability of the 2^{nd} MTP

Midfoot sprain

A women's soccer player limps off the field with a toe gait, complaining of pain in her foot.

2) How do you initiate your evaluation?
   - History: what happened, where does it hurt?

2) She was planted when she twisted and felt a "pop". Her pain is around the middle of her foot and the front of her ankle. What is your next step in evaluation?
   - Observation

3) She presents with mild swelling around the anterior ankle. There is no discoloration. How do you continue your evaluation?
   - Palpation

8) She is point tender over the cuneiforms. Palpation of the medial aspect of the navicular increases her pain in the mid-foot. What is your next step in evaluation?
   - ROM
   - Strength testing

9) All AROM is WNL, with pain. RROM is 4/5 due to pain with dorsiflexion and eversion. She is unable to bear weight. What is your next step in evaluation?
   - Stress testing

5) Stressing her metatarsals causes pain. What pathology do you suspect?
   - Midfoot sprain

6) What is your next course of action?
   - Use of crutches
   - Refer for x-rays to rule out fracture

Navicular Stress Fracture

A men's basketball player enters the athletic training room complaining of foot pain.

1) How do you initiate your evaluation?
   - History
   - Observation

3) He reports no pain during the day; his pain starts with basketball practice and continues for a few hours afterwards. He has never had foot pain before, but this has been hurting for a couple weeks. Upon observation, you consider your significant findings to be his ectomorph frame and pes cavus feet with rigid arches and claw toes. What is the next step of your evaluation?
   - Palpation

4) His pain is dorsal near the subtalar joint. What are your next steps in evaluation?
   - ROM
   - Strength testing

4) He presents with decreased flexibility of his plantar flexors, and posterior tibialis weakness. How do you continue your evaluation?
   - Special tests of the ankle mortis and foot

5) Special tests reveal negative subtalar laxity, talar dome stress, and navicular compression or percussion. The positive findings indicate midfoot hypomobility and forefoot hypermobility. Dorsal pain is elicited with forced inversion with dorsiflexion. Why is that finding significant?
   - Compresses the navicular

6) What pathology do you suspect? Why?
   - Navicular stress fracture
   - Common in basketball players who present with pes cavus

13) What is your next step in evaluation?
   - Refer to physician for evaluation and x-rays

Plantar Fasciitis

A cross country runner enters the athletic training room before practice complaining of foot pain. She has been managing the situation on her own, but her pain is now worse.

2) Is the information given sufficient for the history portion of the evaluation? If not, what other information is necessary?
   - No
   - How long has it been hurting?
   - What makes it hurt?
   - What has she been doing for it to "manage the situation"?
   - Does she wear orthodics or shoe inserts?

2) She began running 3 weeks ago, after a knee injury. She wears orthodics, but has also been wearing heel cups for chronic heel pain. Her foot hurts to walk, at the end of the day and when she gets out of bed in the morning. She has been icing and massaging her heel on her own, but last night her pain was worse after her massage. What is your next step in your evaluation? What pathology do you currently suspect?
   - Observe gait and foot biomechanics
   - Plantar fasciitis

3) She walks on the lateral aspect of her foot. She says this is due to her pain levels. Foot posture indicates pes planus, which is corrected when tested on her orthodics. What is the next step in your evaluation?
   - Palpation
   - ROM

5) She has moderate discomfort with medium pressure over the arch. She is point tender at the medial calcaneal tuberacle, but has no pain over other aspects of her calcaneous. What pathology do you suspect?
   - Plantar Fasciitis

5) Passive dorsiflexion is limited at the end ranges, as is toe hyper-extension. All other ranges are normal. What might limited dorsiflexion indicate, and how is that important to your evaluation?
   - Tightness of the Triceps Surae
   - Often accompanies plantar fasciitis

Plantar Wart

A tennis player complains of a thick spot on the bottom of his foot. Observation reveals a focal site of thickened tissue with little brown dots proximal to the metatarsal heads. Direct pressure to the spot does not produce any symptoms, but pinching the area does produce pain.

5) What pathology do you suspect?
   - Plantar wart

6) How is the condition you have evaluated commonly treated?
   - MD referral for wart removal
   - Removal techniques: freeze with liquid nitrogen, electrodesiccation

7) If not treated, what will happen?
   - The wart will continue to grow from deep to proximal, creating pain and possible inability to participate.

8) After treatment can the athlete return immediately to participation? If not, then when?
   - At the discretion of the physician. Restricted time will be based on the size of the growth removed and the removal technique.

Sesamoiditis

You observe a cross-country runner entering the athletic training room with a calcaneal gait.

9) What is a calcaneal gait?
   - Walking predominately on the calcaneus with the foot in dorsiflexion

10) He explains that he has a sharp pain in the ball of his foot when he walks or runs. How do you initiate your evaluation?
   - History

11) He has been increasing his mileage. He is now running in both the morning and the evening to meet his training goals. You decide to conduct the observation portion of your examination. At this point, what will most likely be the most revealing aspect of your evaluation?
   - His shoes

12) Observation of his foot does not reveal any significant findings, however, his shoes are old with the tread worn. What steps do you take next in evaluation, and what pathologies do you suspect?
   - Palpation
   - ROM
   - Stress fracture, sesamoiditis, neuroma

13) Palpation of the first MCP joint produces pain. ROM and strength are full. What is the differential diagnosis for the suspected condition?
   - Capsular stress tests and sesamoid palpation

14) MCP stress tests are negative. How do you isolate the sesamoids?
   - For the medial sesamoid, press laterally
   - For the lateral sesamoid, press medially

15) Sesamoid palpation reproduces his pain symptoms. What pathology do you suspect?
   - Sesmoiditis

16) How do you treat or manage this condition?
   - Buy new shoes
   - Metatarsal cookie (pad the area)
   - Cut mileage back by a minimum of 20% to minimize irritation while still maintaining fitness until symptoms subside
   - Cross-training

- Anti-inflammatory ultrasound
- Ice post activity

Talus Fracture

During a track meet, a triple jumper hit the board off her right leg, and collapsed into the pit. She complains of immediate, unrelenting pain over the front of her ankle.

5) How do you initiate your evaluation on the field?
   - History
   - Inspection
   - Palpation

6) The athlete reports a previous ankle sprain, which felt "nothing" like her pain now. Inspection reveals no deformities or swelling. The athlete is only TTP over the talar dome. How do you continue your evaluation?
   - ROM
   - Special tests

7) All plantar flexion (passive, active, resisted) is normal. Passive dorsiflexion is asymptomatic, but the athlete is unable to actively dorsiflex her foot. Bump test produces pain over the talar dome. What pathology do you suspect?
   - Talar dome fracture or compression of the hyaline cartilage

8) How do you manage this situation?
   - Immobilization
   - Referral to a physician for x-rays and evaluation

This athlete suffered a compression fracture to her talar dome.

THE ANKLE AND LOWER LEG

Achilles Tendon Rupture

During warm ups for an away football game on artificial turf, an athlete walks off the field with a slight limp and comes towards you complaining of pain in his calf. He says he was back peddling, planted and pushed off to go forward. As he came up on his toes he felt a "pop" in his calf.

10) What injuries do you suspect?
    - Calf strain
    - Achilles tendon rupture

11) How do you initiate your evaluation?
    - Observation
    - Palpation

12) Observation reveals an antalgic gait, with no other significant findings. Palpation reveals point tenderness around the distal calf. What is your next step in evaluation?
    - ROM
    - Strength testing

13) ROM is full, however strength is decreased. Athlete reports pain with active plantarflexion and passive dorsiflexion. What is your next step in evaluation?
    - Special tests

14) Thompson's test is negative. What is your next course of action?
    - Ice for 20 minutes for analgesia and vasoconstriction

15) After icing, observation reveals a mass proximal to the calcaneus. What injury do you suspect?
    - Achilles rupture

16) How do you confirm your suspicions?
    - Use Thompson's test again

17) No movement is noted. What does that indicate?
    - Achilles tendon rupture

18) If the Achilles is ruptured, how do you explain the (-) Thompson's prior to icing, but a (+) Thompson's after icing?
    - Active plantarflexion can be achieved through contraction of the peroneus longus and brevis, flexor hallucis longus, flexor digitorum longus, plantaris, and tibialis posterior muscles, even though contraction strength is decreased.

Lateral Ankle Sprain

The first day after winter break, while you are watching basketball practice, a post player running towards the basket collapses on the floor. She is lying on her side with her right lower leg in her hands, crying. You approach her and calm her down.

2) What are the first questions you would ask her?
   - What happened?
   - Where do you hurt?

12) She reports that she was running, went to cut to the left and rolled her right ankle. She never made contact with any other player. What other question would be relevant to your evaluation?
   - Has she previously sprained this ankle?

13) Yes, she has. The coach is badgering you about moving her so that she can continue practice. How do you handle the situation?
   - Calmly explain to the coach that there are a few things you need to evaluate prior to moving the athlete, but you will have her off the court as soon as possible.

14) While she is still on the court, is there any other information you need to obtain prior to moving the athlete?
   - Yes: determine if there is a fracture and the stability of the athlete's condition before moving her.

15) She is able to move her knee and her toes. Are there any special tests to perform on the court prior to moving this athlete?
   - Bump test
   - Squeeze test
   - Percussion test

16) Bump, Squeeze and Percussion tests are negative. What is your next course of action?
   - Stand her up and see if she is able to bear weight. If she is able, she can walk off the court. If not, you can assist her or retrieve crutches.

17) She decides to hop off the court; but she is able to bear weight, although it is painful. Once off the court, how do you continue your evaluation?
   - Remove her shoe for observation and palpation

18) She has a pocket of swelling superior to the lateral malleolus. Palpation reveals tenderness over the tibiofibular syndesmosis, ATF ligament and CF ligaments. What are your next steps in evaluation?
    - ROM
    - Special tests

19) She has full plantar and dorsiflexion, although end-ranges are painful. She has restricted range in inversion and eversion due to pain. Special tests indicate a positive Anterior Drawer, Inversion and Talar Tilt. Kleiger's is negative. What pathology do you suspect?
    - Lateral ankle sprain

20) What severity do you suspect and why?
    - 2^{nd} degree
    - Pain over both the ATF and CF indicate a 2^{nd} degree injury

21) What is your immediate management of the situation?
    - Compression
    - Ice
    - Elevation
    - Compression sock
    - Air cast
    - Crutches

Medial Tibial Stress Syndrome

A cross-country runner enters the athletic training room 4 weeks into the season, complaining of "shin" pain. She indicates that she always had "shin splints" in high school, and now that she is in college, with access to an athletic trainer, she thought maybe you could help her.

14) How do you initiate your evaluation?
    - History of: lower leg injuries, current pain and location, current training habits, current self-management

15) She ran throughout high school, and always had shin splints. She would ice them on her own, but that was all. She bought new shoes more frequently than anybody else on her team because newer shoes helped a little to alleviate her pain. Her pain is a constant ache, but becomes sharp when she runs, especially when she is out on the road. The pain is on the inside of her shin. She is currently training with the team and they are running twice a day for a total of about 40 miles a week. She tries to ice her shins after practice, but in the mornings it is hard because she goes to class after practice. What is your next step in evaluation?
    - Observation of: lower leg, posture, gait, and foot biomechanics and posture

16) Observation of her lower leg reveals some puffiness along the mid-shaft of the tibia. Why is it essential with lower leg chronic injuries to assess foot biomechanics and posture as well as body posture and gait?
    - The body functions together as a whole. Chronic injuries usually indicate a biomechanical origin. Pain along the medial tibia may be a sign of a lower cross system dysfunction which is characterized by: pes planus, internal rotation of the tibia, genu valgum, internal rotation of the femur, and an anterior tilt of the pelvis. Unless the cause of the dysfunction is corrected, she will always have shin pain.

17) Observation of her foot posture and biomechanics reveals pes planus, and rearfoot valgus. Her standing posture reveals an anteriorly rotated pelvis and genu valgum. What do you suspect is the cause of her pain?
    - Lower cross system dysfunction

18) What is your next step in evaluation?
    - Palpation

19) Palpation of the medial tibia is painful and continues to be painful with palpation posterior to the medial malleolus and into the medial longitudinal arch. Nodules are noted along the tibia. Are there any other areas to be palpated? If so, where? Why?

- Yes
- Check for tightness in: peroneals, lateral gastrocnemius, ITB, Psoas
- With a lower cross system dysfunction, all areas of the legs are affected, either by being tight or weak. The above listed areas would have an increased likelihood of increased tightness.

20) What are your next steps in evaluation?
    - ROM
    - Strength testing

21) ROM is full in all areas. Strength testing produces pain with inversion. Weakness is noted with inversion and dorsiflexion. Are there any other areas strength testing should be performed? If so, where? Why?
    - VMO, quads, piriformis, and gluteus medius
    - With a lower cross system dysfunction, these areas may be weakened

22) She is weak in all areas listed. What pathology do you suspect?
    - Lower Cross System creating MTSS
    - TIbial stress fracture
    - Soleus strain

23) How is this condition corrected?
    - Possible need for orthodics
    - Core strengthening

24) Are there any general health conditions you would like to assess for this athlete, why?
    - Nutrition
    - Weight
    - Possible eating disorder

25) What is your next course of action?
    - MD referral for evaluation, x-rays and orthodic evaluation

26) How will you treat this condition?
    - Reduce running mileage
    - Alternative cardiovascular training on the bike, stair-stepper, and pool
    - Heat to the lower leg pre-activity
    - Ice post
    - Strengthening to the lower leg and foot intrinsics
    - US to the medial tibial border
    - STM to the medial musculature

- Stretching of tight muscle groups
- Core strengthening
- Possible nutrition counseling

Syndesmotic Ankle Sprain

During a high school football game, a receiver catches the ball, plants his left leg, and takes a hit to his hip. He is hit from the left side, causing him to rotate to the right, while his left leg remains planted. After being tackled to the ground, he is slow to stand. A teammate holds out a hand and pulls him up, but after taking a step on that foot, he doubles over back onto the field.

8) How do you handle this situation?
   - Go out on the field
   - Perform your primary evaluation
   - Rule out fracture
   - Remove the athlete to the sidelines

9) Back on the sidelines, the athlete reports pain in his ankle that worsens when he tries to stand on it. How do you continue your secondary survey?
   - Remove both shoes and socks for observation and bilateral comparison

10) No swelling or deformity is visible. What is your next step in evaluation?
   - Palpation

11) Palpation is only painful over the distal syndesmosis. How do you continue your evaluation?
   - ROM
   - Strength testing

12) Active plantar and dorsiflexion ROM and strength are limited due to pain, especially plantarflexion, while inversion and eversion ROM and strength are full and asymptomatic. How do you continue your evaluation?
   - Special tests

13) Bump and squeeze tests are painful at the distal tibiofibular joint. Anterior Drawer is positive for pain, also at the distal tibiofibular joint. Inversion is negative. Talar Dome Stress is positive for pain, not at the talar dome, but again at the distal tibiofibular joint; and any kind of talar rotation while in neutral causes him immense pain. Kleiger's is positive. What injury do you suspect? Why?
   - Syndesmotic ankle sprain
   - Due to the mechanism of injury and the presence of symptoms at the distal tibiofibular joint instead of the lateral ankle

14) Are there any other injuries you need to rule out? If so, what are they and how do you rule them out?
   - Talar dome injury

- Fibular fracture
- Physician referral and x-rays

Tibialis Anterior Tendonitis

A cross-country runner enters the athletic training room complaining of fatigue in her lower leg. Her "shin" has been feeling tight and tired.

9) How do you initiate your evaluation?
   - History

10) She has never experienced "shin" pain before. Her pain is constant, like an ache; but when she runs the pain becomes sharp. She has been running a lot of hills lately. She bought new shoes a few weeks ago. Her biggest complaint is fatigue in the front of her leg and down onto her foot. What is your next step in evaluation?
   - Observation

11) Observation produces no significant findings. How do you continue your evaluation?
   - Palpation

12) Palpation of the tibia is not painful. However, palpation over the tibialis anterior is tender and increased tone is noted. Crepitus is noted as the tendon crosses the front of the ankle onto the dorsum of the foot. What type of pathology do you suspect?
   - Muscle strain
   - Tendonitis

13) With the pathology listed in #4, what is the differential diagnosis?
   - Pain with active contraction and passive stretch the opposite direction

14) AROM and PROM are limited in plantarflexion, due to both tightness and pain. Passive dorsiflexion is full, but actively pain is felt. Resisted eversion elicits some symptoms, as does passive inversion. What pathology do you suspect based on your findings?
   - Tibialis Anterior strain
   - Tibialis Anterior tendonitis

15) What should be the main therapy goal for this pathology? How will you accomplish this goal?
   - Decrease inflammation in the tendon and muscle belly
   - Alter her training regimen
   - Heat, us, stretching, strengthening

16) Should this athlete alter her training regimen? How?

- Yes
- Minimizing pounding activities, i.e. alternative bike, pool, stair-stepper work-outs for cardio

Tibialis Posterior Over-use

During the pre-season, a women's basketball player enters the athletic training room complaining of pain in her "shin", pointing to her tibia.

9) How do you initiate your evaluation?
   - History – what activities has she been doing? What makes her leg hurt? How long has it been hurting? Where does it hurt? Describe the pain.

10) She reports that she first felt pain in her shin last week when the team was conditioning. She was running bleachers when she first felt pain "behind her ankle gone". After bleachers they ran sprints, when she felt a sharp pain in her arch. She has never had foot problems before. What is your next step in evaluation?
   - Observation of posture and biomechanics of her foot and leg, and her shoes

11) She has no visual deformity in her leg. However, her shoes are worn and need to be replaced. Her foot posture reveals pes cavus with pronation. What is your next step in evaluation?
   - Palpation

12) She is point tender along the distal, medial tibia, continuing posterior to the medial malleolus inferiorly into the arch. However, the arch itself is not tender. How do you continue your evaluation?
   - Ankle and foot ROM
   - Strength testing

13) She is 5/5 in AROM of both the foot and ankle. Resisted inversion is 4/5, with pain. However, passive eversion produces more pain. Hallux ROM is full, 5/5 on strength and produces no pain. What pathology do you suspect?
   - Tibialis Posterior Over-use

14) Are there any other steps necessary in your evaluation? If so, what are they?
   - Special tests
   - Stress test the spring ligament to rule out arch pathology as cause of arch pain

15) Is this condition at all related to participating in worn shoes? If so, how?
   - Yes
   - When shoes break down, they lose their shock absorbing ability and their support to the arch. The foot is allowed to pronate more with every step, thus increasing stress on the tibialis posterior which helps to maintain the arch.

16) Will the purchase of new shoes help manage this condition?

- Yes
- The foot and body will be supported, taking pressure off the tibialis posterior.

THE KNEE

Iliotibial Band Syndrome

(This scenario may require unconventional thinking.)

A women's basketball player enters the athletic training room after returning from winter break complaining of right leg pain. Her hip aches all the time and her knee hurts when she plays. She reports running over break for conditioning. She has been having knee pain for a few weeks, with the severity increasing recently. Her hip has been painful for about 1 week.

2) How do you begin your evaluation and what structures do you suspect?
   - Low back evaluation
     - Lumbar spine ROM and MMT
     - Long-sit test, Faber test, Sacroiliac joint fixation test
   - ITB Syndrome with possible associated pelvic dysfunction

7) Your evaluation determines that ROM is full without pain and strength is full. Long-sit test indicates that the right leg appears longer than the left. With Faber's test, the right leg lacks abduction compared to the left side and the Sacroiliac Joint Fixation test indicates the right SI is higher than the left. What are your thoughts regarding the athlete's condition and what is your next step in evaluation?
   - Evaluate hip ROM and MMT because this is most likely an injury due to a biomechanical problem

8) Hip ROM is full and strength is good, but abduction is 4/5 with MMT. Palpation reveals tenderness on the lateral aspect of the hip, distal to the iliac crest. All hip special tests are negative. What do you do next in your evaluation?
   - Move down the kinetic chain to evaluate the knee

9) Your knee evaluation reveals full ROM and strength. The lateral aspect appears "thicker" than the contra-lateral leg. The athlete is tender to palpation over Gerdy's Tubercle and distal ITB. Varus and Valgus stress tests are negative at 0 and 30 degrees. Meniscal tests are negative. Lachman's and Posterior drawer tests are also negative. With Ober's test, the right leg does not adduct, but stays abducted with a springy feel to it when forced into adduction. Pain is felt. What is your assessment of this athlete?
   - ITB inflammation possibly due to an anteriorly rotated right ilium

10) Do you feel your evaluation is complete, or do you need to continue down the kinetic chain? Why or why not?
   - Evaluation of the foot, gait and foot mechanics would reveal if foot biomechanical problems were contributing to this athlete's condition

11) How do you treat this condition?
    - Minimize running and jumping until symptoms subside, followed by a functional progression back into these activities
    - ITB heating and stretching to increase the extensibility of the ITB
    - Correct ilium rotation through muscle energy techniques or through chiropractic referral
    - Core strengthening program to increase pelvic stability
    - Possible compression tape superior and/or inferior to the knee for athlete's comfort
    - Orthodics, if a foot biomechanical dysfunction was found

Lateral Collateral Ligament Sprain

During a wrestling match, one man was in a figure 4 position when his opponent pulled on his lower leg. He collapses and was unable to continue the match. When you get out to him on the mat, he states he heard a "pop" in his knee. He is panicked because he has a history of knee injury from a car accident.

6) How do you handle the situation? Do you perform your evaluation on the mat, or do you move him off the mat first? What judgment calls do you make first?
   - Perform a primary assessment to determine if he can be moved.
   - Where is the pain?
   - Palpation of the pain
   - Can he move his leg?
   - ACL, PCL, MCL, LCL stress tests to determine stability

7) A Lachman's is negative, as is Posterior Drawer and Valgus stressing. Varus testing is positive within the athlete's range. His ROM is limited to 25% of his normal range. His pain is on the lateral aspect. With this information, what judgment calls do you make?
   - Depending on the athlete's demeanor, it is probably best to assist him off the mat. He will need to be moved at some point.
   - You suspect a LCL injury and believe his ACL is intact.
   - Once he is off the mat you will have more time to perform your evaluation and talk to the athlete.
   - If he is unwilling to move, you need to take his needs into consideration and act accordingly.

8) Once off the mat, how do you continue your evaluation?
   - Palpation
   - Finish special tests

9) He is point tender over the lateral aspect of his knee. You cannot perform McMurray's due to pain and ROM restrictions. What pathology do you suspect?
   - LCL sprain
   - Lateral capsule sprain

10) What is your immediate treatment of this suspected injury?
   - Ice
   - Anti-inflammatories if a collegiate athlete
   - Elevation
   - Compression
   - NWB with crutches
   - Physician referral due to athlete's concerns regarding his knee history

Knee Medial Capsule Sprain

During a high school football game, a wide receiver comes hobbling off the field during the first series of the opening game of the season. He attempts to run with his right leg straight, and he collapses when he reaches the sidelines, crying from pain. As the athletic trainer, you happen to be standing next to him, so immediately you ask him where it hurts. He says his knee. When you ask him where, he points to the lateral aspect. You ask him what happened, and he says he took a helmet to his knee.

9) The athlete is insistent that he needs to go back in the game. What do you do to manage the situation?
   - Perform a preliminary evaluation
   - No participation until clearance after completion of the evaluation

10) No deformity or swelling is apparent. The entire lateral aspect of his knee is tender to palpation. A Lachman's is negative. The athlete is able to flex and extend his knee, but most importantly, is unable to run down the sidelines. What is your next course of action?
   - Withhold him from the game
   - Initiate a complete evaluation

11) When you ask him exactly what happened, he reports that he was planted when he got hit. You ask him if it was the same knee as last year, because you remember that this athlete had sustained a 2nd degree MCL sprain during basketball season. He confirms it is the same knee. You are concerned because you know that the athlete's doctor only required him to sit out for 1 week last year post injury and his MCL did not sufficiently scar down. The athlete was also not consistent in wearing his knee brace and was not wearing it in this game. Are there any aspects of his previous injury which would concern you regarding his present complaints? How will this affect your evaluation?
   - Re-injury to his MCL
   - If the MCL did not scar down, stress-testing will not be as indicative as it would have been pre-injury.
   - ACL sprain or rupture secondary to a valgus moment of the knee

12) Upon evaluation, the lateral aspect of the knee is extremely tender to palpation making stress testing impossible. What do you do?
   - Ice for analgesia

13) After icing the athlete's knee for 20 minutes, you are able to touch his knee without hurting him. A Lachman's and Posterior drawer are negative. Lateral structures are not painful. Valgus stress-test at 30 degrees reveals significant gapping with a boggy end-point. The athlete jumps on the table in pain. You

calm him and test the other leg at 30 and 0 degrees, which reveals minimal gapping with a solid end-point. You return to the injured leg and palpate the medial capsule and the MCL, both are tender. What pathology do you suspect?

- Re-injury to his MCL
- Potential medial capsule injury
- Lateral knee contusion

14) You continue to think through the facts, and wonder what the extent of the injury is. You realize you did not complete your stress-tests on the athlete. You Valgus stress-test him at 0 degrees which reveals severe gapping with no end-point. Your impression is that you could dislocate the tibia right off the femur; this is not painful for the athlete. You repeat the stress-test at 30 degrees, which reveals significant gapping with a boggy end-feel, the same as before. Now what injury do you think this athlete sustained?
    - 2+ degree medial capsule sprain

15) What do you do now to manage the situation?
    - Talk to his parents after the game and suggest they make an appointment with their family physician.
    - Immobilize the knee

16) Should the athlete be taken to the emergency room?
    - No: this is not a medical emergency.

Osgood-Schlatter Disease

During basketball season, one of the high school boys comes to you complaining of knee pain.

2) How do you initiate your evaluation, and are there any specific questions you should ask?
   - History
     - How old is he?
     - In what sports does he participate?
     - When does his knee hurt?
     - Where does his knee hurt?
     - How long has his knee been hurting?
     - Was there anything that happened that initiated his knee pain?
     - Other questions may be appropriate and will need to be assessed on an individual basis

2) He informs you he is a freshman, and is 14. He is currently playing basketball, but he also plays football in the fall and baseball in the spring. He also plays in a summer baseball league. He does not remember when his knee started hurting. But it has been bothering him for awhile. It hurts the most to run, jump, and squat in his catcher's stance, and it hurts in the front of his knee. Based upon the known information, at this point, what pathology do you suspect, and why?
   - Osgood-Schlatter Disease
   - At his age his symptoms might indicate patellar tendonitis, but are most likely indicative of a growth plate pathology.

3) Once the history portion of your evaluation is complete, how do you continue your evaluation?
   - Observation and palpation

4) His tibial tuberosity is enlarged compared to the contra-lateral leg. He is point tender over the distal aspect of his patellar tendon and tibial tuberosity, particularly when pinched. Crepitation is felt. What is the next aspect of your evaluation?
   - ROM
   - Strength Testing

5) Range of motion is full, with pain felt during full flexion. Knee extension is 4/5, with pain felt over his tibial tuberosity. What pathology do you suspect?
   - Osgood-Schlatter Disease

6) Describe the condition listed in #5. What is it? How is it caused?

- Osgood-Schlatter Disease is an apophysitis of the proximal tibia. An apophysis is a bony outgrowth to which muscles attach. Osgood-Schlatter Disease is believed to be caused by the repeated avulsion of the patellar tendon at the apophysis of the tibial tubercle.

7) How is this condition initially managed?
   - Cessation of painful activities until the epiphyseal union occurs: no jumping, squatting, and excessive running
   - Isometric strengthening of the quadriceps and hamstrings
   - Ice for analgesia post activity

Patellar Facet Inflammation

At the beginning of the school year, a men's basketball player enters the athletic training room complaining of a "weird" feeling in his knee. He thought he should get it checked out before the season started.

5) How do you initiate your evaluation, and are there any key questions that can aid you with the evaluation?
   - History: when did it start, what makes it hurt, where does it hurt, what activities has he been participating in?

6) The sensation has been there for a few weeks, but he does not feel it all the time. He feels it when he extends his leg all the way. He feels it on the outside of his "knee cap". He has been jogging for aerobic fitness, but his knee feels fine when he jogs. He has not been playing any basketball. He has been working all summer in a hardware store which requires a lot of squatting to stock shelves. The sensation is not pain, but a "weird loose feeling". What are your next steps in evaluation?
   - Observation
   - Palpation
   - ROM

7) The lateral border of his patella is a little "puffy" compared to the other leg. Otherwise observation reveals a symmetrical, unremarkable knee. Patellar tracking is normal. Palpation of the superior-lateral facet produces pain. Patellar ROM is normal. Pain is only elicited when the patella is pushed superior-laterally. Knee ROM is full, with pain elicited upon full passive extension. What pathology do you suspect from the current information you have? What is your next evaluative step?
   - PFD
   - Patellar subluxation
   - Special tests: patellar compression, apprehension

8) Patellar compression reproduces pain. Patellar apprehension is negative. What pathology do you suspect?
   - Inflammation of the superior-lateral patellar facet or PFD

Patellar Tendonitis

(This scenario may require unconventional thinking.)

A men's basketball player indicates one day in the pre-season that he has pain around his knee cap. He indicates that he has a history of patellar pain, but recently it has become more irritated as his physical activities have increased.

2) How do you initiate your evaluation?
   - Complete the athlete's history: when does it hurt and what makes it feel better?

2) He has difficulty with accelerating and decelerating, jumping, and running and jumping exercises. It is difficult for him to walk around for long periods of time. He experiences the most relief when he rests for a period of time doing minimal physical activity. What is your next step in evaluation?
   - ROM

3) Patellar mobility is good medially to laterally. Superior to inferior mobility produces pain, both from the pressure on the distal pole of the patella, and within the range. Knee ROM is limited in terminal knee extension with moderate pain. Knee flexion is limited past 90 degrees, also due to pain. He has difficulty squatting. What pathology do you suspect?
   - Patellar Tendontis

5) What is the differential diagnosis for the suspected condition?
   - Crepitis and pain in the tendon with palpation

8) What other pathologies might this athlete have?
   - Fat pad inflammation
   - PFD

9) How long does this condition typically last?
   - Chronic

10) Are there any specific modalities you would use, why? Outline the settings for those modalities.
   - Heat pre-participation to increase blood flow to the tendon
     - WWP x 10-15 minutes to warm the whole leg
     - HP x 15 minutes for isolated heating to the anterior knee
   - Ice post-participation for analgesia
     - CWP x 15-20 minutes to effect the whole leg

    - Ice massage x 5-10 minutes, or until analgesia to isolate the patellar tendon
- US, non-thermal: decrease sub-acute and chronic inflammation and increase cell permeability and collagen synthesis
  3 Mhz, 100% duty cycle, .5 w/cm2 for 4 minutes (for 1 degree)
  3 Mhz, 100% duty cycle, .5 w/cm2 for 7 minutes (for 2 degrees)
  3 Mhz, 100% duty cycle, 1.0 w/cm2 for 4 minutes (for 2 degrees)

10) How do you help prevent this from becoming a chronic problem?
    - Early treatment
    - Possible us of orthodics if a lower cross system is involved
    - Minimization of exercises that cause irritatation

Pes Anserine Tendonitis

(This scenario might require unconventional thinking.)

In the middle of September, a tennis athlete enters the athletic training room, stating that her knee hurt and she was tired of trying to deal with it.

5) How do you initiate your evaluation?
   - History: when did it start? What does it feel like? Any precious knee injuries? Where does it hurt?
   - Calm the athlete down and talk to her about her attitude. She will need to remain positive if she is going to heal quickly. Assure her you are here to help her, but you need her assistance as well.

6) She indicates to you that she has a substantial history in this knee. She has had three surgeries in the past two years. Her last surgery was two months ago. Is there any other history information needed from this athlete?
   - Purpose for the surgeries
   - Any rehabilitation done
   - Type of pain now as compared to before surgery
   - Current activities after last surgery
   - Duration of pain symptoms

7) She indicates that each surgery was arthroscopic, looking for meniscus tears, but no tears were ever found, so "nothing" was ever performed. She has been to a lot of physical therapy, including three times a week for the four weeks after surgery, until she came to school. Since then, she has been playing tennis with the team. She ices it every day after practice, but it hurts, and she has a swelling problem down into her calf and foot. Her pain is the same as before surgery and she always has pain. But her pain worsens during play and remains throughout the night. How do you continue your evaluation?
   - Observation
   - ROM
   - Strength testing

8) Observation indicates her right knee has mild swelling compared to the left. ROM is almost full, lacking terminal extension and full flexion. Pain is only felt at the end-ranges. Over-all strength in the right leg is diminished compared to the left. The right quadriceps will not contract completely, and the VMO is atrophied, resulting in a mild inverse "J" sign. What is your next step in evaluation, and what are your thoughts on possible injuries to this athlete?
   - Palpation
   - PFD

- Lacking full recovery after last surgery, especially of strength

7) Palpation indicates tenderness across the medial tibial plateau and tibial flare. She also has mild peri-patellar pain. What is your next step in evaluation? Are there any changes in your thoughts on injuries to this athlete?
   - Special tests
   - No change, however pes anserine tendonitis is another possibility

8) A Lachman's is negative, as are Posterior Drawer, Varus and Valgus stressing, and McMurray's. Ober's test is positive. Based on your findings, what is your assessment?
   - Weakened musculature around the knee from neuromuscular shut-down secondary to surgery

15) What is your treatment plan for this athlete?
   - VMO strengthening
   - Quad strengthening
   - Hamstring strengthening
   - Adductor strengthening
   - Increase ITB extensibility

16) What exercise is the most effective for VMO strengthening?
   - Backwards walking, with the heel of the leg extended in front of you digging into the ground
   - Knee extension with adduction

17) As her therapy progresses, she shows signs of improvement. Her swelling decreases, her neuromuscular control improves, and her pain decreases. She continues to participate in tennis drills to tolerance, but does not play in any matches. However, one day after practice, she indicates that she is in a lot of pain and that her coach had made her play a challenge match that day. You treat her symptomatically for pain, but she never recovers. Despite trying cold, heat, TENS, EMS, compression wraps, and cessation of play, her pain has increased over the last week. How do you handle this situation?
   - Re-evaluate this athlete

18) Re-evaluation of the athlete reveals that her ROM has improved, but still lacks full flexion. Palpation indicates tenderness along the medial tibial flare, but not over the medial joint line. Further palpation isolates her pain to her Pes Anserine. Crepitation is felt. Strength testing is 4/5 with pain in adduction and knee flexion. All special tests are negative. What pathology do you suspect?
   - Pes Anserine Tendonitis

19) Is your evaluation complete? Is there any other information needed at this time? Why?
    - Foot biomechanics and posture evaluation to rule out biomechanical stress as the cause of injury

20) Her feet reveal severe pronation and pes planus. Her walking biomechanics reveal forefoot varus and excessive toe-out compensation. Are there any relevant questions to ask this athlete?
    - Does she have any back pain?

21) She indicates that she has not had back pain in a long time. But, she "had" scoliosis when she was younger. At her last x-ray, which was probably 6 years ago, she had a 25-degree curvature. One of her legs is functionally longer than the other. She indicates that she never told you because she did not think it was important. What is your impression of this athlete's present condition?
    - Pes Anserine Tendonitis due to her body's compensation from her scoliosis. Her feet are compensating for her leg length discrepancy, which is probably caused by pelvis changes made to compensate for her spinal curvature. All these forces increase the strain on her knees, resulting in pes anserine tendonitis. This pain was probably the cause of her pain for the last two years, which resulted in three surgeries where nothing significant was found.

22) What is your next course of action regarding this athlete?
    - Physician referral to reveal her present degree of scoliosis, and to determine what steps should be taken to manage this condition without altering her scoliosis.

Poplitial Tendonitis

A wrestler enters the athletic training room before practice, complaining of knee pain.

2) How do you initiate your evaluation, and what does that step entail?
   - History: onset, location, quality of pain, event that may have caused pain

3) His knee pain has been getting gradually worse over the last couple weeks. His pain is posterior-lateral. It is a dull ache, but sometimes is sharp. It hurts off and on throughout the day. He has not been able to figure out what makes it worse, except for running, wrestling, and sitting Indian style. He has no history of knee injury or trauma. What is your next step in evaluation?
   - Observation of: knees and posture
   - Palpation

3) His knees are symmetrical bilaterally. His posture indicates a slight anterior tilt to his pelvis. All other aspects of his postural observation are normal. He is point tender anterior to the LCL and on the posterior knee, distal to the joint. How do you continue your evaluation?
   - ROM
   - Strength testing
   - Special tests

4) He has full range of motion and full strength with knee flexion and extension. Varus stress testing is negative. Ober's test is negative. What pathology do you suspect? What is the differential diagnosis for that condition?
   - Poplitial strain or tendonitis
   - Pain in figure 4 position; pain with terminal extension and external rotation and resisted knee flexion from TKE in internal rotation

6) Figure 4 position is painful. He also has pain when resisted in the first 30 degrees of flexion when in internal rotation. Are your suspicions correct and what is the next step in treatment?
   - Yes
   - Minimize exercises that cause irritatation
   - Modalities to treat symptoms: heat pre, ice post, US, EMS for pain if necessary
   - NSAIDS

Pre-Patellar Contusion

During wrestling practice, a wrestler takes a shot, hitting his knee on the mat. He is unable to finish practice, or bear full weight on his right leg.

9) How do you initiate your evaluation, and are there any key questions that can aid you with the evaluation?
   - History: any previous knee injuries?

10) He has no recent history of knee injury. He feels like there is this constant pressure on his knee. When he tries to move, the sensation becomes sharp pain. What is your next step in the evaluation process?
   - Observation

11) Observation reveals nothings significant, except that he is guarding his leg. What is your next evaluative step?
   - Palpation

12) The athlete is point tender over the patella and the immediately surrounding area. All other aspects of the knee are not painful upon palpation. What are your next evaluative steps?
   - ROM
   - Strength testing

13) His ROM is limited to approximately 10 degrees, within the midrange. Strength testing is impossible due to pain. All other aspects of the knee are not painful upon palpation. What is the next step in your evaluation?
   - Stress testing

14) A Lachman's is negative, as is Varus and Valgus testing. Patellar Gliding is extremely painful. What pathology do you suspect?
   - Patellar contusion
   - Patellar fracture

15) Are there any other diagnostic tools you might use to narrow your assessment?
   - Tuning fork, however it might give a false positive

16) How do you manage the situation?
   - NWB with crutches
   - Refer to physician for x-rays

THE THIGH, HIP, GROIN AND PELVIS

Gluteus Medius Strain

During the second week of double days, a women's soccer player approaches you during practice. She has her right hand on her hip and sticks her right hip out as she walks. She states that her right "glut" hurts.

7) How do you initiate your evaluation, and are there any key questions that can aid you with the evaluation?
   - History: how long has it been hurting? Was there any specific event that caused her initial pain? What makes it hurt? Where specifically does it hurt?
   - Describe the pain

8) She does not remember anything specific happening to cause her pain. She reminds you that she sustained a quad contusion 1 week ago which limited her practice for a few days, but she's been back to full practice for 3 days now. She thinks her glut has just been feeling tight for the last week. She has pain in the morning when she feels stiff, and at the beginning and end of practice. Today she reached a point where she could not continue. What type of pathology could she have from this information? What are your next steps in evaluation?
   - Muscle strain
   - Palpation
   - ROM
   - Strength testing

9) Palpation indicates pain on the posterior aspect, inferior to the iliac crest. She has pain with hip flexion and some discomfort during hip extension. All other ranges are full and non-painful. MMT of the gluteus maximus is 5/5. How do you isolate the gluteus maximus?
   - With the athlete prone and the knee flexed to at least 90 degrees, the athlete then extends the hip
   - Flexing the knee eliminates contributions from the hamstring.

10) Manual muscle testing of the gluteus medius is 2/5. What does that mean, and how is that test performed?
   - 2/5 means that the athlete can move her hip in a gravity-eliminated position through the full range of motion.
   - The gluteus medius is tested by positioning the athlete on the unaffected side and have her abduct her hip. This position is gravity-dependent.
   - To eliminate gravity, she would lie on her back or stomach and abduct her hip.

11) What is your next evaluative step?
   - Special tests: Trendelenburg's test

12) After holding the position for a few seconds, the left hip drops compared to the right side. Is this a positive or negative finding? What does this finding indicate?
    - It is a positive finding
    - This indicates weakness of the gluteus medius on the opposite side. The opposite side drops to try and maintain the center of gravity and minimize the use of the affected gluteus medius.

Legg-Calve-Perthes Disease

A non-athlete enters the collegiate athletic training room asking if you will look at him. He has been experiencing hip pain, almost as long as he can remember, but now the pain is horrible and constant.

2) Do you evaluate this person?
   - Depends upon your department's insurance policy

2) Your insurance plan has a clause for coverage of non-athletes. What information do you need as you start your evaluation?
   - History: activities, type of pain, what makes it better or worse

3) He reports never participating in athletics. He thinks he has had hip discomfort since junior high, so he never pursued athletics. He does not hurt at night when he is sleeping, but he hurts to sit or getting in or out of cars. It would be impossible for him to sit Indian style. The pain is a constant ache, which can turn to a sharp, stabbing pain with those positions previously mentioned. What is your next step?
   - Gait evaluation
   - Observation
   - Palpation

4) His gait is normal, but painful. His posture reveals a slightly anteriorly rotated pelvis. He is about 5'10", weighing around 160 pounds. He has no point tenderness with palpation. What is your next step in evaluation?
   - ROM
   - Strength testing

5) He has decreased hip internal rotation and abduction, but all other ranges are full. He has diminished strength when in flexion with external rotation, but all other directions are full. What is your next step?
   - Special tests

6) Hip scouring is painful, as is Patrick's. What pathology do you suspect?
   - Hip degeneration
   - Legg-Calve-Perthes Disease
   - Muscle imbalance

7) If he weighed around 250 pounds, how would that change your suspected pathology?
   - Could be slipped femoral epiphesis

9) What do you tell this student?
   - You suspect he has some hip degeneration, and he should see a physician and get x-rays.

In this case, his x-rays were negative, but MRI showed Legg-Calve-Perthes Disease.

Hip Pointer

A high school football walks off the field after a play and approaches you complaining of pain above his hip. He was involved in the "pile" during the last play and felt a helmet hit him hard around his hip. He hurts, and he is scared about what is wrong with him.

3) How do you handle the situation?
   - Calm him down
   - Have him breathe steady and slow
   - Assure him that you can work together and determine to determine the problem

4) He is calmer after you talked to him. How do you initiate your evaluation?
   - Complete his history
   - Observation
   - Palpation

4) His hip is the only place he hurts. He has never hurt his hip before. He has no pertinent health history. Observation reveals his right hip is swollen and red over the iliac crest. The Iliac crest is not visible due to the swelling. The area is TTP, with crepitus and increased tone noted. Before progressing with your evaluation, what pathology (s) do you suspect?
   - Hip Pointer

5) How do you continue your evaluation?
   - ROM

6) His range of motion is immeasurable due to pain. All movements of the trunk hurt, as well as movements of the legs. Based on these findings, what is your next evaluative step, why?
   - Neurologic testing to rule out neurovascular trauma to the hip

7) He has full sensation and is capable of movement, even though moving is painful. What pathology do you suspect?
   - Hip Pointer

8) Will this athlete return to the game, why?
   - No
   - His lack of ability to complete his hip and leg range of motion prohibits him from returning to the game.

9) How is the condition listed in #6 managed?

- Conservative treatment consisting of rest, ice, possible anti-inflammatories, possible non-weight bearing on crutches if weight bearing is too painful, hip pointer pad for comfort or compression wrap

10) Why would trunk and leg range of motion be painful with the condition given in #6?
    - Trunk motion: due to the use of the contused muscles that attach on the iliac crest
    - Ipsilateral leg motion: due to the use of the muscles that attach on the ilium
    - Contra-lateral leg motion: due to the stabilization and muscular control required of the injured leg to execute motion on the contra-lateral leg

Quad Contusion

A softball player enters the athletic training room, walking with a stiff knee gait. Yesterday during pre-game, she ran into the outfield fence while catching a fly ball and hit her leg against the fence pole. She played the game, but today is stiff and has difficult moving.

2) Is there any more information you need to know? After the history is complete, how do you initiate your evaluation?
   - History is complete
   - Observation

2) There is swelling and ecchymosis over her right quadriceps. What is your next step in evaluation?
   - Palpation

6) She is painful over her rectus femoris. What pathology do you suspect?
   - Quad contusion

7) What are your next steps in evaluation?
   - ROM
   - Strength testing

8) She has approximately 60 degrees of ROM, with decreased strength on MMT 4/5. Do these findings change your pathology suspicions?
   - No

6) What would be your therapeutic goals for this athlete?
   - Decrease pain, swelling and ecchymosis
   - Increase ROM and strength

8) In the management of this condition, what other secondary injuries do you need to help avoid?
   - Possibility of developing myositis ossificans

Trochanteric Bursitis

A women's water polo player complains of a weird noise in her hip that is also painful.

2) How do you initiate your evaluation?
   - History: location of noise and pain, what makes better or worse, how long has it been happening?

2) When it "pops" it feels like it is on the outside of her hip. It happens the most when she is treading water, climbing stairs, or when she gets in and out of her car. What is your next step in evaluation?
   - Observation
   - Palpation

4) Observation reveals nothing significant. Palpation reveals tenderness posterior to the greater trochanter. What are your next steps in evaluation?
   - ROM
   - Strength testing

4) Her ROM is decreased in all ranges, with popping at her lateral hip occurring towards the end-range. Strength testing produces pain with hip extension and hip adduction. How do you continue your evaluation?
   - Special tests

6) Active hip flexion and extension reveal a popping that can be palpated over the trochanter, with crepitation. Ober's is positive. What pathology do you suspect?
   - Trochanteric Bursitis

7) Explain what causes the "popping" sensation.
   - When the ITB is excessively tight up at the hip, as it passes over the greater trochanter it snaps into place, thus creating the popping sensation. This also causes irritation to the greater trochanter, resulting in an enlargement of the trochanteric bursa; thus decreasing the space available for the ITB to pass, and creating an endless cycle.

THE SPINE

Brachial Plexus Neurpraxia (Stinger/Burner)

During the first game of the high school football season at your new school, an offensive lineman runs off the field with his right arm dangling at his side. He comes to you stating he thinks he has a "stinger".

12) How do you initiate your evaluation?
    - Complete his history

13) He has had stingers before, and this feels the same. He was involved in a tackle, and he does not remember exactly what happened, but he thinks his head was forced to the left. Immediately he had a burning sensation down his right arm. Now his arm feels weak and tingly. What is your next course of action, and how do you execute your plan?
    - Rule out c-spine injury
    - Palpation of the c-spine spinous processes
    - Check grip strength

14) He has no tenderness along his spinous processes. However, he has diminished grip strength. Did you expect this finding? If so, why? If not, what did you expect? What does this finding indicate?
    - Yes
    - If the athlete did sustain a stinger as he thinks, he would have diminished grip strength until all symptoms subsided.

15) How do you continue your evaluation?
    - Palpation of the c-spine musculature
    - Dermatome and myotome evaluation

16) He can feel your touch in all areas, but he claims he feels a tingle as well. He can execute all movements asked, but he is weak in all areas. Is this finding normal or abnormal for the suspected condition?
    - Normal

17) Palpation of his c-spine musculature reveals increased tone on the right side, and tenderness over trigger points. Is the increase in muscle tone caused by his injury, or is his injury caused by his increased muscle tone?
    - Probably both
    - His muscles have tightened up to protect the c-spine, but constant increased tone may predispose this athlete to stingers if his muscles lack extensibility and if he suffers from neural tension in his brachial plexus.

18) What is your next step in evaluation?

- Special tests

19) What special tests would you perform on his athlete?
    - Brachial Plexus Traction test
    - Cervical Compression and Distraction tests
    - Spurling test

20) Brachial Plexus Traction to the left replicates symptoms. Cervical Compression and Distraction and Spurling's are all negative. Practically, what does that mean?
    - His injury was caused by a stretching of the brachial plexus, but his facet joints and neural foramina have not been compressed and narrowed, creating a problem at each individual level.

21) Is this athlete done for the night, or will he be able to return to play?
    - If his symptoms subside and he has full strength, sensation and ROM, he can return to play.

22) Should this athlete commence therapy in the athletic training room, why?
    - Yes
    - To evaluate and address neck flexibility, strength, and neural tension

Lumbar Disc Herniation

A softball outfielder enters the athletic training room in the pre-season, seeking treatment for her back. She complains of back pain.

2) How do you initiate your evaluation?
   - History

2) She has a history of low back pain since she dove for a ball over the summer (this is October). She had x-rays at the time, which were negative. But she has had increased pain for the last few weeks. What other questions should you ask this athlete?
   - Was there any event a few weeks ago that precipitated the return of her pain?
   - Did she change anything in her normal routine?

4) She reports that she had been performing dead lifts in the weight room and strained too hard on her last repetition. She felt pain in her low back that was sharp. She has had pain in her back since that day. What other information do you need for your evaluation?
   - Type of pain: does she have any radiating pain down her legs?

4) She now has radiating pain and tingling down her left leg. What pathology does that indicate?
   - Disc involvement

6) What are your next steps in the evaluation?
   - Palpation
   - ROM
   - Strength testing

7) She has palpable pain over her left lumbar paraspinals. She presents with: pain with trunk extension, side bending left and rotation right and left. She had pain and loss in active range with both hip and knee flexion 3/5. Passively she has pain with knee flexion on the left. She has no pain with knee flexion or extension, or hip abduction. However, hip adduction is 4/5 with pain. How do you continue your evaluation?
   - Special tests

8) Special tests indicate negative SI compression and distraction. FABRE was negative, but positioning of the hips produced bilateral pain. Straight Leg Raise produced pain and tingling, as did the Slump test. How do these findings affect your pathology suspicions?

- Differentially diagnoses by confirming disk pathology compared to SI problems

9) Are there any other evaluative steps, or is the evaluation complete?
   - Could be complete, or you could perform sensory testing to determine the level of the disruption

11) Sensory testing indicates paresthesia in her lower leg and foot. What level(s) does that indicate?
   - L4-L5
   - L5-S1

12) What is your next course of action?
   - Physician Referral

Spondylolysis

(This scenario may require unconventional thinking.)

A member of the men's swimming team enters the athletic training room complaining of back pain. He indicates that his back has been hurting him for awhile now, but today is the first day that he feels that he cannot continue to practice.

8) What questions do you want to ask him to complete the history portion of the evaluation?
   - Where in his back does he hurt?
   - Does he have any pain, numbness or tingling into his legs?
   - Describe the pain.
   - What makes the pain worse, and better?
   - Does he remember doing anything that could have initially caused his back pain?
   - Has he changed anything in his routine lately?
   - Any previous back injuries?
   - What is his stroke?

9) He indicates that he has no previous back injuries, although it is not uncommon for his back to be sore after swimming. His back hurts in the middle of his lumbar spine. He has no symptoms into his legs. The pain is a constant presence that is the worst after practice. Lying on his back with his legs slightly bent is his most comfortable position. The only thing difference in his practice that he can think of is the kickboard work that has been added into practice the last couple weeks. He does the breast stroke. What are your next steps in evaluation?
   - Observation
   - Posture assessment
   - ROM

10) Observation indicates an anterior tilt in his pelvis. Observation does not reveal any other significant findings. His flexion is limited, although not painful; however, returning to neutral is painful, as is hyper-extension. He has mild discomfort with rotation both to the right and left. Are there any pathologies you can rule out based on the given information, and why?
   - Disc pathologies: no symptoms into his legs, and disc pathologies cause pain in flexion, while this athlete's symptoms occur during extension

11) What is your next step in evaluation? Are there any specific tests you would perform?
   - Special tests: Single Leg Stance test
   - Lower extremity neurologic screen to verify no nerve root involvement

12) Nerve root testing produced no abnormal findings. The Single Leg Stance test increases his back pain. What last element of the evaluation is needed for completion?
    - Palpation

13) Palpation indicates paraspinal spasm bilaterally. No step-off is felt. What pathology do you suspect?
    - Spondylolysis
    - Facet Inflammation

14) What is your next course of action?
    - Physician referral for evaluation and x-rays

THE THORAX

Costochondral Sprain

During a wrestling match, a wrestler felt pain in his left side. He finished that match and iced the area. Two days later, he was unable to finish practice.

6) How do you initiate your evaluation, and are there any key questions that can aid you with the evaluation?
   - History: Does he have any recent injuries to the area, what exactly happened?

7) He does not have any recent injuries to his ribs. He does not remember what happened; he just started having pain during the match, but that is not abnormal for him. Today the pain has not subsided, and he is having some pain with breathing once he gets his heart rate up and is breathing hard. His pain is localized around his left lower rib cage. What is your next evaluative step?
   - Observation
   - Palpation

8) He has mild swelling on his left side, compared to his right. Palpation of the seventh rib is tender at the costochondral junction. There are no other significant observation or palpation findings. What is your next evaluative step?
   - Special tests

9) He has pain with transverse compression and anterior-posterior compression at the same site as your palpation. What pathology do you suspect?
   - Costochondral sprain
   - Intercostals strain

10) Are there any other diagnostic procedures that should be performed? If so, what and to determine what pathology?
   - Listen to lung sounds to verify all lobes are functioning

Scrotal Infection

A male high school track sprinter approaches you at practice and complains of pain in his right groin. He says it hurts to start, stop and sprint. It only hurts him at practice, never any time else. It has been getting more noticeable over the last week.

2) What is the most likely pathology based on the information given?
   - Adductor strain

5) How do you initiate your evaluation?
   - Observation
   - Palpation

6) Observation reveals nothing significant. His posture is symmetrical, although he has a slightly anteriorly rotated pelvis. He has no palpable pain. What are your next steps in evaluation?
   - ROM
   - Strength testing

7) His ROM is full in all directions, as is strength testing. What is your next step in evaluation?
   - Special tests

5) Hip scouring is negative. 90-90 straight leg raise indicates good hamstring flexibility. FABRE test is negative. Trendelenburg's test is negative. Thomas test indicates flexibility could be increased in his hip flexors, but not pain is felt. Ely's test is negative. After finding nothing significant, what is your next step?
   - Ask the athlete more questions regarding his pain

7) After more questioning, he states that the pain is always high in his groin, but he can never touch it himself. It does not hurt to sit or stand. But over the last couple days, he has had a little irritation with urination. What pathology do you suspect?
   - Scrotal infection or irritation
   - Testicular injury or condition
   - Bladder infection
   - STD

8) How do you manage this situation?
   - Advise him to have his parents take him to his primary care physician.

In this case, he suffered from a scrotal infection that was treated with antibiotics.

THE HEAD AND FACE

Facial Laceration

During a women's basketball game, you observe your point guard face plant on the floor after taking an elbow in her face. She stands immediately, but is disoriented and unstable on the court.

8) What is your first course of action?
   - Have her removed from the court to perform an evaluation

9) While you approach the coach, the athlete starts gushing blood from her face into the floor. How do you handle the situation?
   - Direct the athlete off the court
   - Give her a towel
   - Instruct her to keep her head down to drain the blood
   - Verify that blood is cleaned off the court according to your site policies: responsibility of yourself, host team, other personnel assigned to floor clean-up

10) Once the court is being tended, what is your next course of action?
   - Glove up
   - Perform head evaluation to rule out brain involvement

11) All cranial nerves are intact, the athlete is oriented, and no concussion is suspected. How do you continue your evaluation?
   - Remove the towel to observe her nose

12) As she slides the towel down her nose, you see a laceration on the left side of her nose. It is approximately 1 inch long. Upon palpation of the surrounding tissue, the laceration gaps open, revealing all internal structures located under the dermal layers. She is also bleeding from her nasal passages. How do you manage the situation?
   - Replace the towel for compression
   - Arrange for stitches with a physician, either through physician on call, or through physician referral

13) The team physician is on her way to stitch up the athlete. While you wait, how do you continue to manage the situation?
   - Apply direct pressure on the nose to minimize bleeding
   - Observe the athlete and perform any re-evaluation as necessary to ensure that a head injury does not manifest in the next 20-30 minutes.

14) This athlete returns to play 10 days later. Are there any precautions that need to be made to protect the athlete during participation?

- Face mask needs to be worn to protect her nose. If her nose is not fractured, the mask needs to be worn until her laceration heals. If her nose is fractured, the mask will need to be worn for a longer period of time, probably determined by the team physician.

Hematoma Auris

After practice, a wrestler complains of pain, heat and pressure over his ear. His skin is red and hot over the superior half of the cartilage. Cartilage definition is minimal from swelling superficial to the cartilage.

5) What pathology do you suspect in this wrestler?
   - Hematoma Auris or Cauliflower ear

6) How do you manage this condition?
   - Treat for inflammation: immediate ice for vasoconstriction (a physician may choose to aspirate)
   - Anti-inflammatories
   - Work up head gear for full ear protection
   - Avoid direct pressure on the ear during ADLs
   - Consult a physician for possible methods to prevent swelling, including collodian ear impression or sewing a button to the ear

7) What are possible complications of this condition?
   - Continued growth of the cartilage resulting in possible hearing loss.

8) Will this ear ever return to "normal"?
   - Not likely, but possible with early correct treatment.

Tooth fracture

On a basketball road trip, one of the men's players decides not to wear his mouth guard. Almost immediately he takes an elbow to his mouth, doubling over with his hand over his mouth. You approach him and ask him to remove his hand. He does and you see pieces of teeth in his palm. When he smiles at you, you see he is missing the bottom half of his four top front teeth with the roots still intact.

4) How do you manage the situation?
   - Check for head injury
   - Look for associated lacerations
   - Check the stability of the teeth.

5) In the absence of a head injury, the athlete is not bleeding, but his teeth are sensitive to air and water (cold). All teeth are stable. Is this an emergency? Can this athlete continue to play?
   - This is not an emergency. The athlete can play if he is able as long as he wears his mouth guard for protection and minimization of discomfort.

6) When should he be referred and who should he see?
   - After the game to a DDS

THE SHOULDER

Acromioclavicular Sprain

During wrestling practice, a wrestler was dropped, landing on the tip of his shoulder. He continued to practice and felt minimal pain, except when he "extended" his arm or landed on his shoulder. He approached you after practice to make sure that he was okay. He has never before hurt his shoulder.

7) How do you initiate your evaluation?
   - Complete his history

8) He thinks he was about 1 foot above the mat when he was dropped onto his shoulder. The impact hurt, but he was able to continue practice. If her were to lift his arm, his shoulder would hurt. How do you continue your evaluation?
   - Observation
   - Palpation

9) Observation reveals visible edema around his left AC joint. He is point tender over his AC joint. What is your next step in evaluation?
   - ROM

10) His ROM is diminished with pain at the end-ranges of flexion and abduction. What is your next step in evaluation?
   - Strength Testing

11) Strength testing produces pain in flexion, abduction, and shoulder shrugging. How do you continue your evaluation?
   - Special tests

12) He has a positive piano key test and pain with inferior humeral distraction. What pathology do you suspect?
   - 2nd degree AC sprain

8) What is your immediate treatment and long term timeframe for return to participation?
   - Ice for inflammation from practice and analgesia
   - When symptoms subside he can return to full practice. Until then, he can participate in drills that do not involve the possibility of being dropped onto his shoulder, which will exacerbate his condition.

Biceps Rupture

During half time of a collegiate football game, a middle line backer tells you he had felt a "pop" in his shoulder. He had reached to tackle somebody, grabbing his opponent's jersey, and slipped. (It was a rainy game.) When he slipped, he felt the "pop" in the front of his shoulder. He had continued to play through the rest of the half.

9) How do you initiate your evaluation?
   - Observation
   - Palpation
   - ROM
   - Assess strength

10) The athlete looks symmetrical bilaterally. Palpation reveals tenderness over the coracoid process. ROM and strength are full, without pain. The team is now ready to return to the field for the second half. Do you continue with your evaluation, why or why not?
   - At this point, no. The athlete has full strength and ROM. Athlete can play if able, but should come into the athletic training room after the game for a complete evaluation.

11) The athlete was able to play effectively throughout the second half. What do you do after the game for this athlete?
   - Re-evaluate: observation, palpation, ROM, strength

12) He presents with a palpable asymmetrical mass on the medial side of his biceps. It is painful to touch. He is also point tender at the coracoid process. Shoulder and elbow ROM are full. What do you suspect?
   - Biceps rupture of the short head

13) What is the differential diagnosis or evaluation you do to confirm your suspicions?
   - MMT of the biceps

14) The athlete is able to flex his arm and supinate his forearm, although his strength is 3/5 and he indicates some pain. What is your next step in evaluation?
   - Biceps special tests to indicate the extent of involvement of the short and long heads: Yergason's, Speed's, Ludington's, Neer's

15) All biceps special tests are negative. What does that implicate?
   - The athlete sustained an injury isolated to the short head, the long head was not affected or involved

16) What is your next course of action?
    - Ice to decrease pain and spasm
    - Refer to the physician for immediate treatment.

Bicipital Tenosynovitis

A baseball player approaches you during practice, wanting to share with you a "cool" thing with his shoulder. He says his right shoulder squeaks when he moves it. He wonders if you know why it squeaks.

10) How do you initiate your evaluation? Explain the demeanor you use so as not to scare the athlete regarding his potential injury
    - Complete his history
    - Calm, curious, interested

11) His shoulder has been squeaking for a few weeks. He has pain when he raises his arm in front of him. He states that he has never "injured" his shoulder; however, he has always had some tendonitis during his years of playing. He just "deals with it". Sometimes it hurts when he gets up in the morning. What type of pathology do you suspect at this point? Why?
    - Tendonitis or tenosynovitis
    - Tenosynovitis is characterized by a squeaky noise caused by a tendon sliding through its synovial sheath which is inflamed and decreasing the space available for the tendon to pass

12) How do you continue your evaluation? Are there any specific signs or symptoms you would use to differentially diagnose the injuries you suspect in #2?
    - Observation
    - Palpation
    - Presence of an audible squeak from the tendon with movement

13) Observation reveals his right arm is slightly lower than his left. Otherwise, all findings are normal. Palpation reveals pain and snowball crepitis in the inter-tubercular groove. What are your next steps in evaluation?
    - ROM
    - Strength testing

14) Shoulder flexion is full, but painful at the end-range. All other ranges are full and non-painful. Strength testing is full in all directions. What is your last step in evaluation?
    - Special tests

15) Positive special tests are: Neer's, Yergason's, Speed's, Hawkins-Kennedy, and O'Brien's. Are your suspicions correct regarding what type of pathology you suspected in #2?
    - Yes

16) What is this athlete's specific pathology?
    - Tenosynovitis of the long head of the biceps

17) What is the ideal way to treat this injury?
    - Rest from over-head activity until the inflammation decreases

18) Describe a rehabilitation plan you might enact for the first two weeks of rehabilitation.
    - Heat
    - Friction massage/STM
    - Postural awareness
    - Pectoralis stretching
    - Easy strengthening exercises in a symptom free range
    - Anti-inflammatory ultrasound for a two week cycle over the site of squeaking in the tendon

Multi-Directional Instability

After practice, a tennis player enters the athletic training room with complaints of shoulder pain. She has a history of asymptomatic asymmetrical scapular rhythm and is presently on a rotator cuff strengthening program.

8) What additional information do you need regarding her history?
   - What happened to make it hurt now?
   - What happened over the week-end?
   - Has she been playing tennis?

9) She reports that her shoulder has been feeling achy and when she plays tennis there is a "pop" around her scapula. She has been icing it after playing. However, yesterday she was in the front seat of her car, and she reached behind her to grab something when she felt sharp pain in the front of her shoulder. She then played tennis this morning and is now feeling extreme pain. What injuries do you think she might have just from this description? How do you continue your evaluation?
   - Impingement of supraspinatus or biceps long head
   - Inflammation from an acute subluxation
   - Multi-directional instability
   - Observation
   - Palpation
   - ROM

10) She is point tender over her coracoid process, biceps long head, and greater tubercle. Observation reveals her shoulder is significantly lower than the contra-lateral side. She is unable to lift her arm to 90 degrees without pain. At 90 degrees, her shoulder hesitates and performs a visible "zig-zag" motion before continuing in the range. She indicates that the "zig-zag" is painful and feels like a "pop". Do you suspect any pathology at this point?
   - Multi-directional instability

11) How do you continue your evaluation?
   - Special tests

12) Special testing reveals positive: Drop Arm test, Apprehention, Relocation, Hawkin's, Yergason's, O'Brien's. What do these results indicate?
   - Primary and Secondary Impingement with Rotator Cuff shut down

13) What pathology do you suspect?
   - Multi-directional instability

14) What is your next course of action?
    - Use of a sling. This arm should not be used due to the rotator cuff shut down. Rest is required to allow the shoulder joint time to calm down. Physician referral and MRI to determine extent of joint damage.

FOR ADVANCED STUDENTS

11) What type of rehabilitation strengthening and stretching exercises would you do for this athlete?
    - Minimal stretching due to the laxity and hyper-mobility of her shoulder
    - Strengthening of:
        - rotator cuff: shoulder extension, IR, ER, full can
        - scapular stabilizers: push-ups, alphabet on thera-ball, lower trap shoulder hyper-extension, rows
        - pectoralis major and minor
        - avoid push-up plus in this athlete due to her laxity and angle of instability (90degrees)

12) Are there any modalities that would use beneficial for this pathology? If there are, what are they? If not, why?
    - No
    - Heat and cold can help make the athlete more comfortable, however, the use of modalities will not help this shoulder heal. This shoulder requires surgery

13) If this athlete had surgery (capsular shrinkage), what would be your rehabilitation goals for:
    a. Phase I rehabilitation
    b. Phase II rehabilitation
    c. Phase III rehabilitation

    Phase I Therapeutic Goals
    - Instruct proper carrying and use of the affected arm during activities of daily living
    - Maintain an optimal healing environment of the tissues through modalities
    - Minimize muscular atrophy and strength loss in the arm
    - Retard adhesion development in the shoulder
    - Maintain overall physical fitness

    Phase II Therapeutic Goals
    - Establish proper arm carrying
    - Restore ROM in the shoulder
    - Restore flexibility
    - Restore muscular strength

- Restore muscular endurance
- Maintain over-all physical fitness

Phase III Therapeutic Goals

- Continued restoration of joint ROM, flexibility, muscular strength and endurance
- Development of overall fitness
- Re-establish normal patterns of motor activity
- Sport specific exercises
- Restoration of athlete's confidence

Phase IV Therapeutic Goals

- Maintenance of muscular strength, endurance and flexibility

12) What types of strengthening exercises would you do differently for each of these stages?

Phase I

- Easy shoulder ROM as tolerated by surgical restrictions
- Elbow ROM and strengthening as much as possible without disrupting the shoulder
- Wrist and hand ROM and strengthening as tolerated

Phase II

- Rotator cuff strengthening and scapular stabilization
- Elbow strengthening with no restrictions
- PNF exercises to improve neuromuscular coordination

Phase III

- Sport specific activities
- Exercises with the arm above 90-degrees of flexion or abduction
- Incorporate the use of the racquet
- Combine shoulder, elbow and core exercises together

Phase IV

- Maintain gains with exercises that work rotator cuff, scapular stabilization and neuromuscular control

Shoulder Impingement

At the beginning of the academic year (September), a tennis player seeks out the athletic training staff, complaining of pain in her shoulder. She has been having trouble with her right shoulder for about 2 years. She went to physical therapy over the summer for shoulder impingement, but there has been no change in her pain or function.

8) Is there any other information you need from this athlete to initiate your evaluation?
   - History: when does her shoulder hurt, and what does it feel like?

9) She reports that overhead activities like serving, volleying, and resting with her arms above her head produce pain and soreness. Her shoulder feels like a constant ache, with some sharp stabs of pain. What is your next step in evaluation?
   - Observation
   - Palpation

10) She presents with her shoulders slightly rolled forward. What causes the glenohumeral joint to move anteriorly?
   - Protracted scapulae from:
     - weak: rhomboids, serratus anterior, low and middle trapezius
     - tight: pectoralis major and minor, levator scapula, sternocleidomastoid, and upper trapezius

11) Palpation produces pain anteriorly in the bicipital groove and along the posterior capsule. How do you continue your evaluation?
   - ROM
   - Strength testing
   - Special tests

12) ROM is WNL with pain at the top ranges of flexion and abduction. All strength is 5/5. Her right shoulder has 1 degree laxity compared to her left. Apley's, Empty can, Hawkins, O'Brien's, Speed's, Neer's are all positive. What pathology do you suspect?
   - Impingement of the supraspinatus and/or long head of the biceps

13) Are there any other conditions that need to be eliminated as causes of her pain to ensure appropriate treatment and care?
   - SLAP lesion

14) How do you manage this situation?
   - Physician referral, MRI

THE ELBOW AND FOREARM

Brachialis Strain

In January, 10 days into baseball practice, an outfielder approaches you complaining of pain around his biceps. He says he has been sore from the 3 hour practices, and it just seems to be getting worse, so he thought he would talk to you.

8) How do you initiate your evaluation? Are there any specific questions you would ask this athlete?
   - History: previous arm injuries, current throwing/playing/lifting habits, location of the pain, type of pain, when it hurts

9) He indicates that every year at the beginning of the season, his arm is sore for the first week, but he has never been "injured". He has just been participating in team practices which consist of a 3 hour practice and weights 3 days a week. His arm hurts around his biceps, but it hurts deep, not over the top of his biceps. It aches, and sometimes is sharper when he warms up or tries to throw hard. He feels it the most when he throws, but is still aware of an ache in his arm throughout the day. What is your next step in evaluation?
   - Observation: of the arm and throwing mechanics
   - Palpation

10) Observation reveals nothing significant. His throwing mechanics are good. Palpation reveals that neither the biceps muscle belly, nor the biceps tendons are TTP. However, he is TTP posterior to the biceps, along the distal one half of the humerus. Firmness is noted. How do you continue your evaluation?
   - ROM
   - Strength Testing

11) His ROM is full. He has full strength in his shoulder. He has full strength in elbow flexion and extension. However, he is 3/5 with elbow flexion in pronation. Based on your findings, what type of pathology do you suspect?
   - Muscle strain

12) How do you differentiate the pathology given in #4?
   - Pain with active contraction and passive stretch the opposite direction

13) Pain is also noted with passive elbow and shoulder extension in supination. What pathology do you suspect?
   - Brachialis strain 1-degree

14) How do you manage this pathology?
   - Reduce the quantity and intensity of throwing activities
   - Heat pre activity

- Ice post activity
- Proper warm-up and stretching
- Possible course of anti-inflammatory medications
- Possible anti-inflammatory ultrasound

Median Nerve Neuritis

(This scenario may require unconventional thinking.)

A wrestler enters the athletic training room stating that his arm "feels funny". He has episodes where he cannot grip anything and his arm sometimes tingles. He does not remember when it started. It has been gradually getting more constant and severe.

2) How do you initiate your evaluation?
   - Complete his history: location of symptoms, what exacerbates his symptoms, any previous arm injuries
   - Observation of his arm, hand and posture

2) He has had no previous arm injuries. He thinks he has only had problems from his elbow down. He is most uncomfortable during the second half of wrestling practice and while typing a paper or taking notes in class. Observation reveals nothing significant. Arms are bilateral in size; and his posture, while not perfect, does not have any major flaws. What is your next step in evaluation?
   - Palpation
   - ROM
   - Strength testing

3) He has full ROM, however he has tingling with end-range elbow extension. His grip strength is diminished when compared bilaterally. Gripping also produces a tingle. With manual muscle testing he is 5/5 with tingling in wrist extension and 4/5 with tingling in wrist flexion. He is 4/5 in pronation. How do you determine the location of his tingling?
   - Sensory testing of his forearm and hand
   - Neck evaluation

6) There were no significant neck findings. However, he tingles in his forearm, palm, thumb, index and middle fingers. Does that indicate any nerve? If so, which one?
   - Median Nerve

7) Would you perform any palpations on this athlete? Why or why not?
   - Can palpate muscle groups to determine quality of muscle tone and tenderness

6) Palpation of the pronator teres recreates his tingle, only to a lesser degree. Could this indicate anything?
   - Entrapment from the pronator teres

Olecranon Bursitis

During a basketball game, a post players goes going up for a rebound. He loses his balance and falls to the floor, hitting his elbow. After a second, he gets up and continues to play, after flexing and extending his elbow a few times. At half time he approaches you and just shows you his elbow. His elbow looks grossly deformed. He looks like he grew a golf ball off the point of his elbow.

2) What is your first course of action?
   - History of any previous injury or other medical condition
   - Palpation to rule out any gross deformity

8) He has no previous elbow injuries or medical conditions. There are no separations in the long bones of his upper arm and forearm. The tip of his elbow feels firm, but squishy. What is your next step in evaluation?
   - ROM

9) He has full elbow extension. Flexion is limited due to a "tight" feeling, but not from pain. How do you continue your evaluation?
   - Neurologic exam

10) He has full myotome and dermatome sensation and function. Are there any tests you would perform?
   - Pinch the skin to note the thickness of the pinch

11) Pinching the tip of the elbow reveals a thicker segment than the contra-lateral side. What pathology do you suspect?
   - Olecranon bursitis

12) Can he return to the game?
   - Yes

13) Are there any precautions that need to be taken?
   - Elbow should be padded to help protect the bursa against further contact

Olecranon Stress Fracture

One day in the middle of the season, a baseball player enters the athletic training room complaining of "knife like pain in his elbow". He has been hurting for a few weeks.

13) How do you initiate your evaluation?
    - History

14) He reports playing shortstop and pitcher. He does not have a history of arm injuries, just basic muscular soreness that he treats with ice. His pain is on the posterior aspect of the elbow, and deeper inside where he cannot touch. Is there any other subjective information that you would like to know? If so, what?
    - Yes
    - How does he throw, side arm, etc.?
    - Has he changed anything in his workout routine recently?

15) He reports when he plays shortstop he throws side arm, and when he pitches he throws mostly sliders. The only difference with his current workout schedule has been his quantity of lifting. He has been trying to bulk up to try and be drafted this season. He has put on 20 pounds since last season. What other information do you need to know about his pain?
    - When exactly does he feel it?
    - Does it hurt during ADL's?
    - Can he reproduce it or touch it?
    - What quality does it take?
    - How long does it last?

16) He reports that only two things make it hurt: after the release when pitching and on short, quick throws from short. It does not hurt during the day. It is a quick, intense, stabbing pain that subsides after its initial burst. Where does your evaluation take you next?
    - Observation

17) Observation reveals swelling on the posterior aspect of the elbow, immediately distal to the joint line. What is your next step in evaluation?
    - Palpation

18) He is TTP over his anconeus. What are the attachment sites for the anconeus and what is its action?
    - Origin - posterior aspect lateral epicondyle
    - Insertion – lateral border olecranon process
    - Action – elbow extension, ulnar stabilization during pronation and supination

19) How do you continue your evaluation?
    - ROM
    - Strength testing

20) ROM is full. However, with RROM there is pain with elbow extension and pronation. Is your evaluation over? If not, how do you conclude your evaluation?
    - Special tests

21) All special tests are negative. What injury do you suspect and what is your course of action?
    - Anconeus muscle strain
    - Conservative treatment (US, stretching, strengthening, ice post practice, anti-inflammatories)
    - Continued participation

22) After a week of conservative treatment, there has been no change. Do you change your course of action? If so, how?
    - Yes
    - Restrict throwing activities
    - Consider physician consult

23) Physician consult concurs that the athlete has a soft tissue injury. He treats with a cortisone injection. Can the athlete return immediately? If not, why and when can he return?
    - No
    - He needs to not participate for at least 48 hours after the cortisone injection for the medication to be effective. Then he may return to throwing on a restricted basis.

24) The athlete has relief from his symptoms for two weeks, after which all symptoms return. When his symptoms return, his pain is more intense. What do you suspect and how would you confirm your suspicions?
    - Stress fracture
    - Radiographic imaging.

In this case, the athlete suffered from a spiral stress fracture of the olecranon.

Osteochondritis Dissecans of the elbow

During a high school junior varsity baseball game, while base-running, the short-stop slid head first into second base. After the game, he complains of an achy pain in his elbow.

2) How do you initiate your evaluation?
   - History of exactly what happened and any previous elbow injuries

2) He does not have any previous elbow injuries. He says he slid into the bag with his arms straight. He hit the side of the bag with the base of his palms. He immediately felt some pain in his elbow, he assumed from the impact. Now it aches. How do you continue your evaluation?
   - Palpation

3) Palpation of the elbow and surrounding structures is negative. What are your next steps in evaluation?
   - ROM
   - Strength testing

4) ROM is full, but terminal extension causes some discomfort. Elbow strength is full and non-painful. What is your next evaluative step?
   - Special tests

5) Varus and Valgus testing are negative. Terminal extension bounce elicits some discomfort. Do you suspect any pathology?
   - No
   - Maybe some joint irritation from an axial load while sliding

6) How do you manage this situation?
   - Talk to his parents about his complaints and your findings. Talk to them about their options. They may want to see their physician to verify your findings.

7) His parents are appreciative of your efforts and candor. They decide to see their physician to be safe. The next week, the athlete returns to the athletic training room with a letter saying x-rays were negative, and the physician thinks the joint was just irritated from the axial load. He placed no restrictions on the athlete, who says he feels okay. He returns to play. One month later, the athlete returns to you complaining of pain "in" his elbow. He says he cannot touch it, but the closest he can get is over the front of his elbow joint. He says sometimes his elbow catches on him when he bends it. What is your next course of action?
   - Re-evaluate the athlete

8) What is your first step?
   - Palpation

9) You cannot replicate his pain with palpation, but he is apprehensive when you palpate his anterior elbow. What are your next steps in evaluation?
   - ROM
   - Strength testing

10) ROM testing is limited in full elbow flexion terminal extension, and supination. A catching is felt both with passive and active flexion and extension. What is your next step in evaluation?
   - Special tests

11) Varus and Valgus testing are negative. Terminal extension bounce creates some discomfort. What pathology do you suspect?
   - Osteochondritis dissecans

12) How do you manage the situation?
   - Advise the athlete to return to his physician for re-evaluation and x-rays

Radial Nerve Neuritis

A baseball pitcher approaches you during practice. He tells you about this "weird" sensation he has in his elbow. He has noticed it for the last 2 days. He likens it to nerve pain that he has previously had in his ulnar nerve, only now the sensation is on the "other" side of his elbow. (He indicates the lateral epicondyle and extensor attachment.) He can palpate the site of his discomfort, but to him it is in a "weird place".

9) Is the athlete's history complete? Are there any other questions that should be answered?
   - How would he classify the sensation he feels?
   - When does he feel it?
   - Where does he feel it?
   - Is it isolated to one spot?

10) He indicates that the sensation is not painful, "just weird; and it feels like a nerve pain". He feels it when he throws. It starts where he indicated, but it shoots down his forearm into the back of his thumb. Is this information sufficient? If not, what would make it complete?
   - When in the throwing motion does he feel it?

11) He practices his throwing motion and indicates that he starts to feel it just before release, when he is trying to snap the ball off. How do you continue your evaluation?
   - Observe where the athlete indicates his pain is located
   - Consultation with a throwing coach regarding his mechanics
   - Palpate the structure to determine if you can replicate his symptoms
   - Try to determine what structure you are touching

12) Coach agrees that his mechanics are good and nothing has been altered. He keeps his elbow up during the acceleration phase. You are able to replicate the athlete's complaint. His area of tenderness is between the olecranon and the lateral epicondyle. His pain is posterior to the lateral epicondyle. You can snap over a rope-like structure. He indicates that snapping as a replication of his symptoms. Palpation of his extensor group reveals increased tone with crepitation. What structure(s) could be the cause of his pain?
   - Radial Nerve
   - Origin of the radial collateral ligament
   - Anconeus origin

13) What is your next step(s) in evaluation?
   - ROM
   - Strength testing

14) His elbow range of motion is full and non-painful. His wrist flexion produces mild pain in the extensor group (when the elbow is straight). Wrist extension is full and non-painful. Strength is full in every muscle group. Is there a next step to your evaluation? If so, what would you do, why? What injuries do you suspct?
    - Special tests to verify the structural integrity of his elbow
    - Radial nerve inflammation
    - Tight wrist extensors

15) Varus and valgus testing of the elbow is negative. Tinel's is negative. What pathology do you suspect?
    - Irritation of the radial nerve from tightness in the extensor group

16) What would be your rehabilitation goals for this athlete?
    - Calm the irritation to the nerve
    - Warm-up and stretch the extensor group
    - Loosen up bound tissue restrictions in the extensor group

Radial Stress Fracture

Early in the softball season, a pitcher enters the athletic training room complaining of pain in her dominant forearm. The pain has come on gradually. She does not remember when she first felt it or the possible cause. He forearm hurts off and on throughout the day and consistently during activity. She has not been able to determine a pattern for her pain.

2) Is your history complete? If not, what is needed for completion?
   - Any previous forearm or elbow injuries?

3) She has never before injured her elbow or forearm. How do you initiate your evaluation?
   - Observation and Palpation

8) Observation does not reveal any significant findings. Palpation reveals tenderness along the mid-shaft of the radius, proximal to the insertion of the brachioradialis. What are your next steps in evaluation, and are you looking for any specific signs or symptoms?
   - ROM
   - Strength testing
   - Deficits in ROM or strength

9) ROM is full, as is strength. However, there is pain with resisted pronation, elbow flexion and wrist flexion. There is slight discomfort with elbow and wrist extension. Are there any special tests that should be performed on this athlete? If so, what? If not, why?
   - No
   - There is no reason to suspect a pathology involving either the elbow or wrist. There are no special tests that apply to this injury presentation.

10) What pathology do you suspect based on your findings?
   - Strain/over-use of the brachioradialis

11) How would you manage this pathology?
   - Conservative treatment on the flexor/pronator group, with special attention on the brachioradialis: heat, ultrasound as needed, stretching, strengthening, STM

12) Initially, a compression wrap on the forearm helped reduce symptoms. Rehabilitation on the pronators, brachialis and brachioradialis showed an increase in strength, and a gradual reduction in symptoms. However, as the season

progressed, her pain became more constant, and difficult to manage. What is your next course of action? Why?

- Physician referral for x-rays to rule out a stress fracture

In this case, she sustained a mid-shaft radial stress fracture.

Ulnar Collateral Sprain

The softball team returns from a tournament where they traveled without an athletic trainer. One of the outfielders injured her elbow while diving for a ball. She was evaluated by an athletic trainer at the tournament, but does not remember what she was told. She is now two days post injury. She has been in unrelenting pain and splints her arm to her body.

8) How do you initiate your evaluation?
   - Convince her to relax so that you can look at her elbow
   - Take her history

9) She reports that she has never injured her arm before. In fact, she has never been injured in her athletic career. She does not want to remove her arm from her side, but you convince her to sit down on a stool with her arm out on the table so that you can see her elbow, but still have it protected. She presents with moderate swelling and severe ecchymosis. What are you going to pursue next with your evaluation and what injury do you suspect?
   - Palpation
   - Fracture or sprain

10) Palpation is counterproductive as everything hurts her. What do you try next in evaluation?
   - ROM
   - Strength testing

11) She is unwilling to move her arm, so AROM and strength are immeasurable. PROM reveals a range of 30-90 degrees. What is your next step in evaluation?
   - Special tests

12) Stress testing is nearly impossible due to the athlete's range and pain. Varus stress testing at 30 degrees is negative, but you cannot get the athlete to zero degrees. Valgus stress test at 30 degrees produces significant gapping with a boggy end-point and considerable pain, after which the athlete does not want you touching her anymore. What is your impression of the injury?
   - 2^{nd} or 3^{rd} degree ulnar collateral sprain with possible avulsion fracture

13) How do you rule out your suspicions?
   - Physician referral and x-rays
   - May need to treat for swelling and refer after swelling subsides

14) What do you do to make the athlete more comfortable?
   - Compression sock

- Immobilization in a sling
- Advise anti-inflammatory regimen if athlete is not a minor

THE WRIST AND HAND

DeQuervain's Syndrome

During the fall, a tennis player enters the athletic training room complaining of pain in her wrist.

9) What is your first step in evaluation?
   - A complete history

10) She has never hurt her wrist before. She noticed her wrist pain a couple weeks ago, but it was not that bad, so she ignored it, thinking it would go away. Instead of going away though, it got worse. Her wrist now hurts "all the time". The only thing different she has done is change her grip on her racquet. What is your next step in evaluation and what type of pathology do you suspect she might have sustained?
   - Observation and palpation
   - Muscular strain, over-use or tendonitis

11) Observation reveals mild swelling over the radial aspect of her wrist. She is TTP over the radial styloid and the extensor pollicis brevis and abductor pollicis longus tendons. Crepitus is felt. There is no tenderness over her lateral or medial epicondyles or flexor/pronator or extensor origins or muscle bellies. What pathology do you suspect?
   - DeQuervain's Syndrome

12) What are your next steps in evaluation?
   - ROM
   - Strength Testing

13) Wrist and thumb ROM are full. Pain is noted in the following directions: active radial and ulnar deviation, passive ulnar deviation, active and passive thumb flexion and adduction. Strength is full, but painful. What one special test would you perform in this evaluation?
   - Finkelstein's test

14) Regarding the test given in #5, is this test conclusive?
   - No

15) What pathology do you suspect? Is it the same or different from the pathology listed in #3?
   - DeQuervain's Syndrome
   - The same

16) Describe the suspected pathology.

- Tenosynovitis of the extensor pollicis brevis and abductor pollicis longus tendons
- The tendons are encased in a fibrous sheath with a synovial lining. Repetitive stress, particularly radial deviation, can cause inflammation, which can create a thickening and narrowing of the tendon sheath.

Hamate Fracture

After striking out at his at bat during a game, a baseball player approaches you, stating that he felt a "pop" in his wrist on his last swing. He was unable to carry the bat back to the dug-out with that hand.

7) Is there any other information that would be useful in your evaluation?
   - Which hand is it?
   - What hand does he bat?
   - Type of pain
   - History of hand injuries

8) He has no history of hand injuries. He says the pain is sharp and constant, but worsens when he tries to use his hand. He is right handed, and bats right, but it is his left hand that hurts. Is this information significant to you at this point and why?
   - Yes
   - His left hand is next to the knob of the bat when batting right handed. While swinging, the hamate is forced into a compressed position between the hand and the bat.

9) What are your next steps in evaluation?
   - Observation
   - Palpation

10) Observation reveals nothing significant. Palpation of the wrist only produces pain over the hamate. There is a bony clunk in the proximal hypothenar eminence. What is the next step in the evaluation process? What do you think the injury is based on the current evaluation?
   - ROM
   - Special tests
   - Hamate fracture
   - Wrist sprain
   - TFCC injury

11) There is pain with active ulnar deviation, making a fist, and pronation. There is moderate discomfort with a tuning fork over the hanate. What pathology do you suspect?
   - Hamate fracture

12) How do you manage the situation?
   - Splint the hand and forearm
   - Physician referral for x-rays

Mallet Finger

During basketball practice, the point guard reached to grab a passed ball, but the ball deflected off the tip of his middle finger. He shows you his finger, which is obviously deformed; and he tries to straighten it, to no avail. His PIP joint is extended while his distal DIP joint is flexed. He complains of pain at the end of his finger.

4) What deformity do you suspect? What is the etiology for the injury you suspect?
   - Mallet finger
   - Forced flexion of the DIP results in an avulsion of the extensor tendon from the distal phalanx

5) How do you evaluate this injury to confirm your suspicions?
   - Hold the middle phalanx and have the athlete attempt to actively extend his DIP joint. Inability to actively extend the DIP indicates an extensor tendon rupture.
   - Refer for x-rays to rule out avulsion fracture

6) What is a common treatment for this injury?
   - Splint the DIP in hyper-extension for 6-8 weeks
   - Splinting is to be worn all the time to allow the tendon the opportunity to heal

Metacarpal Fracture

During basketball practice, an athlete approaches you at the end of a play. She is holding her hand, obviously in pain. She states that she just got hit by a ball and another player. She felt a pop or snapping sound.

6) How do you initiate your evaluation?
   - Observation

7) She is not swollen, but there is an obvious deformity in the 4th MCP joint. It is depressed palmarly compared to her other knuckles. What is your next step in evaluation?
   - Palpation

8) There is a palpable click in the distal metacarpal. What is your next step in evaluation?
   - ROM

9) She is hesitant to move her finger. What are the possible injuries she may have and what is your next course of action?
   - Metacarpal fracture
   - MCP dislocation
   - Splint her hand
   - Refer for x-rays

10) What pathology do you suspect?
   - Metacarpal fracture

In this case, she suffered a spiral fracture of her 4th metacarpal.

Metacarpo-phalangeal Sprain

After a basketball game, the point guard approaches you and asks if you can tell if anything is broken in her hand. You ask her why she thinks she may have broken her hand, and she says she dove for a ball and jammed her finger into the floor and now her hand really hurts.

7) How do you initiate your evaluation and what do you initially think may be the injury?
   - Observation
   - Do not know what may be wrong

8) Her hand is mildly swollen over the distal aspect of her 3-5 metacarpals. What do you evaluate next?
   - Palpation
   - ROM

9) Palpation of the fourth metacarpal and phalanx do not produce pain, and no deformities are felt. Palpation of the fourth MCP joint produces pain. ROM is full, but end-range flexion and extension cause discomfort. What is your impression of the injury – what pathology do you suspect?
   - MCP sprain

10) Is your evaluation complete; if not, what is your next step?
   - No
   - Need to perform special tests

11) Stress tests reveal a non-painful firm end-point on the ulnar side, while the radial side produces pain with an open end-point compared to the contra-lateral side. What pathology do you suspect?
   - Fourth MCP radial collateral sprain

12) Will this athlete be able to continue to participate? If so, will any precautions need to be taken?
   - Yes
   - Finger buddy taping

Scaphoid Fracture

During a baseball game, a base runner dove into second base, arms first. When he stood up he was moving his wrist around a little, but stayed out in the field. A couple plays later, after rounding the bases, he approaches you in the dug-out and states that his wrist has been hurting since that dive into second. He indicates that it hurts at the base of his thumb.

8) How do you initiate your evaluation?
   - Removal of his batting gloves for observation

9) He is symmetrical bilaterally. What is your next step in evaluation?
   - Palpation

10) He is tender in his anatomic snuff box. What are the anatomical barriers of the snuff box?
   - Tendons of the: Extensor Pollicis Longus, Extensor Pollicis Brevis and Abductor Pollicis Longus

11) Why is the anatomic snuff box significant?
   - The scaphoid is the "floor" of the snuff box. Palpation within those tendons isolates the scaphoid from the other carpal bones.

12) How do you continue your evaluation?
   - ROM
   - Strength testing

13) He has pain with active wrist extension, especially at the end-range. He is unable to maintain that position with any resistance. He also has pain with radial deviation, both passive and active, as well as passive wrist flexion and extension. He has a diminished grip. What pathology do you suspect?
   - Scaphoid fracture

14) Why is the management of this pathology important?
   - The scaphoid has a poor blood supply, thus healing is poor. This condition must be treated immediately to ensure appropriate treatment and healing.

ILLNESS

Common Cold

One day, an athlete enters the athletic training room before practice, asking for drugs. She explains that she is sick, and asks if you could give her anything for her cold. She wants to feel better for practice.

2) How do you handle the situation?
   - History: ask her about her symptoms, when they started, what they are

14) She started to feel sick yesterday. Her head hurts, she is tired, her throat hurts, and her nose is congested. What other questions would be important to ask? Why would these questions be important?
   - Neck pain, coughing, blood in saliva, diarrhea, vomiting.
   - These conditions could indicate a more serious condition such as meningitis, toxic shock syndrome, food poisoning, etc.

15) She does not have any other symptoms. If she were a high school student, would you give her anything? Why or why not?
   - No, she is a minor and it is illegal for you to give her medication.

16) She is actually a collegiate athlete. Would you give her any medications? Why or why not?
   - Depends on your athletic training room drug dispensation policies.
   - You need to consider if you stock medications or not. If you do, what type do you stock? Do you medicate ill athletes, or do you only stock anti-inflammatories?

17) Assuming that you do offer her medications, what type would you offer her?
   - Decongestant
   - Acetaminophen
   - Throat lozenges
   - Cold tablet (Alka Seltzer Cold)
   - All depending on your supplies

18) Should this athlete participate in practice today? Why or why not?
   - It is your judgment call, based on how conservative you want to be.
   - If the athlete wants to practice, and feels she can, you can modify what she does.
   - Or you can be conservative and allow her body time to rest and recover faster.

19) Today is a lifting day. Should she participate in lifting after practice?
   - Probably not; her body is fatigued from fighting off an illness. She would be more apt to injure herself in her weakened condition.

- Lifting would also use a lot of energy that could be beneficial to her body fighting her illness.

20) The next day, she comes to you before practice again for medication. She looks pale and weak, and her eyes look glazed. Do you medicate her today?
    - Inquire about her symptoms today before making any decisions

21) She has been either really hot or cold today. Her body has been very achy all day. She has not been hungry, nor has she been drinking fluids. What illness do you suspect?
    - Flu, or other illnesses discussed

22) What is your next course of action?
    - Take her temperature

23) Your suspicions are correct. Her temperature is 101. Do you allow her to practice today? Why or why not?
    - No
    - It is dangerous for her to participate when she is running a fever. She needs to rest.

24) How do you manage the situation?
    - Refer to a physician for diagnosis and treatment if necessary

25) When you tell her coach that this athlete is not practicing, she becomes irate. She tells you that it is just a cold. She used to practice through colds, so her athlete can as well. You are just trying to hurt the team by holding her athlete out of practice. How do you handle the situation?
    - Explain to the coach the dangers of practicing when ill.
    - Explain that if her athlete rests, she will recover sooner, faster than if she participated through her illness.
    - If she continued to participate, her illness could worsen into bronchitis, pneumonia, or mono, which could ruin the rest of her season. Also, if she participated when ill, she could infect the whole team as well.
    - You are sorry if she is taking this decision personally, but it is being made for the well being of the sick athlete, as well as the rest of the team.
    - You are referring the athlete to a physician to verify that she does not have a more serious condition that would require medical attention.

Mononucleosis

During the basketball pre-season, one of the athletes looks sluggish on the court. She is the last one to finish running suicides, when she is usually one of the first across the line. Coach spends a lot of time yelling at her because she is so sluggish.

12) Do you approach the athlete and inquire what is wrong during practice?
    - Depends upon your relationship with the athlete and your normal standard of care.
    - You might approach the athlete and inquire how she is feeling, or tell her to come see you after practice.
    - If you are at practice, you know you are available if the athletes or the coaches think you are necessary. Maybe you do not approach the athlete until she approaches you.

13) She approaches you after practice looking tired. She tells you she feels tired and has a head-ache. Her head-ache gradually came on during the day, but now it is bad. What do you tell the athlete?
    - Inquire about a possible head injury
    - Advise her to drink a lot of water or Gatorade to make sure she is hydrated
    - Eat a good dinner
    - Go to bed early

14) She verifies that she has not hit her head on anything. She comes to you the next day and feels a little better. She is hydrated, but she did not sleep well. What do you tell her?
    - Ask her how she feels about her ability to practice

15) She assures you she will be fine. She participates in practice. The week passes with her feeling lethargic, but she thinks it is because she has trouble sleeping. She is insistent that she is okay. The next week she comes to you asking for a throat lozenge because her throat hurts. What is your course of action?
    - Evaluate her neck for swollen glands, take her temperature

16) She does have slightly swollen glands, but she has no temperature. Are there any conditions you should be worried about at this time?
    - Mononucleosis
    - Flu
    - Common cold
    - Strep throat

17) What do you tell the athlete?

- She might be coming down with an illness. Advise her that she should sit out practice so that she does not infect the team, and so she may recover faster.

18) She does not want to, but she agrees and sits out practice. The next day she tells you she woke up in the middle of the night drenched in sweat. What is your next course of action?
    - Palpate her spleen, checking for enlargement
    - Send her to the student health center for physician evaluation

19) What condition do you suspect? Why?
    - Mononucleosis
    - Mono's early symptoms are fatigue, head-ache, myalgia, loss of appetite (which this athlete did not have), which turn into fever, swollen glands, sore throat, and night sweats

20) Do the symptoms listed in #8 always manifest themselves with the suspected condition?
    - No

21) The athlete returns from the student health center and reports that labs were taken, and she is awaiting results. She wants to practice. Do you let her? Why?
    - No
    - If she does have something infectious, she could infect the team by practicing with them.
    - If she has mono, playing with an enlarged spleen could be life threatening if something happens and her spleen ruptures.

22) When the labs results return, they indicate that she has mononucleosis. How long is this athlete out from participation?
    - Until her symptoms subside and her spleen is not enlarged.

SKIN CONDITIONS

Ringworm

During wrestling skin checks, a red circle approximately the size of a quarter is found over an athlete's rib cage. Around the red circle is flakey white dead skin. There are no pustules or other incongruities in the skin.

5) What skin condition do you suspect?
   - Tinea Corpus or Ring worm

6) How do you differentiate between possible skin conditions?
   - Consult a physician

7) Can this athlete participate?
   - Yes, with the area covered.

8) What is the treatment for this condition?
   - Antifungal cream, lotion, etc.

PREVENTION

Blood Sugar Imbalance

A cross country runner (freshman) enters the athletic training room one afternoon, looking like she is only partially awake. She approaches you, asking to talk. She tells you she is always tired and never feels like she has any energy.

7) What do you initially say to this athlete?
   - More history:
     - How long has she been feeling this way?
     - Explain symptoms

8) She indicates that she has been feeling this tired for a couple weeks. At first she just thought she was sleep deprived. But now, she has trouble staying awake, but she does not sleep well. When she wakes up, she is famished, but craves candy. She has a hard time concentrating, or participating effectively throughout practice. What pathology do you suspect in this athlete?
   - Hyperglycemia
   - Hypoglycemia
   - Adrenal gland insufficiency
   - Anemia
   - Vitamin Insufficiency

9) What further questions do you ask this athlete?
   - Describe diet
   - Head-aches?

10) Yes, she gets head-aches. They are constantly there, but she gets sharp shooting pain in her left eye, which eventually leads her to take a nap. In the morning she eats a bagel, orange, and a powerbar. At lunch she eats a peanut butter and jelly sandwich with chips. For dinner she usually eats pasta. She also states that about 30 minutes after she eats, she gets really tired. She snacks on candy during the day. She has had difficulty being away from home where her mom cooked for her, so she eats what is easy to prepare. Do you see any problems with her diet?
   - Yes; it is full of carbohydrates, but minimal protein. She needs to eat a more balanced meal with more protein and vegetables.

11) Based upon your findings, have your responses to #2 changed?
   - No

12) How do you confirm your suspicions or manage this athlete?
   - Referral to the health center for physician evaluation and blood work
   - Nutrition counseling

Eating Disorder

During entrance physicals, a collegiate cross-country runner is diagnosed with a stress fracture of L4. She indicates that she has never had a back injury or trauma. She is 4'10" and weighs 90 pounds.

8) Do you have any reason to suspect an eating disorder in this athlete?
   - Maybe
   - She is a new athlete, so you do not know any information about her.
   - Lumbar spine stress fractures are not common injuries, especially in a petite young adult.

9) How do you manage the situation?
   - Monitor her behavior and condition to gain more knowledge
   - Refrain from sneaky behavior to "spy" on the athlete

10) She has difficultly throughout her rehabilitation with refraining from exercise. She constantly works out in the pool, stair-stepper and bike. One day a teammate confides in you that he saw her running on the road that morning. What do you do when you see the athlete that afternoon?
   - Inform her you know she is running when she is restricted to because of her back. Inquire why she is running.

11) She responds that she "has to". She does not know what to do with herself if she cannot run and work-out. She wanted to see if it would hurt to run. She tells you it did not hurt. What do you tell this athlete?
   - In order for her to heal, she must refrain from impact activities that will exacerbate her condition and prevent healing.
   - She also needs to make sure that she is taking care of her body. She needs to be eating good, healthy food, especially dark green leafy vegetables to give her body the nutrients it needs to heal.

12) When you advise her about eating nutritious food to allow her body to heal itself, she seems anxious and uncomfortable. You notice fine, blond, baby hair over her cheeks. What is your current opinion of this athlete?
   - That she might have an eating disorder

13) How do you act on your suspicions? Do you ignore them? Do you confront the athlete?
   - Tell her you are concerned about her eating habits. You know it is hard to have good eating habits while in college. You think she should talk to a nutritionist.

14) She seems nervous about the suggestion and insists she is okay. But she agrees to go. Will she benefit from only speaking with a nutritionist? Why?
    - No
    - The cause of her eating disorder needs to be determined and addressed to improve her situation.

Heat Illness

At high school football practice during September, your town is experiencing a heat wave. It is about 100-degrees outside with high humidity levels. You have supplied the team with ice towels as well as coolers of ice water. A running back approaches you complaining of calve cramps.

9) How do you handle the situation?
   - Help him stretch his calves to stop the cramping
   - Give him a water bottle to help hydrate to prevent cramping

10) He comes off the field about 30 minutes later complaining of dizziness. What is your first course of action?
   - Remove his pads and evaluate him for heat illness

11) Do you have reason to suspect any heat illness?
   - Yes
   - High school athletes are poor at hydration
   - Cramps are a sign of heat illness
   - Dizziness is a sign of heat exhaustion

12) How do you continue your management of the situation?
   - If possible, remove him to a shady area.
   - Check his skin for sweating and color
   - Take his temperature
   - Take his pulse
   - Monitor his breathing

13) His skin is pale and wet. His pulse is 90bpm and he is breathing rapidly. His temperature is 101-degrees. What do you suspect based upon your findings?
   - Heat exhaustion

14) How do you manage the situation?
   - Have him drink fluids: water and Gatorade, or other sports replacement drink) if possible.
   - Remove all excess layers: under-shirts, shoes and socks

15) Do you leave this athlete to attend to the sidelines? Why?
   - No
   - His condition needs to be monitored. His status could deteriorate and you need to be with him.

16) If his symptoms had been: flushed, dry, hot skin, shallow breathing, rapid pulse, and a temperature of 105-degrees, how would you have managed the situation?
    - Call 911 for transport and IV re-hydration

Hypothyroidism

A women's field hockey player enters the athletic training room wanting to talk to you. She indicates that she has been feeling "weird" and she thought you might be able to help her.

8) What do you need to know from this athlete?
   - What has she been feeling?

9) She has been feeling "weird" things for a few weeks, so she made a list because she did not know how, or if, they were related. It all started a few weeks ago. Since it started, she has not felt herself. How do you respond to this athlete?
   - Can you see the list?

10) The list includes: constantly cold, gaining weight but not hungry, dry skin (no matter how much lotion she uses), and excessive hair loss on hairbrush. She says she has not had any energy lately. She does not want to spend time with her friends, and going to class is a struggle. She thinks it is a good thing that field hockey is in their off-season, because she does not feel like being physically active. She is scared and does not know what is wrong with her. Do you have any questions for this athlete?
   - Have there been any changes in her routine lately?
   - Is she taking any medication or vitamins?
   - Has she had any emotional trauma lately?

11) Why are these questions important?
   - Affirmative answers may indicate a connection to her symptoms

12) Nothing significant has happened, other than a change in how she feels. Family and friends are fine. She is not taking any vitamins or medications. Do you suspect any conditions at this time? Why?
   - Hypothyroidism
   - All her complaints are symptoms of hypothyroidism

13) What other questions do you need to ask this athlete?
   - Does her family have any medical conditions of which you should be aware?

14) Her dad has high blood pressure, and her mom takes pills every day to regulate hormones, but she does not know for which hormones. What do you tell the athlete?
   - She might have an irregularity in her thyroid gland, which secretes hormones to help regulate her body functioning.

- Advise her that an appointment should be made with a physician for evaluation and blood work.

Testicular Cancer

A men's soccer player enters the athletic training room looking nervous. When you approach him to inquire about what he needs, he anxiously looks around the room at the other athletes, and he does not answer your question.

8) What are your first thoughts regarding this athlete?
   - He may not want other athletes to hear what he has to say.
   - He may not be comfortable talking to you about his concerns.

9) You ask him if he would like to talk in private, or if he would be more comfortable talking to somebody else. He assures you that you are okay, but he would like to talk in private. How do you handle the situation?
   - Depending on your facilities, you may talk in your office, or in a quieter part of the ATR, or need to go outside.

10) Once you are in a quieter location, he still seems nervous. What do you do?
   - Assure the athlete that you are there to help and he can talk to you.

11) He tells you what he has to say is embarrassing. He thinks he has a lump in his scrotum. How do you react?
   - Remain calm, professional and concerned
   - Stick to the facts and be straight forward with your questions

12) How do you continue your questioning?
   - History
     - When did he notice it?
     - How large a lump?
     - Does it hurt?
     - Has he noticed any other unusual symptoms?
     - Did he experience any trauma to his groin?
     - Was there any blood in his urine?
     - Does urination hurt?

13) He just noticed it today, when he was in the locker room. It feels like one testicle is larger than the other by "a bit" but it is difficult to tell how large. His scrotum feels enlarged and pressure is uncomfortable. He has not had any groin trauma, and he does not think there was any blood in his urine. Urination does not hurt. What pathology do you suspect? Why?
   - Testicular cancer
   - Testicular cancer is the leading type of cancer in males between the ages of 15-35
   - Signs and symptoms are

- a lump, irregularity or enlargement of the testicle
- a pulling sensation or felling of unusual heaviness in the scrotum
- a dull ache in the groin or lower abdomen
- pain or discomfort in the testicle or scrotum
- enlargement or tenderness of the breasts

14) What do you tell the athlete regarding your suspicions?

- Do not tell him about your suspicions; there is not need to scare him if you are incorrect.
- Tell him to go to the student health center to have it checked out. Make sure he understands this is not something to ignore. Tell him if he does not get it checked out, it might get worse, which would bad.

Weight loss and dehydration

One of your high school wrestlers comes to you complaining of ringing in his ears. He has a match tomorrow, and is having trouble understanding what is being said to him at practice. He thinks maybe he has an ear infection but he still wants to compete. When you ask him how long his ear has been troubling him, it takes a few moments for him to respond with an answer of a couple days. His demeanor seems lethargic. He is wearing his sweat suit with the hood up, even though it is 80 degrees outside and this practice is banned.

6) Do you think he has an ear infection? Why or why not?
   - He might, but he could be suffering from cutting weight too drastically

7) What other information will you look for to help you draw your conclusions during the observation portion of the evaluation?
   - Cotton mouth
   - "The shakes"
   - Skin hydration and pinch rebound
   - Gaunt look about his face
   - Ear evaluation with a otoscope

8) The otoscope revealed a shiny, translucent tympanic membrane. He indicates that practice has been especially hard for him this last week. He has been trying to cut weight, so he has not been eating or drinking much, even though he has been working out 3-4 times a day. He has felt weak. How will this affect his wrestling ability?
   - A dehydrated wrestler loses strength, especially tensile strength and the ability to mentally focus. A decrease in strength can be a predisposing factor in muscle, tendon and ligament injuries.

9) How do you handle the situation?
   - Explain to the athlete that he does not have an ear infection, but is suffering from dehydration. You understand that losing weight may be a necessary aspect of wrestling, but drastic weight loss is not healthy for the body. The process needs to be gradual, and within the limitations of the athlete's body.

10) Do you talk to the athlete's coach? Why or why not?
   - If possible, you should inform him of your findings and concerns. You want to make sure that he knows what is happening with his athletes. After he is informed, he can take whatever measures he deems appropriate. This could be a good opportunity to discuss appropriate weight loss methods and habits.

ADMINISTRATION

Administrative

A tennis athlete is diagnosed with multidirectional instability in the fall. She is adamant that she does not want surgery. She wants to play this spring. After discussing all options with the orthopaedic surgeon and the athletic training staff, it is decided that she will try a thorough rehabilitation plan to strengthen her for the season. This is her last year of play. Over the winter she participates in a rotator cuff and scapular stabilization strengthening program, with some success. In January, she is able to play, despite her shoulder's spontaneous popping. At the end of the season, the athletic training staff never sees her. The following year, she reappears. To your surprise, she is playing one more year of tennis. She says her shoulder is the same. It pops, but it does not bother her or prohibit her from playing.

7) Are there any steps that should be taken with this athlete at this time?
   - Review her rehabilitation program, and advise the athlete to continue performing her exercises to maintain her shoulder's health

8) You rarely see her during the fall. She occasionally comes into the athletic training room for ice after practice. She never complains about her shoulder. It is always "the same", as she says with a laugh. During the season, however, her shoulder starts to deteriorate. The popping becomes more pronounced and constant. She is unable to remain competitive with matches that go into three sets. She complains to you during matches about her shoulder. How do you manage the situation?
   - Advise her to come see you before practice

9) She never shows up before practice. She also is not consistent about icing her shoulder after practice. Yet she continues to complain when you see her on the court. She complains about other body parts as well and says she wants help. What do you tell her?
   - Make a list of the body parts that need attention and include how much time she is willing to put forth. With this information, you can draft a rehabilitation program for her to address her issues.

10) She never produces a list, and she sometimes comes to see you with 15-20 minutes left before practice, expecting you to "fix" her. How do you handle this situation?
   - Explain to her that she needs to take responsibility for her own healing. She needs to give you the list you requested, and she needs to be willing to consistently participate in her rehabilitation for you to help her.

11) She says she will give you the list, and she will come see you tomorrow. You never see the athlete in the athletic training room for the duration of the season. At the completion of the season, she comes to see you and cries that she just

cannot take it anymore and she wants surgery. How do you respond to this athlete?

- Set up an appointment with your physician

12) You feel she has been irresponsible by not making her shoulder a priority. You want to tell her the school will not cover her surgery. Can you withhold surgery?
    - No; as much as you would like to, she sustained her injury while playing at your institution. She needs to be treated and covered by athletics insurance. You can, however, talk to her about her lack of responsibility in regards to her own

Communication

Three nights before you leave with a team on a road trip to your home town, you find out from one of your athletes that you are no longer going on this trip. That day at their team meeting, the head coach had asked the team if they felt the athletic trainer really needed to go, or if the athletes could be treated by the host athletic trainer instead. You are devastated. You have family in both cities you would be visiting on this trip, and had already made arrangements to see them in your free time. For the last 2 years you have worked with this team, and you have traveled to every away game. You had been told again at the beginning of this season that you would travel on every road trip with the team.

2) How do you handle the situation?
   - Call your coach to ask her about her plans

7) Your coach informs you that she has decided not to take you on the trip. What is your response?
   - You understand that she has the right to make that decision, however you do not appreciate her timing. You had been told that you would travel every road trip with the team, so you had no reason to believe otherwise. Three days notice is inconsiderate to your life and plans.
   - It was not appropriate for her to discuss this decision with the team backing your absence, or for you to find out about it from an athlete.

8) She tells you the decision was not personal. If the team had felt that they needed you, she would have taken you. She wants to make sure that this is not going to affect how you treat the team. What is your response?
   - Advise the coach that you and the coaches have different agenda's and that the athletic trainers cannot be second guessed by athletes that may be emotional and desire to play over health.
   - You are a professional. Your feelings regarding this matter would never affect how you treated the team.

9) When the team gets back from the trip, the coach returns the traveling kit, as well as the traveling kit for the men's team, without an explanation of why she has both kits. She proceeds to question you regarding the contents of their travel kit. You had stocked 2 inch tape and the other athletic training rooms had complained. Did you not use 1 ½ inch tape? You had included tape cutters, but they would also like scissors. Lastly, the team has been sick and they would like drugs in the kit on the next trip. How do you handle this request?
   - You use 2 inch tape. It is the tape that will be sent. If the coaches do not want to deal with what they consider a "taping situation" they can take their own athletic trainer.

- You will include scissors next time, even though the team has never needed them in the past.
- They cannot have any medications without a certified athletic trainer present.
- This present discussion indicates to you a lack of trust on the part of the coaching staff. Your actions have done nothing to deserve such treatment. You do not understand what has prompted the coaches to feel and act in this fashion. If they have concerns about something that has happened in the past, they need to bring it to your attention so that it can be resolved. If that is not the case, they need to treat you with the trust and respect that you deserve.

10) She is angry when she responds that the men's kit had medications. The men are obviously receiving preferential treatment. What do you tell her?
    - You had not packed the men's kit. There should not have been any medications in it, since they had not traveled with an athletic trainer either. You do not know how they got there, but policy is not to send drugs without a certified athletic trainer.

11) When you are preparing the team for practice that day, some of the athletes tell you that they had stood up for you and told the coach that they needed you there to tape them and take care of them. They had missed you over the week-end. Do you take this matter to the coach? Why or why not?
    - At this point, no.
    - You have already expressed your feelings to the coach. She has already displayed her distrust and lack of respect. You are a professional and should conduct yourself in a professional manner.
    - You will deal with the coaching staff professionally, but recognize that you cannot always expect the same from others.

Ethical Issues

One of the women's basketball post players has a finger deformity that requires splinting. The athlete's injury has been discussed and a decision was made, with the medical team and the athlete that she could continue to play as long as her splinted finger was also buddy taped. She practiced with the 4-5 digits of her non-dominant hand taped during the week. During the first half of Friday night's game, the first game since the injury, she comes off the court ripping the tape off her fingers.

10) How do you handle the situation?
    - Approach her to remind her she cannot play without her fingers taped and inquire about the problem

11) You are standing behind the bench, and she is unresponsive as you attempt to get her attention to talk to her. What do you do?
    - Touch her back or shoulder to let her know you are there, and try to get her attention again

12) She starts yelling at you to leave her alone. She cannot play with her fingers taped together. How do you respond?
    - Inform her again that she cannot play without them taped
    - Remind her that this matter had been discussed and decided upon

13) She stands up and starts cussing at you. She tells you that you need to leave her alone, that you need to pay attention to the game, where your attention should be. She tells you to stay "over there" where you belong and stop telling her what to do. What is your response to this athlete?
    - If she will not tape her fingers together, than she is out of the game
    - You approach the coaches and inform them that she is out of the game until she tapes her fingers

14) The coaches back your decision. They inform the athlete to tape her fingers back together. The athlete approaches the coaches to show them that her finger is already taped into her splint. The coaches call you over to inquire if the athlete needs more tape than the already splinted finger. You inform them that her fingers need to also be taped together. They understand. At the beginning of half time, the athlete runs into the athletic training room to get tape, while ignoring you. At the end of half time, the athlete warms up with the team and continues to ignore you. How do you handle the situation?
    - The tape needs to be inspected. Depending on your relationship with these coaches, you can either inform the coaches that the athlete is avoiding and ignoring you and that she cannot play until you approve her finger taping, or

you can explain to the coaches what the taping requires and have them look at it to see if it is sufficient.

15) The coaches force the athlete to come over to you. The athlete belligerently shoves her hand in your face. How do you handle the situation?
    - Inspect her hand and taping to determine if it meets your criteria

16) The tape is adequate. What do you tell the coaches?
    - She can play

17) The next night during warm-ups of a game, you watch this athlete to see if her fingers are taped together since she never came into the athletic training room before the game. They appear to be taped together. However, when she comes out of the game during the second half, you see her fingers are no longer taped together. How do you handle the situation?
    - You can hand her a roll of tape and inform her to tape them together or she is out of the game
    - You could go directly to the coaching staff to inform them that she had removed her finger tape and discuss how to handle the situation
    - However the situation is handled, the wrong thing to do is ignore it

18) She tapes them together. Are there any steps that need to be taken in the future regarding this athlete's attitude?
    - Talk to the coaches about everything that had transpired with the athlete
    - Inform them about the athlete being rude and disrespectful to you during the game Friday night
    - The athlete's actions have shown that she needs to be watched to make sure she is abiding by the guidelines set forth. Therefore you need to coaches to also keep an eye on her so that she does not break the rules every time you turn your back.
    - The athlete needs to be talked to regarding her respect and attitude problems. Your job is to keep her and other athletes safe and healthy, not to take her abuse. There are guidelines, and if she will not adhere to them, she proves she is not trustworthy and she will not be allowed to play.

MODALITIES

Cryotherapy

During volleyball practice, you watch a player dive for a ball. She is slow to stand and is staring at her hand and moving it slowly. She approaches you immediately. She complains of pain and inability to make a fist. She says her hand is "tight, like from swelling". You observe a red, visible tumor over her 2nd MCP joint, which is point tender. Her AROM is limited by pain and swelling. PROM is limited by swelling.

7) What modality would be most beneficial for this athlete at this time?
   - Ice

8) Why would you use the modality chosen in #1?
   - For vasoconstriction immediately following an acute injury
   - To decrease pain and muscle spasm
   - To decrease the rate of secondary cell death due to hypoxia and the production of cellular waste

9) What methods of treatment would be appropriate for this athlete, and why?
   - Whirlpool for comfort and to affect the whole hand
   - Ice bag so the athlete can remain in practice and elevate her hand with compression

10) How long should the athlete use the modalities described in question #3?
   - Whirlpool: 10-20 minutes is the guideline; in this case, 10-15 minutes due to the superficial nature of the injury and the hand.
   - Ice bag: 15-30 minutes is the guideline; in this case, 15-20 minutes due to the superficial nature of the hand.

11) What temperature must the skin be in order to obtain therapeutic benefits?
   - 57 degrees for optimal decrease in local blood flow
   - 58 degrees for analgesia

12) What are the physiological effects of the chosen modality on pain?
   - Local decrease in free nerve ending sensitivity
   - Increase in the threshold for nerve firing
   - Slowing of synaptic activity
   - Disruption of the pain-spasm-pain cycle through analgesia

Interferential Current

One of your women's soccer players is one-week post ACL autograft reconstruction. She was home for the first week after surgery, and did not do any therapy other than icing her knee occasionally. She complains of extreme pain and inability to move her leg because of the swelling in her knee. Observation reveals severe swelling in her right knee, with the skin appearing pink and distended. Her skin is warm to touch. Despite swelling and redness, there does not appear to be any signs of infection.

8) What is an autograft reconstruction, and would that have anything to do with her pain and swelling?
   - In an autograft reconstruction, tissue is taken from a site on the patient and used at a different location in the same body
   - Most common ACL autograft involves the patellar tendon, resulting in a compound inflammatory reaction in the knee from the surgery itself, and the harvesting of the graft.

9) What electrical modality would be most beneficial for this athlete at this time?
   - IFC for swelling and pain reduction

10) Why would you choose that electrical modality over others, and what would other modalities do for treatment?
   - Ice would help for pain, but not swelling at this point
   - Heat would be contra-indicated due to the active inflammatory reaction in her knee
   - TENS could help with her pain, but not her swelling
   - Before ultrasound can be considered, the swelling must be removed, and ultrasound does not remove swelling

11) For what purpose would you choose the modality in question #2?
   - To decrease pain and swelling

12) What treatment parameters would you choose to accomplish this goal?
   - Biphasic, (-) polarity , 15 HZ

13) Is the polarity setting on an electrical modality important, and why?
   - Yes
   - (-) is more comfortable
   - Blood has a (-) polarity; therefore because of the magnet theory, the use of (-) polarity electrical stimulation will repel blood edema out of the area.

14) What pad placement pattern would you use for this athlete?
   - Quad-polar

Low Level Laser

A basketball player diagnosed with a navicular stress fracture is in phase I of the rehabilitation process.

2) Would you incorporate Low Level Laser (LLL) into the rehabilitation process?
   - Yes

2) What are the physiological effects of LLL?
   - Increases ATP, DNA and Ca++
   - Increases cell proliferation
   - Increases enzyme production
   - Over-all increases the healing rate 4 times

4) Knowing the effects of LLL, why would it be effective on navicular stress fractures?
   - Navicular stress fractures commonly occur in the middle third of the bone, where compression is the greatest and blood flow is minimal.
   - Navicular stress fractures heal slowly, and sometimes remain non-union. The increased healing properties will offer the navicular a greater opportunity to heal.

4) For what other conditions would LLL be beneficial?
   - Cutaneous wounds and ulcers
   - Neurological disorders
   - Arthritic conditions
   - Post-surgical pain
   - Tendon inflammation
   - TMD
   - Trigger points

6) During what phase(s) of the inflammatory process should this modality be incorporated?
   - Better used earlier in the inflammatory process to have maximal healing results
   - Can be used during phase I and phase II

TENS

You are evaluating a 25 year old UPS employee who is currently on workers compensation for an erector spinae strain from improper lifting. He is 2 days post initial injury. He has been referred to physical therapy by his physician and is on pain medication. Today has been his first time out of bed since the injury. He walks in spinal flexion. He complains of pain and the inability to stand straight up. He cannot find relief from his discomfort. He has mild swelling over his right erector spinae and is point tender on the right side as well. AROM and PROM are limited by pain.

9) Would you use TENS on this patient?
   - Yes

10) What would indicate that TENS could be appropriate for this patient?
   - Reduction of acute pain

11) TENS may be set up many different ways, but regardless of the method used, TENS affects what physical structure?
   - Nerves

12) What theory supports the use of TENS? How does that work?
   - Gate Control Theory: TENS stimulates afferent sensory fibers to elicit production of neurohumneral substances such as endorphins, enkephalins and serotonin

13) What are the protocols for the various methods of TENS?

Parameter	High TENS	Low TENS	Brief-Intense TENS
Intensity	Sensory	Motor	Noxious
Pulse Frequency	60-100 pps	2-4 pps	Variable
Pulse Duration	60-1000 usec	150-250 usec	300-1000 usec
Mode	Modulated	Modulated Burst	Modulated
Tx Duration	As needed	30 min.	15-30 min.
Onset of Relief	<10 min.	20-40 min.	<15 min.

14) Where is electrode placement for TENS?
   - Over the painful sites, dermatomes, myotomes, trigger points, acupuncture points or spinal nerve roots
   - Electrodes may be crossed or uncrossed

15) For this patient, where would you place the electrodes?
   - 4 in a vertical line down his right erector spinae

16) What are the contraindications for TENS?
- Pacemakers
- Over carotid sinuses
- Pregnancy
- Cerebral vascular disorders
- Over the chest in patients with cardiac conditions

Thermotherapy

Two weeks after sustaining an ATF sprain, an athlete has progressed into the second phase of rehabilitation. He complains of pain, weakness and stiffness when walking. He has difficulty with movement, especially when he wakes up in the morning. His gait is non-painful, but he walks with a limp due to stiffness. There is mild localized swelling around the ATF. ROM is almost full in all directions, and strength is 4/5 in all directions.

8) What modality would have the most effect on this athlete at this time?
   - Heat

9) What are the indications for the use of that modality?
   - Muscle spasm
   - Subacute inflammation
   - Trigger points
   - Subacute pain
   - Decreased ROM
   - Hematoma resolution
   - Joint contractures
   - Infection

10) Why would you choose this modality over another?
   - Heat will increase blood flow, resulting in increased circulation to the affected tissues and surrounding area
   - Increased blood flow will help to flush out the swelling that is still present
   - Increased blood flow will also increase tissue elasticity which can aid in the reduction of stiffness
   - Heating prepares the area to be stretched, so ROM could be addressed effectively after heating

11) What treatment parameters would you choose for this modality?
   - Whirlpool if available, to warm the entire area easily
   - If not available, a hot pack can be used as well

12) What is the appropriate temperature for the desired method in question #4?
   - 105-110 degrees

13) What is the treatment time?
   - 10-20 minutes

14) What are the contraindications for this method?
   - Acute conditions that would be irritated by water turbulence
   - Fever

- Patients requiring postural support
- Skin conditions

Ultrasound

A 19 year old men's basketball player has been diagnosed with patellar tendonitis. He has had this condition for approximately 2 months. He currently complains of pain inferior to his patella during and after practice, as well as walking up and down stairs. He is point tender at the inferior pole of the patella.

2) Would you perform ultrasound on this athlete? Why or why not?
   - Yes, to establish an optimal healing environment

2) What is your therapeutic purpose of ultrasound in this case?
   - Non-thermal to decrease sub-acute and chronic inflammation and increase cell permeability and collagen synthesis

3) What settings would be appropriate for this injury?
   - 3Mhz, 100% duty cycle, .5 w/cm2 intensity for 4 minutes (for 1 degree)
   - 3Mhz, 100% duty cycle, .5 w/cm2 intensity for 7 minutes (for 2 degrees)
   - 3Mhz, 100% duty cycle, 1.0 w/cm2 intensity for 4 minutes (for 2 degrees)

7) What size ultrasound head would you use for this body part?
   - Smallest one available at your location

8) How big of a treatment area do you want to target?
   - Only twice the size of the sound head selected

9) What coupling agent should be used?
   - Gel or gel pad

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