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Well, Baltimore here we come, for the hospitality of District 3 and our Annual Symposium which I am sure will be a great experience for us all.

Please Note

The states in each district have been added for your information and quick reference, along with the telephone numbers of the Executive Director, President, District Directors, and District Secretaries on the main masthead of the Journal.

Moved

Please be advised that in the future contact Barbara Manning, Business Manager of the Journal, and Debi Hilton, Circulation Manager, at the following address: P.O. Box 600, Winterville, NC 28590, telephone 919/355-5144.

Thanks

I would like to thank Mr. Jerry Rhea for the fine job as President of this organization for the past two years. He has (along with many others) helped the NATA achieve greater heights of respectability and professionalism. Much success for the future, Jerry.

Closing

Looking forward to seeing and visiting with many of my peers. And please if you have questions, complaints or compliments, I welcome them all. See you in Baltimore.
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Dear Members:

It seems like a fast two years. Many things have happened in NATA during the two years of my term, yet some things remain unresolved. Our Public Relations campaign has paid dividends in producing public awareness. The amount of publicity we had through printed media as well as radio and television was far more than I had dreamed.

We have made every effort to make America aware of the level of care in the high school as it is today. Our injury survey as conducted by John Powell has been so important in documenting our message with facts. We must continue to press for the care of the secondary school athlete and provide that means through education, guidance, and opportunity. Someday most of our schools will be staffed with full-time certified athletic trainers; until that becomes reality, we must provide options that are better than are presently in place.

Your Board of Directors has spent a great deal of time looking at options to relocate our national office and establishing our own Hall of Fame. It has been two years since the search and discussions began, and we still don’t have a site. We need to select that site and get on with it. Too many important decisions get stalled while we wait on a decision to move.

The “Athletic Training in the 1990’s has been an exciting presentation in those districts where it has been presented. The exchange between the panel and the audience has been rewarding and has provided your leadership a keener insight into what problems and concerns you, as individual members, have.

Thanks to all of you for allowing me to serve. Especially thanks to those Board members, those committee members, Otho, Mary, and the rest of the Greenville office who support us with their work every day. Mark Smaha will be a great asset to our organization. His term will see many important changes that will allow NATA to continue to be the leader in the care of the athlete as it always has been.

Thanks for this experience.

Jerry Rhea
Ankle Fractures: Common Mechanisms, Classifications, Complications

Charles T. Mehlman, ATC

Abstract

Athletes are notorious ankle abusers and insult to this important joint may permanently hinder future activity. A clear understanding of common ankle pathology is indispensable to the health care professional who must manage these injuries. Members of a sports medicine staff should be familiar with common ankle fracture mechanisms and classification systems, as well as potential complications. A review of common fracture mechanisms, classifications, and complications is presented.

The ankle may be classified as a ginglymus joint and typically grants its owner fifty degrees of plantarfexion and twenty degrees of dorsiflexion. The terms talocrural and ankle mortise are common synonyms for the ankle joint. The articular surfaces responsible for the uniplanar motion of the ankle are contributed by the tibia, fibula, and talus in the form of the medial malleolus, lateral malleolus, and trochlea tali respectively. Dorsiflexion affords the talocrural joint greater stability as this position engages the wider anterior portion of the trochlea tali between the malleoli. The fibrous capsule of the ankle joint is lined by a synovial membrane which may extend a short distance superiorly between the tibia and fibula. Lateral ligamentous support is provided by the anterior talofibular, calcaneofibular, and posterior talofibular ligaments while the medial side has the benefit of the deltoid ligament and its superficial and deep components. The superficial component is comprised of tibionavicular, tibiocalcaneal, and posterior tibiotalar parts, and the deep component is provided by the anterior tibiotalar parts. Other important structures about the ankle include the anterior and posterior tibiofibular ligaments which contribute to the syndesmotic inferior tibiofibular joint, and the transverse ligament - located just inferior to the posterior tibiofibular ligament. Also deserving mention are the tough fibrous sheet known as the interosseous membrane which connects the tibia and fibula for nearly their entire length, and its inferior thickening - the interosseous ligament. It is important to remember that ankle fractures represent intraarticular injuries and should be treated with the respect due their serious nature.

In 1950 Lauge-Hansen developed a classification system which serves as an excellent tool in understanding the mechanisms of injury of various ankle fractures. The system recognizes four basic categories: 1) Supination-Adduction, 2) Supination-Eversion, 3) Pronation-Abduction, and 4) Pronation-Eversion. The first word of each category represents the position of the ankle prior to injury and the second word indicates the direction of the deforming force. When the supinated foot is insulted by a medial force (Supination-Adduction) a transverse fracture of the lateral malleolus or disruption of the lateral ligamentous structures results, followed by fracture of the medial malleolus. This category may be thought of as the typical inversionary ankle injury. When the foot is supinated and an external rotatory force is applied (Supination-Eversion) failure of the anterior tibio-fibular ligament occurs, followed by spiral fracture of the lateral malleolus. Further progression of the supination-eversion mechanism yields fracture of the posterior lip of the distal tibia and eventually fracture of the medial malleolus or deltoid ligament obliteration. When the pronated foot is laterally assaulted (Pronation-Abduction) failure of the deltoid ligament or medial malleolar fracture occurs, followed by rupture of the posterior tibiofibular and transverse ligaments and finally fractures of the posterior lip of the distal tibia and supramalleolar fibula. When the foot is pronated and an external rotatory force is applied (Pronation-Eversion) the medial malleolus or deltoid ligament is again insulted. Progression of this injury mechanism results in anterior tibiofibular and interosseous ligament disruption, intersosseous membrane tear and spiral fracture of the fibula eight centimeters or more above the lateral malleolus. The final victims of the pronation-eversion mechanism are the posterior lip of the distal tibia and the posterior tibiofibular ligament.

Another commonly used ankle fracture classification system is that of Danis-Weber (3). It concentrates on the fibular pathology associated with these injuries and is considered useful in planning their surgical management. A Danis-Weber Type A fracture is essentially an avulsion fracture of the lateral malleolus with or without a medial malleolar fracture. This corresponds with the Lauge-Hansen Supination-Adduction injury. A Danis-Weber Type B fracture represents a spiral fracture of the distal fibula associated with some degree of disruption of the inferior tibiofibular joint. A medial malleolar fracture or deltoid ligament derangement may also accompany this injury. Danis-Weber’s Type B fracture
is considered analogous to the Lauge-Hansen Supination-Eversion injury (4). A Danis-Weber Type C fracture is basically any fracture of the fibula with concomitant disruptions of the inferior tibiofibular joint and interosseous membrane. The Type C is also associated with medial malleolar or deltoid injury. The Danis-Weber Type C roughly corresponds to the pronation injuries described by Lauge-Hansen (4). Both the Lauge-Hansen and the Danis-Weber classification systems aid the healthcare professional in the management of ankle fractures by providing a level of standardized terminology in addition to a better understanding of fracture etiologies.

The language of ankle fractures is at times quite confusing due to perpetuation of various eponyms. Pott’s Fracture is commonly used to describe co-existing fractures of the medial and lateral malleoli (bimalleolar fracture), but this is actually a misnomer as Pott’s original description included only a distal fibular fracture and deltoid ligament disruption with no mention of malleoli (3). Destot named the posterior lip of the distal tibia the third malleolus in 1912, and fracture of this structure in conjunction with the other two malleoli is labeled as Cotton’s Fracture (3). Maisonneuve described a curious deltoid injury which transmitted its forces proximally through the interosseous membrane to produce a fracture of the proximal third of the fibula (3). Maisonneuve’s Fracture demands careful radiographic evaluation of the entire fibula and deserves mention along with ankle fractures.

Ankle fracture management may be disrupted by a variety of complications. Nonunion (cessation of bone repair) may occur due to periosteal flaps or other soft tissue intruding into the fracture site and may prompt open reduction and internal fixation of the fracture. Nonunions are most notable in medial malleolar fractures, occurring in as many as 15% of closed reductions (3). Malunions (bone healing with rotatory or angulatory deformity) may also give rise to an undesirable result by its typical shortening of the lateral malleolus, lengthening of the medial malleolus, and superior displacement of the posterior malleolus (3). Infection rates as high as 18% in open treatment of closed fractures also demand the orthopaedic surgeon’s respect (3). Another potential complication is the sympathetic dystrophy known as Sudeck’s atrophy. It is characterized by thin, shiny skin, osteoporosis distal to the injury, excessive hair growth, loss of muscle mass, and intense burning pain. The late complication of post-traumatic arthritis also occurs in 20-40% of these ankle fractures irrespective of the mode of treatment (3).

Ankle fractures are serious intraarticular injuries. Their management in athletes requires perhaps a more skilled approach than the average patient. Members of a sports medicine staff should be familiar with common ankle fracture mechanisms and classification systems, as well as potential complications.

References

ANSWERS TO PREVIOUS CEU CREDIT QUIZ
“Evaluation, Treatment and Rehabilitation Involving A Submuscular Transposition of the Ulnar Nerve at the Elbow”
1. a 6. c
2. e 7. a
3. b 8. d
4. b 9. d
5. e 10. a
CEU Credit Quiz

ANKLE FRACTURES:
Common Mechanisms, Classifications, Complications
Charles T. Mehlman, ATC

As an organization accredited for continuing medical education, the Hahnemann Medical College and Hospital certifies that this continuing education offering meets the criteria for .3 hours of prescribed CEU credit in the program of the National Athletic Trainers’ Association, Inc., provided the test is used and completed as designed.

To participate in this program, read the material carefully and answer the questions in the test. Mark the answers you select by placing an X in the proper square. Then xerox the test sheet, fill in your name, address and other information, and mail with $12 for processing to Hahnemann University, School of Continuing Education, Broad and Vine, Philadelphia, PA 19102.

The NATA National Office will be notified of all members with passing scores over 70%. CEU credit will be issued to each member’s record at that time. Participation is confidential.

<table>
<thead>
<tr>
<th>Questions</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
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</thead>
<tbody>
<tr>
<td>1. The range of motion of the ankle joint is normally</td>
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<tr>
<td>1. 90° of dorsiflexion.</td>
<td>a. 1,3</td>
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<td>2. 50° of dorsiflexion.</td>
<td>b. 1,4</td>
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<td>3. 20° of plantarflexion.</td>
<td>c. 2,3</td>
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<td>4. 40° of plantarflexion.</td>
<td>d. 2,4</td>
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<td>2. Dorsiflexion affords the talocrural joint greater stability than plantarflexion does.</td>
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<td>a. True</td>
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<td>b. False</td>
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<td>3. Lateral support of the ankle is provided by the</td>
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<tr>
<td>1. talofibular ligament.</td>
<td>a. 1,2,3</td>
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<td>2. calcaneofibular ligament.</td>
<td>b. 1,3</td>
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<td>3. posterior talofibular ligament.</td>
<td>c. 2,4</td>
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<td>4. deltoid ligament.</td>
<td>d. 4 only</td>
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<td>e. 1,2,3,4</td>
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<td>4. A supination-adduction injury may result in a</td>
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<td>a. transverse fracture of the lateral malleolus.</td>
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<td>b. disruption of the lateral ligamentous structures.</td>
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<td>c. fracture of the posterior lip of the distal tibia.</td>
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<td>d. a and b above</td>
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<td>e. all of the above</td>
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<td>5. When the foot is supinated and an external rotatory force is applied, failure of the ________ ligament occurs.</td>
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<td>a. deltoid</td>
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<td>b. anterior tibiofibular</td>
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<td>c. posterior tibiofibular</td>
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<td>d. transverse</td>
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<td>6. Progression of a pronation-eversion injury results in</td>
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</tr>
<tr>
<td>1. anterior tibiofibular disruption.</td>
<td>a. 1,2,3</td>
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<tr>
<td>2. interosseous ligament disruption.</td>
<td>b. 1,3</td>
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<tr>
<td>3. interosseous membrane tear.</td>
<td>c. 2,4</td>
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<tr>
<td>4. spiral fracture of the fibula.</td>
<td>d. 4 only</td>
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<td>e. 1,2,3,4</td>
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7. A Danis-Weber Type A fracture corresponds with the Lauge-Hansen _______ injury.
   a. supination-eversion
   b. pronation-abduction
   c. supination-adduction
   d. pronation-eversion

8. Which type of Danis-Weber fracture causes medical malleolar or deltoid injury?
   a. Type B
   b. Type C
   c. both a and b above
   d. none of the above

9. Any fracture of the fibula with concomitant disruptions of the inferior tibiofibular joint and interosseous membrane qualified as a Danis-Weber Type A fracture.
   a. True
   b. False

10. A bimalleolar fracture is commonly termed a
    a. Pott's fracture.
    b. Destot fracture.
    c. Cotton's fracture.
    d. Maisonneuve's fracture.

11. Which of the following statements is/are true regarding malunion of ankle fractures?
    a. 1,2,3
    b. 1,3
    c. 2,4
    d. 4 only
    e. 1,2,3,4
    1. This is bone healing with rotatory or angulatory deformity.
    2. The occurrence rate is 18-22%.
    3. It may cause shortening of the lateral malleolus.
    4. Most commonly they occur in posterior malleolus fractures.

12. Diagnostic features of Sudek's atrophy include
    a. 1,2,3
    b. 1,3
    c. 2,4
    d. 4 only
    e. 1,2,3,4
    1. thin, shiny skin.
    2. excessive hair growth.
    3. loss of muscle mass.
    4. intense burning pain.

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Abstracts of 1988 National Convention
Free Communications Papers

Following are abstracts of the papers that have been selected for presentation during the free communications session of the National Convention in Baltimore. Since there will be too many communications this year (posters and oral), we have divided the abstracts accordingly. The oral presentations are presented here in the order they will be presented in Baltimore. Again, thanks to Russ Cagle and his committee for expediting their work and providing this information to us in time for publication.

ORAL PRESENTATIONS

WATER EXERCISE VS. WEIGHT TRAINING EXERCISE IN THE DEVELOPMENT OF KNEE EXTENSION AND FLEXION STRENGTH

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The purpose of this investigation was to compare weight training exercise with water resistance exercise in the development of strength of the knee flexors and extensors. Thirty-seven healthy untrained male and female subjects (ages 18-31 years) participated in an eight-week training study. All subjects were pre and posttested on the Cybex II isokinetic dynamometer. The weight trained group (n=14) and the water exercise group (n=14) performed four specific lower extremity exercises, three times per week. The control group (n=9) remained inactive for the duration of the study. An ANOVA revealed significant differences at the .05 level between the group total sum score at 60 degrees per second and on extension at 60 degrees per second. It was concluded that the weight trained group was significantly better at 60 degrees per second but a trend in the water group results suggests that the water trained group may perform better at faster speeds, which were not measured in this study.

EFFECT OF DURATION ON RUNNING INJURIES AMONG SOLDIERS

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The purpose of this study was to examine the relationship of lower extremity musculoskeletal injuries (MI) to the duration of running among young (x age = 20.8 +/- 4.1 yrs) healthy soldiers. Three hundred and seventy-two soldiers participated in a mandatory physical conditioning program. Subjects were assigned to either a 20-, 30-, or 40-minute running group and ran at 70% of heart rate reserve on three alternate days for five weeks. The Army Physical Fitness Test was administered to participants at the beginning and end of the study. All MI during this period were diagnosed and recorded by hospital physical therapy staff. An injury was defined as a hospital visit that resulted in lost military training time. Results indicate that: 1) all three groups significantly (p<0.05) improved their running times during the program; 2) the most frequently reported injury was tibial stress reaction syndrome which accounted for 19, 11, and 20% of all injuries in the 20-, 30-, and 40-minutes groups respectively; 3) the injury rate for males rose (6, 9, 14%) as the duration of running increased (20-, 30-, 40-min), but the increases were not significant; and 4) among females there were significantly fewer injuries in the 30-min group (12%) than in the 20-and 40-minutes groups (30 and 30%). Based upon the results of this study we conclude that increasing running time has little effect upon injury rate among young, healthy soldiers.

THE EFFECTS OF SELECTED ANKLE PROPHYLAXIS ON INVERSION RANGE OF MOTION

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It was the purpose of this study to investigate the supportive capabilities of prophylactically applied tape and selected prosthetic ankle devices upon inversion range of motion. The subjects for this study were thirteen male recreational basketball players ranging in age from 21 to 43 years. The volunteer subjects were randomly assigned to one of five restrictive conditions per day for five testing sessions. The restrictive conditions consisted of a control, closed basketweave ankle taping, and three commercially manufactured prosthetic ankle devices. The control condition measurement was obtained from each subject during their initial testing date. Range of motion measurements were obtained from each subject prior to participating in three recreational basketball games per session. Range of motion measurements were obtained and recorded both with and without each subject wearing athletic shoes. This exact sequence was repeated at mid-exercise, post-exercise relace. A 5(RC)*4(Time)*2(Foot)*2(Shoe) ANOVA with repeats on all factors was conducted to determine if any differences existed between treatments. In the event that the omnibus test for interaction was found to be significant at the .05 level, simple main effects were then investigated. If the simple main effects were found to be significant, the Student Newman Keuls procedure was utilized to determine where the differences existed. Results indicated a significant interaction effect for five of the six two-way interactions. Specifically, significant interactions were obtained for the following pairs of independent variables: RCxTime, RCxShoe, ShoexTime, and ShoexFoot. The results of this investigation indicate that two of the three prosthetic devices tested provide range of motion limitations similar to that of tape from the beginning until the end of exercise. A major contention of the manufacturers of these prosthetic devices is that they restrict range of motion as effectively as tape. The results of this investigation appear to confirm this contention. The results of this investigation also seem to indicate that relacing the prosthetic devices after the exercise bout reduces the range of motion significantly from the post exercise time period.
The purpose of this investigation was to measure the temperature gradients and heat dissipation configurations of air bladder type football helmets (ABFH). It was hypothesized that the new style ABFH, in compliance with rigorous safety standards that mandate additional impact absorbing pads and bladders may inadvertently create a poor micro-environment in which to dissipate cranial heat. Eight varsity football players volunteered to exercise at 70% of their VO2-max, as measured by a standard bicycle ergometer protocol for thirty minutes. The work bout took place in a controlled environmental chamber. Air temperature (AT) (X = 36.9°C), relative humidity (RH) (X = 96%) and solar radiation (SR) (X = .5029 watts/cm2) were created to replicate a typical August afternoon practice session in the southern region of the United States (Lat. 31.5°N). Rectal core temperature (RCT), helmet skin temperature (HST) and helmet air temperature (HAT) were monitored every 2 minutes by three separate YSI 400/405 temperature probes interfaced with a digital YSI 2100 tele-thermometer. Data were analyzed using repeated measures analysis of covariance (ANCOVA). While statistically controlling for initial temperatures, RCT, HST, and HAT increased significantly (p < .05) across the 15 two-minute ergometer time intervals. HST leveled off during the last eight minutes of the 30-minute exercise bout (37.27°C). Both RCT and HAT continued to increase significantly across time (p < .05). Consequently, the data suggest that normal skin temperature regulatory mechanisms allow for the dissipation of collected HST. The ability to dissipate cranial heat is not evident due to the increased HAT. The basic recommendation would be to allow the athlete to remove the ABFH periodically to dissipate accumulated heat thus enhancing a more favorable temperature gradient between RCT and HAT.

NON-OPERATIVE REHABILITATION OF GRADE I & II SPRAINS OF THE MEDIAL COLLATERAL LIGAMENT IN ATHLETES.

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The purpose of this paper is to present the specific protocol and rationale of a non-operative rehabilitation program for Grade I and Grade II sprains of the medial collateral ligament (MCL) of the knee in athletes. During 2 years (1985-86) providing medical coverage for numerous scholastic programs, 52 injuries to the MCL were diagnosed and treated, 35 were Grade I sprains and 17 were Grade II sprains. All were managed identically with an active rehabilitation program based on scientific factors regarding healing constraints, muscle physiology, and neuromuscular factors. Immediately following the injury the athlete was initiated on a program to reduce effusion and pain, prevent quadriceps femoris atrophy through electrical stimulation and maintain range of motion (ROM) through passive ROM exercises. Later stages of rehab included rigorous strengthening and flexibility exercises, proprioceptive activities and specific functional drills related to the injured athlete’s sport and position. All athletes returning to contact sports received a lateral knee brace. Players sustaining a Grade I sprain returned to competition after an average of 9.2 days of rehab and those with a Grade II sprain returned after 17.8 days. The probability of sustaining an MCL sprain was 6 times greater for football players as opposed to other sports, with defensive linemen being most likely to sustain this specific injury in our study. Of the 52 athletes participating in this study, 37% are currently participating in scholastic sports. To date there have been 3 re-injuries (6%) of the MCL in these athletes. This five phase program is based on the athlete fulfilling specific criteria for progression from one phase to the next. The program is based on four principles: early reduction in effusion, early motion, retardation of muscle atrophy and specificity of rehabilitation.

FREQUENCY OF SUBSEQUENT SURGERY AND INJURY AND RESUMPTION OF FULL ACTIVITY FOLLOWING A SEVERE ANTERIOR CRUCIATE LIGAMENT INJURY

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Functional ability following an anterior cruciate ligament (ACL) is defined as the revival of a physically active lifestyle, and the ability to perform activities of daily life. The sequence of instability, knee pain, swelling, intra-articular damage, meniscal degeneration, and physical inactivity will preclude a cadet from returning to the demanding activities of his daily life. The acute decision to surgically repair the severely injured ACL depends on the age and activity level of the young athlete and on appropriate research. The purpose of the study was to ascertain the frequency of resumption to a physically active lifestyle and the ability to perform daily activities following a severely injured ACL. When cadets sustain an ACL injury, their careers and their ability to resume in the physical demands of that career may be jeopardized. In the study, 64.7% and 76% of the cadets who selected no acute reconstruction had subsequent knee arthroscopy and injury, respectively. Also, over 35% decided to have ACL reconstructive surgery within two years. Only 31% of the acutely reconstructed ACL injuries had minor subsequent surgery. Most of the cadets (62.9%) who selected acute ACL reconstruction returned to full functional ability as measured by their ability to participate in a physically demanding obstacle course required of all cadets. These results suggest that the prognoses for the ACL injured athlete are promising for those who select acute reconstruction following a severe ACL sprain. The outlook for the ACL deficient knee appears grim, particularly to the youthful athlete who hopes to continue in physically stressful sporting events. These results appear to support the conclusions of Rovere and Adair (1983) that athletes who sustain an ACL injury and select reconstructive surgery perform significantly better on functional ability tests than those who select no acute reconstruction.

EFFECT OF TWO ISOTONIC RESISTANCE TRAINING PROGRAMS ON ANTERIOR KNEE JOINT LAXITY

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Several adaptations to endurance exercise have been
reported in connective tissue and include hypertrophy and increases in strength and collagen fiber density in tendons and ligaments. Increases in ligament-bone junction strength have also been reported. Exercise programs that cause a decrease in anterior tibial translation may offer protection from injury to the anterior cruciate ligament. The purpose of this study was to measure the effect of two resistance training programs on anterior knee joint laxity in healthy untrained college females. Fourteen subjects (x age = 20.4 yrs, x ht = 65.2 in, x wt = 129 lbs) were randomly assigned to a hamstring strengthening group (Gp I, N=7) or a hamstring and quadricep strengthening group (Gp II, N=7). It was hypothesized that the two exercise protocols would decrease anterior tibial translation, and that Gp II would have a greater decrease than Gp I due to ACL adaptation from stress during resisted knee extension. Subjects exercised 3 times per week for 10 weeks. The contralateral limb served as the control. Pre and post-condition laxity was assessed with a KT 1000 knee arthrometer under four loading forces; 15 and 20 lb. passive, maximum manual passive and maximum active by quadricep contraction. A five factor mixed model ANOVA failed to identify any significant interactions. However, several change trends in joint laxity were observed. Under the 20 lb force laxity decreased for Gp I (pre x = 4.36 mm, post x = 4.21 mm; A = .15 mm) and Gp II (pre x = 3.43 mm, post x = 3.36 mm; A = .07 mm). Also, maximum manual passive loading decreased for Gp I (pre x = 5.71 mm, post x = 5.14 mm; A = .57 mm) and Gp II (pre x = 4.71 mm, post x = 4.43 mm; A = .28 mm). Under maximum active loading, laxity decreased for Gp I (pre x = 3.64 mm, post x = 2.79 mm; A = .85 mm) and increased for Gp II (pre x = 2.43 mm, post x = 2.71 mm; A = .28 mm).

A protocol of endurance exercise or a resistance training program of greater frequency, duration and intensity may be necessary to produce larger changes in joint laxity. Also, because a significantly greater amount of anterior translation was produced during the maximum manual passive loading (p < .05), a predetermined load greater than 20 lbs may be necessary to assess the effects of an exercise protocol on knee joint laxity. Finally, further study is needed to assess the effects of different levels of activity, body temperature, and endocrine activity on the valid and reliable measurement of joint laxity in human subjects.

ISOKINETIC EVALUATION OF CONTRALATERAL LIMB SYMMETRY FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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Measurement of isokinetic muscle parameters is commonly performed following anterior cruciate ligament (ACL) reconstruction to assess the dynamic status of the knee and to monitor progress in rehabilitation. This study was designed to evaluate contralateral limb symmetry of the quadriceps and hamstring musculature of subjects who had undergone one of two types of ACL reconstructions. Further, subjects were evaluated for differences on selected isokinetic parameters between types of surgery and lengths of postoperative period. Postsurgical and healthy contralateral limbs of 46 subjects aged 18-49 years (mean = 23.7 yr) were divided into groups according to type of autogenous intra-articular ACL substitute and length of postoperative period. Results of paired t-tests and analyses of variance indicated significant contralateral asymmetry existed for all measures of quadriceps and hamstring musculature strength and endurance (p < .001) irrespective of type of reconstruction technique. Average surgical knee deficits in hamstring endurance were significantly less for the Long Term (41-101 months) group (1.9%) than for the Intermediate (24-40 months) group (12.1%). The results suggest that extended periods of time are required to approximate hamstring endurance symmetry following ACL reconstruction. The contralateral limb asymmetries observed in these subjects may either be a reflection of the incompleteness of rehabilitation or the inability to regain full isokinetic strength and endurance following ACL reconstruction.

RELATIONSHIP BETWEEN SHOULDER AND ELBOW ISOKINETIC PEAK TORQUE, AVERAGE POWER, AND TOTAL WORK AND THROWING VELOCITY IN INTERCOLLEGIATE PITCHERS

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This investigation examined the relationship between several isokinetic measures and throwing velocity in intercollegiate pitchers. Ten pitchers (x age = 18.6 yrs, x ht = 185.42 cm, x wt = 83.53 kg) were tested for peak torque (PT) at 60 and 240 deg/sec, and average power (AP) and total work (TW) at 240 deg/sec during shoulder extension and flexion, shoulder internal and external rotation, and elbow flexion and extension on a Cybex isokinetic dynamometer interfaced with a Cybex Data Reduction Computer. Throwing velocity was measured with an M.P.H. K-15 tripod-mounted radar device during a second test session, and ranged from 68.13 to 79.83 mph (x = 76.57 mph). Pearson Product Moment correlations were computed to determine the relationship between throwing velocity and each isokinetic measure for each muscle group tested. Significant correlations were not found between throwing velocity and isokinetic measures obtained during shoulder flexion and extension and elbow flexion and extension. During shoulder internal rotation (240 deg/sec), significant correlations were found between throwing velocity and PT (r = .66, p = .05), AP (r = .80, p < .01), and TW (r = .81, p < .01). Significant correlations were also observed between throwing velocity and shoulder external rotation (240 deg/sec) PT (r = .75, p < .05), AP (r = .76, p < .05), and TW (r = .78, p < .05). Correlations between throwing velocity and shoulder internal and external rotation PT at 60 deg/sec were not significant. These findings may suggest that for the muscle groups tested in this study, the strongest relationship between muscular activity and throwing occurs at the shoulder internal and external rotators. This suggests training programs designed to enhance throwing velocity should focus especially on these muscle groups. These findings also suggest that because significant correlations for PT were found only at 240 deg/sec, isokinetic training programs should occur primarily at fast speeds of contraction. These hypotheses need to be investigated further.
Most sports require some form of running. Whether this includes short sprints or continuous running, over a period of time this repeated stress may lead to arch injury. Two devices frequently employed to support a weak or injured medial longitudinal arch are tape and pre-fabricated soft orthoses (PFISO). The purpose of this study was to compare arch taping and PFISO's in their ability to: 1) support the medial longitudinal arch, and 2) decrease force on this area during ambulation.

Eighteen recreational joggers and aerobic dancers ages eighteen to twenty-four who were experiencing medial longitudinal arch pain participated in the study. The instrument used in this study was “Electrodynography” (EDG) a computer that measures forces on the foot during ambulation. EDG electrodes were applied to each subject’s feet. The EDG computer was then turned on and each subject was instructed to walk at a cadence of one-hundred steps per minute for twenty meters. Each subject was tested while barefoot, with shoes, with longitudinal arch taping while wearing shoes, and with PFISO’s inserted into the subject’s shoes. The data revealed that tape did help to support the arch. The data also showed a significant difference (p < .05) between the arch taping and the PFISO’s. The PFISO was found to be more effective than tape in supporting the injured arch. It was interesting to note that when the subjects were asked to compare the tape and the PFISO, seventeen (94%) stated that the PFISO was more comfortable, but the tape felt more supportive. Based upon the results of this study the investigator is of the opinion that many athletes assume that because arch taping is less comfortable than PFISO’s, it must be more supportive. The results of this study indicate that arch taping and PFISO’s are effective in supporting the injured or weak medial longitudinal arch. However, the investigator recommends that when budget allows, a $7.00 pair of PFISO’s be used alone or in conjunction with tape to support this area.

EFFECT OF THREE LATERAL KNEE BRACES ON SPEED AND AGILITY IN EXPERIENCED AND NON-EXPERIENCED WEARERS

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The purpose of this study was to examine the effect of three lateral knee braces on speed and agility in subjects experienced as brace wearers and subjects with no prior experience as brace wearers. Nineteen post-graduate military academy football players served as subjects (x age = 18.5 yrs). Nine subjects had prior experience and were accustomed to wearing lateral braces and 10 subjects had no prior experience wearing a brace. All subjects were tested for speed and agility after four treatment conditions including no brace (NB), McDavid Knee Guard (MKG), Donjoy Defender (DJ) and Anderson Knee Stabiler (OMNI). Subjects performed a 40 yd. forward sprint and a 20 yd. backward sprint during one test session, and performed a 10 yd. shuttle run and 40 yd. square cone drill during a second test session. The average of two hand held times was recorded. The order of treatment condition and performance test was randomized for each subject. ANOVA indicated for experienced wearers, 40 yd. dash times were faster for NB than for the three braced conditions (p < .05) (NB vs MKG \( \Delta = .17 \) sec, NB vs DJ \( \Delta = .15 \) sec, NB vs Omni \( \Delta = .15 \) sec). No differences were observed between the three braces.

20 yd. backward sprint times were faster for the NB than for MKG (p < .05) (NB vs MKG \( \Delta = .13 \) sec). Also, DJ time was faster than MKG (p < .05) (DJ vs MKG \( \Delta = .14 \) sec). No significant interactions were found for the two agility performance tests. For non-experienced wearers, 40 yd. dash times were faster for NB than MKG and DJ (p < .05) (NB vs MKG \( \Delta = .16 \) sec, NB vs DJ \( \Delta = .11 \) sec). 20 yd. backward sprint times were faster for NB than for the three braces (p < .05) (NB vs MKG \( \Delta = .17 \) sec, NB vs DJ \( \Delta = .11 \) sec, NB vs Omni \( \Delta = .10 \) sec). Square cone times were faster for NB than for the three braces (p < .05) (NB vs MKG \( \Delta = .36 \) sec, NB vs DJ \( \Delta = .35 \) sec, NB vs Omni \( \Delta = .58 \) sec). Shuttle run times were faster for NB than for MKG (p < .05) (NB vs MKG \( \Delta = .20 \) sec). For non-experienced wearers, no differences were found between the three braces during any of the performance tests. These findings suggest that for experienced wearers the effect of knee bracing is greatest on reducing speed, while for non-experienced wearers both speed and agility were reduced. In general, little difference was found between the three braces during each of the performance tests.

FUNCTIONAL PERFORMANCE TESTS FOR THE ANTERIOR CRUCIATE LIGAMENT INSUFFICIENT ATHLETE

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Very few instruments are available to objectively establish the functional capacity of the Anterior Cruciate Ligament (ACL) insufficient athlete. This deficiency has forced the clinician to rely on criteria which often are inappropriate and speculative with regards to their relationship with the function required by the athlete upon return to sport participation. As a result of the use of these poor criteria, the athlete’s self-assessment of function is often relied upon, promoting early return to activity and recurrent injuries. The objective of this paper is to provide the clinician with an objective instrument to assess the functional capacity of the ACL insufficient athlete which reproduces the functional maneuvers required during athletic participation. Three Functional Performance Tests (FPT) were developed including the co-contraction test, the carioca crossover test, and the shuttle sprint test. The co-contraction test was designed to reproduce the rotational forces at the knee and assess the athlete’s ability to dynamically control tibial translation. The carioca test was designed to reproduce the pivot shaft phenomenon and assess the athlete’s ability to compensate for the shift. Finally, the shuttle run was designed to reproduce the acceleration, deceleration and cutting actions and assess the athlete’s capacity to perform these maneuvers. The tests are performed at the athlete’s maximum controlled speed. The FPT presented here have been implemented and show to be associated with the athlete’s functional capacity. These results should assist the clinician in determining the functional capacity of the ACL insufficient athlete and the FPT identified may be used to augment previous criteria used as determiners for return to competition. The objectivity of the FPT facilitates less speculative decisions regarding the functional capacity.
of the ACL insufficient athlete and will allow the clinician to rely less upon the athlete’s self-assessment of his/her functional capacity.

POSTER PRESENTATIONS

POLICIES REGARDING THE USE OF ANKLE TAPING/STRAPPING AND ANKLE BRACES IN BASKETBALL


The purpose of this study was to survey basketball athletic trainers in four N.C.A.A. Athletic Conferences for their professional thoughts concerning ankle taping/strapping, and ankle braces during the 1985/86 and 1986/87 seasons. The major findings of this survey are: (1) Eighty-three percent of the responding athletic trainers have a team policy on taping ankles for stability. (2) Most players are allowed to choose between wearing ankle braces and ankle taping/strapping. (3) The majority of athletic trainers (55%) prefer Swede-O brand ankle braces. (4) Most athletic trainers believe that ankle braces would lessen the occurrence of ankle sprains.

COMPUTER ATHLETIC INJURY SYSTEM

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Computer integration is an important new aspect in the allied health professions. Physicians and medical students have used computers to hone diagnostic skills and as a reference for injury and illness treatment. Athletic trainers could benefit greatly from a computer program designed to teach, improve, refine and reinforce evaluative skills learned in the classroom and in the clinical setting. The Computer Athletic Injury System (CAIS) is an educational tool for the assessment of athletic injuries. It is designed to aid the examiner of athletic injuries in the proper thought sequences and processes needed to properly and efficiently assess athletic injuries. The computer acts as the injured athlete and the operator is the evaluator of the injury. The eleven most common injury areas have been identified in CAIS. They are: foot, ankle, knee, thigh, cervical spine, head, shoulder, elbow, wrist, finger and heat illness. The student may select a specific type of injury to evaluate or CAIS will provide the student with a random selection. The evaluator must determine how the injury occurred, what structures are affected, the visible signs and symptoms, tenderness, joint laxity, range of motion, strength, and ultimately, the functional status of the athlete to reach a correct impression of the injury. CAIS allows the student to practice evaluative skills and decision making on the health status of the simulated athlete. This program provides an excellent tool for perfecting injury assessment skills needed for comprehensive evaluation of athletic injuries.

ARTHROSCOPIC ACL PATELLAR TENDON GRAFT SURGERY AND REHABILITATION PROTOCOL

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The purpose of this clinical study is to investigate the Arthrosopic ACL Patellar Tendon Graft reconstruction surgery and the follow-up post-operative rehabilitation protocol. This study consists of 13 patients, 7 males and 6 females, ranging from 17-37 years old. The patient population consisted of 6 High School athletes (46%), 2 College athletes (15%), 4 Recreational athletes (31%) and 1 Non-athlete (8%). The mechanism of injury most common in this study with the disruption of the ACL was torsion (90%). Of the 13 patients who have used this procedure, only 1 patient has had any complications. The patient suffered from an episode of phlebitis 18 days after surgery and was hospitalized for 3 days. Since the hospitalization period, the patient has made a successful recovery from the surgical procedure. The post-operative rehabilitation protocol begins by using the CPM (15°-45°) and exercising out of the Hinged-type knee immobilizer the day after surgery. From Day 4 through the Fourth week, the Hinged-type knee immobilizer is set from 0°-90° and all exercising is done out of the immobilizer. Week 4 allows the patient to go from 2 creeps to 1 and may then progress to full weight bearing. A stationary bike program begins with low resistance for 15-60 minutes per day. At the 8 week phase, full weight bearing begins along with full flexion and extension exercises. Athletes who have had this specific surgical reconstruction of the ACL advance to full activities, including competitive sports, 3 to 6 months post-operatively. The results of this study have been quite impressive with the post-operative progress these patients have made. Additional research is still needed; more surgical candidates and long-term follow-up (18 months - 3 years) to see if this procedure can allow the patients to return to the level of competition that they competed at before the injury, to test the integrity of the graft and to see what the incidence of re-injury is to the surgically repaired knee.

THE EFFECTS OF PREVENTIVE KNEE BRACES ON SELECTED PERFORMANCE VARIABLES AMONG DIVISION I COLLEGE FOOTBALL PLAYERS

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The purpose of this study was to determine the effects of three selected preventive knee braces on forward and backward running speed. Thirty-four Division I college varsity football players, ranging in age from 19 to 22 years, were tested during three different testing sessions wearing either the Anderson Knee Stabler, the McDavid Knee Guard, or the Don Joy Knee Defender. A fourth session using no brace served as a control condition. The order of treatment for each subject was randomly assigned. During each session subjects were required to perform a series of 40 yard forward sprints and a series of 20 yard backward sprints. Times were recorded by the Whole Body Reaction Measuring Equipment - Electronic timing device. The data was analyzed using a repeated measures completely randomized block ANOVA (p<0.05). Results indicated that forward running speed was significantly decreased by all three preventive braces.
when compared to the control condition; however, there was no difference in the magnitude of this effect between the braces. Backward running speed was not affected by brace application. Since current literature involving the preventive potential of knee braces is often contradictory, the decision to utilize them or not may be influenced by the effect they have on performance. There has been limited research in this area which directly applies to the professional or college football populations. The purpose of this study was to compare the effects of three commercially available knee braces (Anderson Knee Stabilizer, DonJoy Knee Defender, and McDavid Knee Guard) on forward and backward running speed relative to a no brace control condition.

USE OF IONTOPHORESIS VS. PHONOPHORESIS IN THE TREATMENT OF “TENNIS ELBOW”

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Thirty-three subjects with “tennis elbow” pain of less than six months in duration were randomly divided into three groups: 1) treatment of iontophoreses and rest, 2) treatment of phonophoreses and rest, and 3) treatment of rest only. Patients rated their discomfort on a subjective pain scale. This was done at the initial treatment and on the treatments thereafter. The changes in the subjective pain scale were all found to be statistically significant, but the change in the iontophoresis group was the greatest, the phonophoresis group was next greatest and the rest only group was the least. Therefore, the authors recommend iontophoresis as an effective modality in decreasing the pain accompanying “tennis elbow”.

USE OF SILICONE RUBBER AS SPLINTING MATERIAL FOR HAND AND WRIST INJURIES

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In recent years many substances have been used as splinting materials for hand and wrist injuries. Many hand sprains and fractures can be immobilized in silicone rubber so that an athlete may continue to participate in contact sports. One type of silicone rubber casting method that has proven to be successful is that of kling gauze impregnated with RTV11 silicone rubber (GE). Injuries that can be treated in this way are stable metacarpal fractures, ulnar collateral ligament sprains of the thumb, stable phalangeal fractures, and moderate wrist sprains. The rubber allows the trainer to cast the limb in a functional position while the affected part is protected and immobilized. The casting process will take approximately 2 hours to complete. The first application step is to lubricate the hand and forearm with petroleum jelly. Then 2” kling gauze is wrapped in spica-fashion to the arm and hand. Now the silicone rubber can be applied to the kling gauze. Previous to application, the rubber is thoroughly stirred and a catalyst is added to the mixture. Stir for several minutes and let this set while wrapping the arm with gauze. Spread the silicone rubber over the gauze with a tongue blade. Alternate layers of kling gauze and rubber mixture until there are four layers. Allow rubber to dry about 1½ hours or until set. The cast may be covered with a plastic bag to prevent dripping. When the cast is dry, it may be removed from the athlete by cutting up the radial or ulnar side with scissors. The cast can be held on by taping or using a 2” ace wrap. The ace wrap tends to hold the cast together best and adds more protection. This cast has been applied to athletes who compete in such sports as football, soccer, basketball, and swimming. Athletes are able to return to activity sooner following an injury to the hand or forearm. Although still in the healing process, an athlete can safely participate in contact situations.

A FOUR-YEAR STUDY OF COLLEGIATE FOOTBALL GAME INJURIES ON ARTIFICIAL AND NATURAL SURFACES

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Injuries to collegiate football players participating on both artificial and natural grass surfaces has not been satisfactorily documented. Some variables associated with the football injuries experienced by collegiate athletes have been researched and reported. These variables such as the age of the artificial surface, the shoe/surface interface, the speed of the athletes on each surface, and others. However, no organized study has documented the injury rates to collegiate football players over an athlete's 4-year career. At the University of Nevada, Las Vegas, football injuries during games were studied over a 4-year period which coincides with the number of years an athlete would be eligible to participate. Game injuries occurring on natural grass were compared to those occurring on artificial turf during the football seasons from 1983-1986. All injuries were diagnosed by a medical doctor at the time of the injury, and records kept on a computer system. The three most common injury sites during this study were to the knee, ankle, and shoulder. Interestingly, injuries to the knee, ankle, and shoulder respectively were most common on artificial turf. Whereas, on natural grass the order of injuries followed the ankle, shoulder, and knee. There seems to be an increasing trend in the injury rates on artificial surfaces as the turf ages as demonstrated by earlier researchers. Further research should be completed on some of the noted variables to discern their effect on the injury rates of collegiate football players participating on both artificial and natural grass surfaces.

SPORTS INJURIES: A COMPUTER-ASSISTED INSTRUCTIONAL PROGRAM

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“Sports Injuries”, a computer-assisted instruction (CAI) program, is an easy to follow, step by step computer program for student athletic trainers. It is designed as a practical tool and will serve these three basic functions:

A. To assist the student athletic trainer in acquiring more detailed knowledge in the field of athletic training.

B. To permit the instructor to integrate information and practical application of athletic training techniques.

C. To allow the learner to work at his/her own pace.

This C.A.I. consists of four units: ankle, knee, shoulder, elbow/wrist/hand. The organizing elements of each unit include: anatomy, basic treatment, common injuries and injury evaluation format. At the conclusion of each
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All submitted abstracts are sent to a sub-committee consisting of members of the NATA Research and Injury Committee. Each member of this group will independently review and rank each abstract submitted without benefit of the author’s name or affiliation. Final selection of the abstracts for presentation are determined by the review committee’s order of merit and the amount of time allotted for Free Communication Sessions at the Annual Symposium. Each presenter will have fifteen minutes in which to deliver his/her topic. Notification will be made in plenty of time for the preparation of your topic.

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1) Type title of paper or project in all capital letters, flush left.
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Manual Therapy: Mobilization of the Motion-Restricted Knee

William S. Quillen, MPA, PT
Joe H. Gieck, EdD, PT, ATC

Abstract

In spite of recent advances in surgical technique, utilization of constant passive motion (CPM) devices and functional post-operative bracing to encourage the early controlled restoration of range of motion, the sports therapist or athletic trainer will occasionally encounter an athlete who demonstrates difficulty in regaining normal joint motion. The traditional approach to such problems has been to apply sustained stretching techniques. This paper will present an introduction to the basic physiological and therapeutic principles of mobilization, a manual therapy alternative to such traditional approaches. The application of mobilization techniques to the motion-restricted knee seen in sports medicine is then illustrated.

The principle effect of inflammation and prolonged immobilization upon a synovial joint is the contraction of connective tissue structures. In spite of aggressive rehabilitation techniques, advances in arthroscopic surgery, and the use of constant passive motion (CPM) devices and functional post-operative bracing, athletes will occasionally demonstrate difficulty in regaining normal joint range of motion due to a restriction in contractile or connective tissue structures.

The traditional approach to such a problem joint has been to apply a passive sustained stretch without regard to a defined cause of motion limitation. This frequently results in: (a) an increased stimulation of pain receptors and (b) a reflexive contraction of antagonistic muscles, which further resists attempts at increasing motion. If by chance the motion limitation was purely muscular, an increase in range of motion might have occurred. However, as is the case in a majority of “problem” postsurgical knees, the limitation was due to joint capsule or ligament contracture, full restoration of function may not have happened. Muscular resistance would interfere before connective tissue could be effectively stretched.

The purpose of this paper is to present some of the physiological and therapeutic principles of mobilization and illustrate how this manual therapy technique may be applied in the restoration of movement to the motion-limited post-surgical knee seen in sports medicine.

To fully appreciate the problem presented by a stiff or contracted joint, it is necessary to take a further look at the principles of movement. Physiological joint movements (i.e., flexion, extension, abduction, adduction and rotation) that we measure and observe clinically are actually comprised of more subtle motions, termed accessory motions. Accessory motions are necessary for a fully functional, physiologic range of movement to occur. While physiologic movement is measured in degrees, accessory motions are measured in millimeters, but are nonetheless essential for proper function. While the traditional method of improving range of motion has been prolonged passive physiological movement, little regard has been paid towards the restoration of these accessory motions.

Accessory motions are of two types: component motions and joint play. Component motions include spin, glide and roll (1,4,7) and, when combined, produce the familiar cardinal plane motions. Joint play, on the other hand, may be defined as a motion that occurs within a joint in response to the application of an external force and not as a result of voluntary movement (10).

Theory of Mobilization

Mobilization of soft tissues is one of the oldest forms of physical therapy mentioned in ancient medical records (1,10). Hippocrates is reported to be the first to mention graded mobilization in the treatment of a shoulder joint that was stiff (1). Joint mobilization has been defined as “the attempt to improve joint mobility or decrease pain originating in joint structures by the use of selected grades of accessory motion” (1,10). Table 1 presents a comparison of traditional physiological (stretching) movement and accessory (mobilization) movement techniques.

All joint range of motion may be thought of as a continuum extending in range from active to pathologic. Mobilization techniques are designed to work within the anatomical limits of a joint’s available range of motion. Maitland (8), a noted Australian manual therapist, has divided mobilization techniques into four grades based upon range of motion considerations. Figure 1 illustrates how the amplitude of each mobilization grade falls within the range of motion continuum. Grade I mobilizations are of small amplitude and occur at the beginning of the available range of motion. They are often used to relax tense muscles and modulate pain sensation. Grade II mobilizations are of a larger amplitude and conducted from the beginning to well within the available range of motion, while a Grade III mobilization, also of a larger amplitude, progresses from within the available range of motion to reach the point of motion restriction. Grade IV mobilizations are of a small amplitude and occur at the end of the available range. Sometimes reference is made to a Grade V procedure. This is a high velocity thrust of small amplitude performed beyond the end of the available range of motion, but within anatomical limits. This

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Joe H. Gieck is an Associate Professor, Curry School of Education and Department of Orthopaedics and Rehabilitation and Head Athletic Trainer, University of Virginia, Charlottesville.
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technique is more frequently referred to as manipulation and its discussion is beyond the scope of this paper. Its use is best left to those trained in this advanced skill.

Mobilization involves elongating the joint structures in the direction of motion restriction, then oscillating the structures for a 20-60 second period four to five times within a treatment session. Treatment times may appear deceptively short; however, several hundred stresses are directed at the structures responsible for the motion restriction. A minimum number of techniques, directed toward the identified accessory motion restrictions, allows for a clearer assessment of response to intervention.

Mobilization techniques should be employed on an alternate day basis (1,10). This allows connective tissue structures sufficient time to recover from the irritation of mobilization and the athletes can utilize these non-mobilization days to reinforce any gains through traditional active motion exercise and self-mobilization techniques.

Application Principles

Prior to initiating any mobilization techniques, a careful assessment of the joint’s status must be undertaken. An acutely inflamed joint may not be a candidate for mobilization. Gentle Grade I and II techniques may be initiated on subacute joints to reduce pain and relax surrounding musculature, with more vigorous Grade III and IV mobilizations reserved for the less sensitive chronic joint restrictions. Table 2 provides a summary of joint status and indications for mobilization.

The direction of application of the mobilization force is dependent upon the joint surface contour of the limb that is to be mobilized. The “Concave-Convex Rule” (Figure 2), states that a mobilization force should be applied opposite the desired limb movement with a convex shaped joint surface, while a concave shaped joint surface limb or segment will have a mobilizing force applied in the same direction as the desired movement (1,8,10). Recalling that the component motions of roll, glide and spin combine to produce physiological movement, it is easy to envision a surface rolling in the direction of limb movement—while a gliding motion is dependent upon the segment joint surface contour.

Perhaps the most important concept in the application of mobilization is the amount of force to be imparted during the graded oscillations applied to the connective tissue structures. Figure 3 depicts the generalized stress-strain behavior of connective tissue (i.e., capsular, retinacular, ligamentous) structures. Tissues which are contracted and interfere with accessory motion and physiological movement need to have sufficient stress applied (external force) to result in an adequate strain (change in length) to effect a permanent change in resting length. Force alone will not result in resting length change. Rather the stress must be of sufficient duration and applied in a bio-mechanically correct manner to produce a therapeutically desirable result.

Restoration of accessory motions, through a lengthening of connective tissue structures is the primary goal of mobilization.

Grade I and II mobilizations, while indicated and highly effective in the modulation of pain and relaxation of tense musculature, minimally stress tissues and then only within the elastic portion (point A) of the stress-strain curve. Tissues stressed within this elastic portion of the curve will return to their initial resting length (point a) without producing change in accessory motions over time. Grade III and IV mobilizations are required to stress connective tissue structures sufficiently into the plastic deformation portion of the curve to produce temporary (point b) or relatively permanent (point c) changes in the joint capsule/ligament resting lengths. Application of forces beyond the plastic deformation stage of the stress-strain curve can result in a weakening of tissues in a process known as “necking” and can lead to structural failure (point X).

Contraindications and precautions to the application of mobilization techniques are relatively few. Whether to perform a mobilization on an athlete’s stiff or painful joint is primarily a function of the signs and symptoms gained from the evaluation prior to treatment and not of some abstract diagnosis. One should remain cognizant of the particular surgical procedure performed when...
Figure 4a. Superior glide of the patella in the trochlear groove. Note: The body segment with a dot (in subsequent Figures) should be fixed or stabilized, while those with an arrow are moved in the direction indicated by the arrow. Mobilization patterned after Paris (10).

Figure 4b. Inferior glide of the patella in the trochlear groove. See note Figure 4a.

Figure 4c. Lateral glide of the patella mobilizing the medial retinaculum. See note Figure 4a.

Figure 4d. Lateral glide of the patella with long axis tilt by thumb and middle finger. See note Figure 4a.

Figure 5. Medial and lateral tilts and varus and valgus stress to knee joint capsule. See note Figure 4a.

Figure 6a. Long axis traction (distraction) to knee joint capsule. See note Figure 4a.

Keeping these anatomical and physiological principles in mind, mobilization can become a safe and highly effective addition to any therapeutic regimen designed to restore motion to a stiff or contracted joint. Appropriately applied mobilization will:

1. Safely elongate connective tissue adhesions restricting accessory motion and joint play that ultimately limit normal physiologic range of motion.
2. Relax reflexively contracted antagonistic muscles resisting motion.
3. Provide psychological reassurance to the athlete through the “laying on” of knowledgeable hands.
Knee Mobilization Techniques

As John and Mennell (12) have succinctly stated, "the proper use of mobilization hastens healing, reduces disability, relieves pain and usually restores full range of motion." An illustration of basic mobilization techniques for the stiff, motion-limited post-surgical knee seen in sports medicine is presented below.

The post-operative knee will often demonstrate a characteristic position of comfort with the joint held in slight flexion. This position can rapidly become a posture of motion limitation (2). Pain frequently will be provoked at or near the end of the limited available range of motion as adhesions in the joint capsule, retinaculum or supporting ligaments are placed on stretch as full extension is attempted. Pain-provoked reflexive antagonistic muscle contraction can further interfere with attempts to restore motion. A vicious cycle is initiated, which can greatly complicate recovery and may ultimately compromise the athlete’s return to competition.
Examination of the joint should precede each mobilization session in order to assess response to treatment. Which accessory motions remain compromised can be determined by comparison to the uninvolved limb. Flexion and extension of the knee is accompanied by component motions involving the patella, tibia and fibula (Table 4). Joint play should also be carefully noted. Lack of passive mobility in any one of these components can also block the attainment of full motion.

After identifying the structures responsible for restricted motion, the surrounding soft tissues may be prepared for treatment through the use of superficial or deep thermotherapy (3, 6, 11). Connective tissue extendibility can also be facilitated through the use of ultrasound applied to the joint (3, 5, 6, 11). With the athlete relaxed and neighboring joints adequately stabilized, long-axis traction may be applied to the joint whenever feasible to facilitate the initial mobilization efforts. Mobilizations directed at the specifically identified accessory motion restrictions and in accordance with the “Concave-Con-
vex Rule” can then be applied for approximately 20-60 seconds and repeated no more than four to five times per session with a short pause between techniques dependent upon patient response (1). The athlete can then attempt to reinforce the increased freedom of movement gained through this “knowledgeable stretching” by performing physiological range of motion exercise. Other techniques indicated for non-capsular, muscle-tendon restrictions (i.e., PNF, Hip Sled or static traction) can be added as indicated when accessory motion restrictions are eliminated.

The key to the initial restoration of knee motion is mobility of the patella. Figures 4a-d illustrate the patella being glided to gently stretch the quadriceps expansion and retinaculum. Varus and valgus stress to the knee at or near full extension (Figure 5) should result in a slight (less than 1 millimeter) opening. Traction may be applied to the knee joint in a number of ways: via long axis distraction (Figure 6a), utilizing a system of levers (Figures 6b and c), with body weight (Figure 6d), or with the assistance of a second person (Figure 6e), to facilitate early mobilization sessions.

Superior and inferior mobilization of the fibular head occurs through its relation with the ankle. Inversion and eversion of the talo-crural joint produce a complimentary long axis fibular glide (Figures 7 and 8). Anterior posterior movement of the fibular head can be accomplished by grasping it between the thumb and index finger (Figure 9a) or utilizing the thenar eminence with the knee in various positions (Figures 9b and 9c). This is essential to gain full knee extension.

Mobilization of the tibia proceeds in accordance with the “Concave-Convex Rule.” Motion of a concave surface segment (i.e., the tibia) occurs in the same direction as the desired motion increase (Figures 10a, b, c), such that the tibia is mobilized anteriorly to increase extension and posteriorly to improve flexion at several points in the available range of motion. Conversely, the tibia may be fixed (Figures 10d and 3) and the femur mobilized on it in the opposite direction of desired motion. Occasionally collateral ligaments will adhere to the underlying periosseum of the femoral condyle and require transverse friction massage in addition to mobilization (Figure 11). A detailed description of this technique can be found in the writings of Cyriax (2, pp. 19-20).

Objective improvement should be noted after each mobilization session. Changes in accessory motions and concomitant physiologic range of motion should be recorded and compared. If an athlete goes more than two or three treatment sessions without improvement, a critical reassessment of technique is necessary. Lack of documented progress over a two-week period should be considered a treatment failure (1) and warrant consultation with the referring physician. You must keep in mind that some knees, in spite of heroic efforts, “can’t move” due to massive adhesion formation. Frustrating attempts in the face of objective evidence of failure can only delay required definitive intervention and potentially contribute to articular surface damage.

In conclusion, this paper has presented an introduction to the concepts of joint mobilization and provided an example of how the technique can be applied to the motion-restricted post-surgical knee. We hope that you will pursue the study of mobilization, its theory and application, to enhance the treatment of joint movement restrictions encountered in sports medicine.

References

Table 1*

<table>
<thead>
<tr>
<th>Traditional Physiological Movement Technique (Stretch)</th>
<th>Accessory Movement Technique (Mobilization)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Used When Muscular Resistance is Encountered</td>
<td>- Used When Ligament or Capsule Resistance is Encountered</td>
</tr>
<tr>
<td>- Effective Only at the End of the Physiological ROM</td>
<td>- Can be Performed at Any Point in the ROM</td>
</tr>
<tr>
<td>- Limited to One Direction</td>
<td>- Can be Done in Any Direction</td>
</tr>
<tr>
<td>- Increased Pain with Increased ROM</td>
<td>- Decreased Pain with Increased ROM</td>
</tr>
<tr>
<td>- Used for Tight Muscular Structures</td>
<td>- Used for Tight Articular Structures</td>
</tr>
<tr>
<td>- Safety—Employs Long Lever Arm Techniques</td>
<td>- Safer—Employs Short Lever Arm Techniques</td>
</tr>
</tbody>
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*Modified from Barak, Rosen and Sofa (1).

Table 2*

<table>
<thead>
<tr>
<th>Joint Status and Indications for Mobilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain Felt Before Resistance To Motion</td>
</tr>
<tr>
<td>Pain Felt When Resistance is Encountered</td>
</tr>
<tr>
<td>Resistance Encountered Before Pain Felt</td>
</tr>
</tbody>
</table>

*Adapted from Paris (10)

Table 3*

<table>
<thead>
<tr>
<th>Contraindications for Mobilization</th>
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<tbody>
<tr>
<td>ABSOLUTE</td>
</tr>
<tr>
<td>- Premature Stress to</td>
</tr>
<tr>
<td>- Specific Surgically Repaired/Reconstructed Structure</td>
</tr>
<tr>
<td>- Acute Stage of Inflammatory Reaction</td>
</tr>
<tr>
<td>- Infection</td>
</tr>
<tr>
<td>- Advanced Osteoarthritis</td>
</tr>
</tbody>
</table>

*Modified from Barak, Rosen and Sofa (1)

Table 4*

<table>
<thead>
<tr>
<th>Physiological Knee Movement and Component Motions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moving Into Extension:</td>
</tr>
<tr>
<td>- tibia moves forward on the femur</td>
</tr>
<tr>
<td>- tibia externally rotates on femur near terminal extension</td>
</tr>
<tr>
<td>- lateral ligaments tighten at approximately 30 degrees short of extension</td>
</tr>
<tr>
<td>- fibula slides superiorly</td>
</tr>
<tr>
<td>- posterior portion of the medial collateral ligament tightens</td>
</tr>
<tr>
<td>- patella slides superiorly</td>
</tr>
<tr>
<td>Moving Into Flexion:</td>
</tr>
<tr>
<td>- tibia eases out of externally rotated “screw home” position</td>
</tr>
<tr>
<td>- patella slides inferiorly</td>
</tr>
<tr>
<td>- tibia moves posteriorly on femur</td>
</tr>
<tr>
<td>- anterior portion of medial collateral ligament tightens</td>
</tr>
<tr>
<td>- with increasing flexion tibia slides forward</td>
</tr>
</tbody>
</table>

*Adapted from Kapandji (4) and Paris (10)


Note: The views expressed in this article are those of the authors and do not reflect the official policy or position of the Department of the Navy, Department of Defense, nor the U.S. Government.
The Athletic Training Major: A Plan for Systematic Development

Dale A. Rudd, MS, ATC
Thomas J. Templin, PhD
Todd A. Toriscelli, MA, ATC

Abstract

The National Athletic Trainers Association has mandated that all approved undergraduate athletic training curriculums be a formal academic major or its equivalent. A systematic approach toward achieving the successful conversion of an athletic training emphasis, concentration, option, or minor to an academic major is presented. Determining the need and feasibility for the major, curriculum self evaluation, assessment of the curricular process, and personnel utilization are discussed. With each aspect of the process, potential problem areas are exposed and practical solutions are offered. Strategies pertaining to garnering administrative support and anticipating problems are offered.

In June of 1982 the National Athletic Trainers Association’s (NATA) Professional Education Committee announced important deadlines for those universities with approved undergraduate athletic training curriculums (5). By July 1, 1986 all approved curriculums had to be in the process of developing an academic major or its equivalent, and this must be followed with full implementation of the major by July 1, 1990.

The intent of this paper is to provide a systematic approach toward achieving the successful conversion of an athletic training emphasis, concentration, option, or minor to an academic major. In addition, those involved with changes in their internship programs might gain from this information as well. This will be based on the lead author’s experience in directing NATA-approved curriculums at three separate universities, achieving major or equivalent status at all three, and the coauthor’s experience in dealing with curriculum development. The perspectives given are those that have been viewed successful by the authors with the hopes that they will aid the sixty or so curriculums that are striving to achieve academic major status for their athletic training education programs (6). While the various programs must adhere to basic guidelines set forth by the NATA, they are all subject to institutional policies and procedures. Colleges and universities insist on institutional autonomy and do not like to be influenced by outside agencies; therefore, this is not meant to be a “how to” type of article, but rather a sharing of experiences so that others in similar situations might benefit.

The formulation of the academic major should be looked at in an orderly manner; hence, the following topics will be covered: the need and feasibility for the major, self evaluation, assessment of the curricular process, doing your homework (including garnering support and neutralizing opponents), assessing personnel needs, and anticipating implementation problems. Throughout the paper, related strategies and possible pitfalls will be discussed.

The Need and Feasibility for the Major

Initially, the question of need arises. One must ask, is there a need for the major at your university? This question is asked by the NATA when considering programs for initial approval and for re-approval. The need is usually supported by giving regional, real, or projected employment opportunities, documentation of significant student interest, and possibly past enrollment and graduation figures. If there are several athletic training majors in the same geographic area, few employment opportunities, or few students who will benefit from or are interested in the athletic training program, there is little need for an athletic training major at your institution. The need must be demonstrated! We found that program data, pertaining to former students’ employment rates, is influential. The reputation of the athletic training program also proves to be a positive factor in promoting the major. Furthermore, it was pointed out that national approval would not be granted if major status were not achieved. As one might suspect, this was not seen as desirable by supportive faculty and administration. In addition, it was shown that recent growth of interest in the program could raise enrollment.

Problems

The first problem might be that the program is not large enough to justify a major. As long as a program has more than one certified athletic trainer and appropriate clinical or laboratory space, the first compromise might be to expand the program to include more students. Justifying a major with only eight to ten students is difficult. Most athletic training curriculums are housed in departments of physical education, which are currently undergoing curricular changes to meet new and different demands of the market. By expanding a program to the upward limits of acceptable clinical instructor-student trainer ratio of the NATA (6-8 students per certified trainer in the clinical setting) one would have a very strong base from which to increase credit hour production. This is the bottom line for many administrators. Perhaps then, it is easier to change a curriculum when 1) the home department is changing, and 2) one can insure increased enrollments. In all three curriculum programs with which the lead author has had experience, enrollment was increased because of the...
implemenation of NATA Approved Undergraduate Ath­

It is also strongly recommended that courses in chemistry, physics, pharmacology, statistics, and research design be included (2).

Next, one should look at the Competencies in Athletic Training (4) which are derived from the Role Delineation Study (2). A determination should be made as to where each competency is going to be presented in the curriculum. The question is: Can the existing programs format accommodate the above, or must changes be made? In some instances, existing course work can be modified to accommodate the pre-determined changes. On the other hand, the old curriculum format (Guidelines for Development and Implementation of NATA Approved Undergraduate Athletic Training Programs 1980) of one basic course and one advanced course in athletic training cannot meet the present guidelines (1). By utilizing the Guidelines, Role Delineation Study, and Competencies, one should be able to analyze the current curriculum content and format, and determine the changes that are necessary (2,3,4).

The changes and additions to formal classroom instruction should be a complete package, having as goals the completion of a degree, preparation for the certification exam, and entry into the job market or graduate study. Make sure to explore how many credit hours are necessary for a major in your department or school. If a curriculum lacks units for being a major or equivalency, consider offering credit for the clinical experience. The NATA encourages this, considering the amount of time students put into this aspect of the program. This type of credit was helpful at Purdue in justifying to the department faculty the time spent in the clinical setting. If you find that you have too many units to be considered a major at your institution, then two avenues can be considered: First, a course or two that are required might be considered as strongly suggested electives, thus bringing the major into line. If this is not possible there are probably examples on campus where a given major has been allowed to exceed the magic number. Using precedence can be helpful in this case, but it is better to stay within the normal academic standards of a university.

Assessment of the Curricular Process

Each department, school, or university has its own manner of proposing new academic coursework or programs. Make it a point to familiarize yourself with curricular procedures. Several resources are available to help in this. Seek out the person or persons that have had the most experience in dealing with the curricular process in your department. This person can be invaluable in giving advice on presenting materials, prevailing attitudes concerning new programs, and what the committees are apt to accept or reject. Also, talk informally to the chairperson of your department, section, and/or school curriculum committee. This person should be able to delineate the time table for the sequence of material presentations at the various levels. For instance, at Purdue University the process for curricular change is as follows:

1. Presentation, discussion, and approval by physical education section faculty
2. Presentation, discussion, and approval by PEHRS (dept.) curriculum committee
3. Presentation, discussion, and approval by PEHRS faculty
4. Presentation, discussion, and approval by School of Humanities, Social Science, and Education curriculum committee
5. Approval by School senate
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Knowing the process, its deadlines and idiosyncracies can save time and potential headaches. Our experience shows that it is usually easier to gain acceptance for packages rather than single elements of a program. In instances at two other universities, the athletic training program changes were part of larger curricular considerations within the department or school. The presentation of a larger package including substantive changes, versus presenting single elements, seems to be more impressive and appears to receive less overall scrutiny in the vertical process of approval.

**Doing Your Homework**

While becoming intimately familiar with the curricular change process is a part of being prepared, there are many ways to insure approval of your program changes. The first is to assess administrative support for your major. Administrative support is critical in the curriculum approval process. This support might be garnered through a promise of increased enrollments or it may be obtained by convincing the administration that such a program makes both theoretical and practical sense. Apprise the key administrator, department head and/or dean of the reasons for the necessary changes prior to the start of the approval process. In gaining academic major status for the program at Purdue, it was felt that having strong administrative support at the section, department, and school levels was a key element in the successful passage of the major proposal. This also included support from the dean and from the student hospital administration.

**Diagram 1 - Purdue University Selection Criteria**

1. Grade point average in the pre-athletic training year. Minimum g.p.a. considered is 4.75/6.00. Higher g.p.a. given stronger consideration.
2. Individual grades in anatomy, physiology, math, basic athletic training, first aid, and the first year clinical experiences are weighted.
3. State of residence. As a land grant institution this must be considered when qualified applicants exceed the number of spaces in the program.
4. Professional staff evaluation. The professional staff of athletic trainers and physical therapists will evaluate each student based on the clinical performance.
5. Personal interview with the Athletic Training Selection Committee.
6. Previous work experience in athletic training or related areas is evaluated.
7. Letters of recommendation are solicited.

**Assessing Personnel**

The suggestion of a new major will undoubtedly bring up the question of personnel. Administrators and curriculum committees are going to ask if the proposals necessitate an increase in personnel, which is interpreted as dollars. You must be prepared to show that 1) the program can be run by the current staff or 2) you have commitments from other existing personnel to aid in the instruction within the major. The first choice is a possibility, but may be unrealistic if your program has extensive offerings. The second option is more receptive and realistic. At Purdue the athletic training staff consists of three certified trainers, two physical therapists from the student hospital, the curriculum director,
and assistant curriculum director. This support from the department of athletics and the student hospital was imperative in being able to offer the seven new didactic and four new clinical courses. Prior to undertaking the process of formulating a major, Purdue hired the lead athletics as curriculum director, alleviating the busy head trainer of this responsibility. Recently, an assistant director has been hired with responsibilities in the athletic training curriculum as well as in recreational sports.

While all of this may seem ideal, there are other alternatives to staffing. At another university, the curriculum director desired time in the training room working with athletic teams and the head trainer had the desire to teach. A trade off in terms of time was worked out. Physical therapists, medical doctors and other allied medical specialists may be willing to help out either on a paid, part-time or adjunct basis. With such expertise and cooperation, staffing for the classroom can be worked out.

**Anticipating Implementation Problems**

By the time congratulations are in order with your new major in place, additional concerns have come up in the planning process. For example, any time a change in format occurs in a program, students are caught in the transition. Some students will want to switch to the new major. In this case, substitution credit must be worked out, old for the new coursework. Others are going to want to complete the program as they started and that option should be available to them. You will want to notify any areas that may incorporate a course or courses from the athletic training curriculum of any changes that may affect them.

Another concern relates to final admission into the major. Most athletic training programs have some sort of selection or screening process for entry into the program. Some of these procedures may be loose and subjective. When going to an academic major status at Purdue there was a lot of concern and interest in the selection process. With the program’s recognition as a major, instead of being a study emphasis, such scrutiny can be expected. The first hurdle encountered was the need for and legitimacy of a screening process. The need was justified in terms of NATA clinical instructor-student ratio and allotted laboratory space. We compared the program to other athletic training and physical therapy screening procedures. Examples from within Purdue were then given showing that other programs have screening or admittance procedures. Athletic training was to be viewed as a professional program similar to Pharmacy, Veterinary Medicine, Nursing, Management and others that had entrance requirements. (See Diagram 1)

Similar to the Schools of Pharmacy and Veterinary Medicine, the Athletic Training program doesn’t admit freshmen directly into the professional program. It was felt that screening at this level would be too difficult. Instead, interested students enter into a pre-professional year. They gain admission to this by meeting the School of Humanities, Social Science, and Education requirements. During this pre-professional year the students will take suggested course work from School core requirements and athletic training prerequisites. (See Diagram 2) In addition, they gain hands on experience through exposure to clinical settings. The pre-professional year is seen as serving two useful purposes: 1) it allows the students to see first hand if this is what they want to do and to see if they can handle the time management that is necessary to be a student athletic trainer, also 2) it allows for a period of evaluation of the student by the professional staff. Near the end of this pre-professional year, the student is evaluated formally by an athletic training admissions committee. Only those students selected will be allowed to move into the professional phase of the program and major in athletic training. The criteria for selection was carefully developed and made as objective as possible. Students are made aware of the selection criteria, but not the weighting of the criteria.

Finally, you will want to publicize your new major. Thought should go into the possibility of having brochures made up and sent to inquiring students. Perhaps a mail campaign to area high schools can be undertaken. Make sure university forms and documents list your major as a choice. Most all colleges and universities have departments whose responsibility is to make known achievements such as a new program. Seek the help of these groups. It might be worthwhile to notify the program alumni of the exciting changes.

**Summary and Conclusions**

The approval of the athletic training major at Purdue was accomplished in five months. This was due in part to the program director’s previous experience in setting up similar programs at other universities, tremendous administrative support, and finally meticulous preparation. While this process will not always proceed with such expediency (it has taken as long as two years) it is hoped this article will expedite matters for those interested in designing and implementing new programs.

If one accurately assesses the possibility of creating the athletic training major, has in place or can create new course work to cover the appropriate subject matter areas, and has a thorough understanding of the curricular process at their university, work can be initiated. Next, through doing your homework, justify your position and anticipate problems. Overwhelm those that will be scrutinizing the proposal with preparedness. This eliminates many questions and quickly handles those that are asked. Be sure to know who is going to support your efforts and those that may oppose it, including administration and faculty. Be sure you can answer questions regarding money, personnel, and the effect of the program on other areas.

Many of the above suggestions were the result of trial and error at the hands of the authors. If we had to do it over again we would have been grateful for much of the information contained herein. We look forward to our new major and the many students who aspire to enter the profession of athletic training.

**References**


4. National Athletic Trainers Association: Competencies in continued on page 166
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Male and Female College Athletes: Prevalence of Anorexia Nervosa and Bulimia Nervosa

Mardie E. Burckes-Miller, EdD, ATC
David R. Black, PhD

Abstract

This study surveyed male and female athletes from 22 midwestern colleges and universities regarding the prevalence of anorexia nervosa and bulimia nervosa. The response rate was 66.0%; 695 athletes completed questionnaires. The data were analyzed according to the criteria for eating disorders listed in the Diagnostic and Statistical Manual of Mental Disorders III-R (DSM III-R). Twenty-one athletes (3.0%) met the criteria for anorexia nervosa and 195 (21.5%) met the criteria for bulimia nervosa. The prevalence of eating disorders among college athletes in this study was higher than that reported for college and noncollege populations. It is unclear, however, whether a person with an eating disorder engages in athletics or whether athletics contributes to the development of an eating disorder. Suggestions were offered for athletic trainers, coaches, and those working closely with athletes to help athletes participate in sports in ways that are physiologically and psychologically healthy.

Eating disorders are related to significant health problems in American society and studies show that the prevalence of anorexia nervosa and bulimia nervosa has increased in recent years (15). Sports participation may contribute to the increased incidence and specifically to the development of eating disorders among athletes (26). It has been noted that almost all athletes at some point in their careers are concerned about controlling their body weight (22). Weight loss or gain is a beneficial and appropriate part of a well-designed athletic training program. Concern arises, though, when athletes maintain their weight below desirable levels or attempt to lower their body weight rapidly (18, 20, 21). Athletes who lose weight rapidly or maintain very low body weight may develop an eating disorder that may adversely affect weight regulation (5) and athletic performance. An athlete with an eating disorder and a person diagnosed with an eating disorder may experience different situations that trigger drastic weight loss but the underlying mental states appear to be similar (10) and an athlete involved in vigorous training who severely restricts food intake may not be labeled as eating disordered but may be indistinguishable from an eating disordered person who engages in athletics to achieve and maintain an excessively low body weight (14, 16).

The purpose of this study was to identify male and female college athletes who satisfy the criteria for anorexia nervosa or bulimia nervosa based on the latest revision of the Diagnostic and Statistical Manual of Mental Disorders III-R (DSM III-R) (2). Differences between sexes were also noted. In addition, the study was conducted to alert those working with athletes to the prevalence of anorexia nervosa and bulimia nervosa among college athletes.

Methods

We developed a four-page, 41-item questionnaire titled “Eating Habits of Athletes” (EHA) (available from MERM) because published questionnaires did not focus on athletics or on estimating the prevalence of anorexia nervosa and bulimia nervosa according to the medical criteria for an eating disorder. The Diagnostic and Statistical Manual of Mental Disorders III (DSM III) (1) was used to develop items for the EHA questionnaire. Table 1 lists the criteria for anorexia nervosa and bulimia nervosa and the specific items or responses used to estimate prevalence. DSM III-R (2) criteria were used to analyze the data because they are the latest standard used to diagnose eating disorders. The only item added to the new criteria that was not in DSM III (1) was amenorrhea which pertains only to females or about half (55.0%) of this sample.

Readability, response bias, test-retest reliability, and content and criterion validity were estimated for the EHA questionnaire (3, 17). Two groups of 10 college students completed the questionnaire and offered written and verbal feedback to evaluate readability. We revised the questionnaire based on the students’ suggestions. An additional 30 students in a health education class completed the questionnaire to estimate response bias. Analysis of each item indicated that respondents answered the items candidly rather than in a socially desirable way. After administering the test to 30 students on two occasions approximately three months apart, the Kendall rank-order correlation indicated that test-retest reliability was acceptable [r (28) = .81, p < .0001]. Criterion validity was estimated by weighing and recording the height of the 30 students and comparing these values to the height and weight reported on their questionnaires. The Pearson product-moment correlation indicated a highly significant relationship between actual and reported height and weight [r (28) = .98, p < .001, respectively] and that criterion validity was acceptable for both measures.

The percentage below ideal weight was also calculated for each athlete based on self-report of height and
weight. Subjects specified their body weight by selecting a weight within a four-pound range. Actual weight was considered in the middle of the range and ideal weight was defined as the average weight for the medium frame size for each height specific to gender reported in the 1983 Metropolitan Life Insurance Company Tables (25). This table was used because a telephone poll by the authors indicated that five major eating disorder clinics

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**Table 1**
Eating Disorder Criteria (DSM III-R) and Items from the “Eating Habits of Athletes” Questionnaire

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Item/Response</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anorexia Nervosa</strong></td>
<td>Circle your exact height and weight</td>
</tr>
<tr>
<td>Refusal to maintain body weight over a minimal normal weight for age and height, e.g., weight loss leading to maintenance of body weight 15% below expected; failure to make expected weight gain during period of growth, leading to body weight 15% below ideal.</td>
<td>1. 4'9&quot; 2. 4'10&quot; 3. etc.</td>
</tr>
<tr>
<td>Intense fear of becoming obese, even when underweight.</td>
<td>I think about food and becoming fat all the time.</td>
</tr>
<tr>
<td>Disturbance in the way in which one’s body weight, size, or shape is experienced, e.g., the individual claims to “feel fat” even when emaciated, believes that one area of the body is “too fat” even when obviously underweight.</td>
<td>I think I am fat although I am not and have lost weight.</td>
</tr>
<tr>
<td>In females, absence of at least three consecutive menstrual cycles when otherwise expected to occur (primary or secondary amenorrhea). A woman is considered to have amenorrhea if her periods occur only following hormone (e.g., estrogen) administration.</td>
<td></td>
</tr>
</tbody>
</table>

| **Bulimia Nervosa** | |
| Recurrent episodes of binge-eating (rapid consumption of a large amount of food in a discrete period of time). | I eat large quantities of food in a short period of time. OR Sometimes I eat a large amount of food at one sitting. |
| During the eating binges there is a feeling of lack of control over the eating behavior. | There are times I am afraid I can not voluntarily stop eating. OR I get uncontrollable urges to eat and eat until I feel physically ill. |
| The individual regularly engages in either self-induced vomiting, use of laxatives, strict dieting, fasting, or vigorous exercise in order to prevent weight gain. | Mark the following methods you have used for weight control: 1. self-induced vomiting 2. laxatives 3. etc. |
| A minimum average of two binge-eating episodes per week for at least three months. | What is the average number of days between your eating binges: 1. 1-2 days 2. 3-5 days 3. etc. |
| Persistent overconcern with body shape and weight. | I think about food and becoming fat all the time. OR I think I am fat although I am not and have lost weight. |

**Note.** Respondents had to answer one item under each criteria in order to meet the criteria for anorexia nervosa or bulimia nervosa.

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The results of this study and others suggest that the role of athletics in the development of an eating disorder is unclear. What seems to be at issue is the causal link as to whether athletics amplifies an already existing predisposition or athletic participation results in the development of an eating disorder. Sours (23) reported a direct parallel between running and anorexia nervosa and that 65% to 75% of human anorexia may be activity induced. Katz (12) also suggested that extreme exercise such as long distance running can serve as a trigger for eliciting anorexia nervosa in persons who are at risk psychologically and biologically for developing an eating disorder. Yates et al. (26) reported that a subgroup of male athletes designated as “obligatory runners” resembled anorexic women in family background, socioeconomic class, and personality characteristics such as inhibition of anger, extraordinary high self-expectations, tolerance of discomfort, denial of potentially serious disability and a tendency towards depression. Further research is needed to determine the role of athletics in the development of an eating disorder.

The findings and issues raised by the study might be challenged because of problems related to implementation. The response rate might be questioned; the possibility of bias is acknowledged because presumably, respondents with socially unacceptable behaviors and attitudes would be less likely to complete the questionnaire. If this is true, the results are even more dramatic than reported because the study underestimates the number of athletes who actually meet the criteria for eating disorders. On the other hand, the response rate may be an accurate estimate. Fairburn and Cooper (7) reported after interviews with bulimic patients that they would have cooperated with epidemiological research. Also, in an absolute sense, the response rate is fairly high; two out of every three participants returned the questionnaire. The response rate is also equivalent to other published studies in which surveys were mailed to a college population to estimate the prevalence of an eating disorder (8,9).

The data suggest an immediate call for action. The alarming fact is that young athletes may only need one or two suggestions about reducing body fat before they begin maladaptive eating behaviors (10,27). Given a combination of family, interpersonal and behavioral characteristics, some athletes could develop aberrant eating patterns. If the results of these abnormal eating patterns (i.e., self-induced vomiting, low body weight) are reinforced by coaches, peers, and by athletic successes, the patterns are likely to continue (14). It seems appropriate that athletic trainers, coaches, and others working closely with athletes be taught how to identify the signs and symptoms of eating disorders and how to help eating disordered athletes.

There are practical implications from the study for college athletes and those working with them. First, attention needs to be paid to unusual habits related to food and weight. The table presented in this article might serve as a guideline for the types of behaviors or statements that would be associated with the diagnosis of eating disorders. Second, frequent weighing of the athlete is important in order to monitor rapid weight changes and to help detect the use of inappropriate weight loss methods. Private weigh-ins are also recommended to reduce the stress, anxiety, and embarrassment of public weighing, especially for athletes with eating disorder symptoms (24). Third, athletes with suspected eating disorders should not be pressured to gain or lose weight. It is important that eating disorders are not just “weight problems” but are related to basic feelings about self-worth. Fourth, referral...
to an eating disorder specialist such as a sports psychologist, health educator, or others needs to be done without reprisal or loss of team position. Athletes may require reassurance and it may be best to refer them for an 'assessment' rather than for 'therapy' by an eating disorder professional. Fifth, as a preventative measure, college athletes might be required to attend health education classes that focus on proper nutrition, a prudent diet, the potential negative consequences of using eating disorder weight loss methods, and the appropriate use of weight management techniques.

In summary, further research needs to be conducted to understand the reasons for the seemingly higher prevalence of eating disorders among college athletes compared to the general population and whether these problems can be ameliorated to prevent further jeopardy of athletes. Longitudinal studies are needed before conclusions are reached about the relationship between athletic participation and the development of an eating disorder. It is important that athletic trainers, coaches, and those working closely with athletes be cognizant of their roles and responsibility to help athletes participate in sports in ways that are physiologically and psychologically healthy.

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Composition of Training Table Selections In A Group of Male University Athletes

Linda H. Eck, MS, RD
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Robin R. Roach, MPH, RD
Frank Rosato, PhD
Lillian Fox, MA

Abstract

Training table selections of members of a university football team were observed for three days. These selections were analyzed for the percentage of kilocalories derived from fat, carbohydrate, and protein. The average composition of the training table selections in this group of athletes was found to be 34.7% carbohydrate, 17.0% protein, and 48.2% fat. This composition differs greatly from the currently recommended composition of 50-55% carbohydrate, 10-20% protein, and 30-35% fat and may have negative implications for the future health of this group. These athletes were also questioned regarding their sources of nutrition information. Popular magazines, newspapers, and athletic trainers were most often reported as nutrition information sources. Educational background in nutrition was low in this group. Results of this study indicate that health professionals working with athletes may need to focus on providing reliable nutrition education geared to the specific interests and needs of this group.

With their interest in enhancing performance, athletes may be more open to nutrition advice than most students. During the competition years, the athletic training staff provides guidance to the athlete both in athletic endeavors and health concerns (7). While health professionals generally assume that the diet of the athlete is less than optimal, this is not well substantiated by research (5). Those studies assessing the dietary intake of athletes have yielded conflicting results (11,13,14,16,19). The professionals involved with the athlete will be better able to provide nutrition advice if they have accurate information concerning the intake of athletes.

While it appears that athletic trainers are disseminating nutrition advice (7), the question of other sources of nutrition information for the athlete also exists. Because there are so many potential sources it would appear useful to question athletes as to where they have received nutrition information. A recent study (15) found parents, high school and college Health classes, high school coaches and Home Economics courses to be the major sources of nutrition information in a group of college athletes. However, in that study athletic trainers were not listed as a possible choice.

The purpose of this investigation was to identify the composition of the diet chosen by a group of football players when they were given free choice from a large selection of foods. Further, an attempt was made to identify the sources of formal and informal nutrition information for these athletes.

Methods

Forty-three members of a university football team participated in this study. This group was comprised of 20 blacks and 23 caucasians and was made up of all levels of the student body (10 freshmen, 10 sophomores, 17 juniors and 6 seniors). Positions played by the players included defensive backs (DB), defensive linemen (DL), linebackers (LB), offensive linemen (OL), quarterbacks/kickers (QB/K), and offensive backs (OB). Height of the sample ranged from 68 to 78 inches with a mean of 73.3 inches (SD = 2.1). Weights ranged from 169 to 303 pounds with a mean of 224.6 pounds (SD = 34.2).

A questionnaire was developed to assess both formal and casual sources of nutrition information for these athletes. Choices of education sources of nutrition information were limited to the high school and college levels. Although many persons receive nutrition education prior to high school, the time elapsed since that instruction was regarded as too great to be considered in this survey.

Because those in the medical community are considered to be the best sources of nutrition information, physicians/nurses and registered dietitians were listed. Since athletes consult coaches and athletic trainers for health advice, each was listed separately. With the increasing public interest in nutrition, the media has become a major source of nutrition information. The media was separated into the printed media (popular magazines, newspapers) and the spoken media (radio/TV). It was assumed that university athletes would not peruse professional journals and might confuse them with popular magazines, so journals were not listed as a possible choice.

Recent interest in nutrition and health has also led to a large increase in the number of health spas and health food stores. Employees of these establishments may be viewed as health and nutrition experts by the public and were included as a possible source. Nutrition information is often derived on a casual basis from those closely related to the athlete. For this reason, parents and friends were each listed as possible choices.

To most accurately assess the dietary intake patterns of this group, permission was obtained from the coaching and athletic training staff to directly observe three days of food intake. Most of the methods previously used with athletes (11,13,14,16) have relied upon the subjects' willingness to record or recall one or more days of food intake. While such methods may be easier to gather, these researchers reasoned that those methods would be less likely to produce a reliable estimate of the kinds and amounts of food eaten by this group of male athletes.
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Direct observation was possible since a training table is provided for all male athletes at this university. This training table is housed in a cafeteria which is open only to male athletes. A wide variety of food is available at each meal with players making their selections from a cafeteria line. While standard portions are served, players are encouraged to request additional servings when desired.

Before these observations were performed, menus and recipes for the observation days were obtained. Serving sizes of all foods and beverages were also collected. When necessary, samples of the foods and beverages were weighed or measured. This enabled the researchers to develop check lists of the food and beverages available at each meal.

Observers were trained in advance of the observation days. Each was made aware of foods and serving sizes which would be available and trained to accurately record all selections. For some foods (e.g., salads, margarine, etc.) it was necessary to train observers to make quick estimations of serving sizes.

At least four observers were always present during the actual observation of meals. A supervisor was present at all observations and responsible for observer training. The athletes involved in the study had previously been instructed to select those foods and beverages that would normally be a part of their meal pattern. It was stressed that the study was only seeking to examine the usual intake of athletes and not to make judgements regarding individual selections. They were also instructed to pass by the observation table, give an observer their previously assigned subject number and allow the observer to record all selections. They were to return to the observation table when finished so that plate waste could be observed and recorded. Players were cooperative and did not seem to consider the presence of the observers to be an intrusion. After collecting the dietary data, all diets were analyzed with a computerized nutrition analysis program, Nutritionist II (12).

Only players who consumed at least half of the meals served in the athletic cafeteria on the three observation days were included in the analysis. Because of the care taken to be unobtrusive (and therefore to collect a more "normal" dietary intake) athletes were not required to consume all foods in the cafeteria. While this practice eliminated the possibility of defining the total diet, it was felt to be the most appropriate for this group. The accuracy of recall information would be questionable and might decrease the accuracy of the observations. This decision resulted in a sample of 41 for the nutrient composition portion of this study.

Results

Forty-two of the 43 team members in the sample group were present to complete the questionnaire covering sources of nutrition information. Results are outlined in Table 1. On Section I (covering educational background in nutrition) a large number of the sample (33%) reported receiving no nutrition education at the college or high school level.

Sources of nutrition information reported were widely distributed among the choices offered, with most athletes choosing more than one source. Athletic trainers were chosen by the largest number (50%) of the athletes with popular magazines and newspapers a close second, being chosen by 48%. All other sources were chosen by some of the sample with the more technically knowledgeable sources chosen by the smallest percentage of the group. Twelve percent reported receiving information from physicians/nurses, while only one athlete had received nutrition information from a registered dietitian.

Since two athletes failed to consume more than 50% of their meals at the training table, only 41 of the sample group were used in this analysis. Results of the observation of dietary intakes of each sub-group of the sample are included in Table 2. Each diet was analyzed for percentage of kilocalories obtained from each energy nutrient (i.e., carbohydrate, fat, and protein). Total kilocalories and other nutrients are not included since the possibility exists that additional food intake could have occurred outside the athletic food service.

The average diet composition of the entire sample for selections made at the training table for the observation period was 48.2% fat, 17% protein, and 34.7% carbohydrate. Inspection of Table 2 illustrates that the intake of the sample group was quite different from the current...

### Table 1
Players Selecting Each Source of Nutrition Information

<table>
<thead>
<tr>
<th>Source</th>
<th>Number of Players Selecting Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section I:</td>
<td></td>
</tr>
<tr>
<td>Nutrition course in high school</td>
<td>14</td>
</tr>
<tr>
<td>Nutrition course in college</td>
<td>1</td>
</tr>
<tr>
<td>Nutrition as part of another course in college or high school</td>
<td>10</td>
</tr>
<tr>
<td>Nutrition not included as part of any course</td>
<td>17</td>
</tr>
<tr>
<td>Section II:</td>
<td></td>
</tr>
<tr>
<td>Popular magazines/newspapers</td>
<td>20</td>
</tr>
<tr>
<td>Radio/TV</td>
<td>17</td>
</tr>
<tr>
<td>Physician/nurse</td>
<td>5</td>
</tr>
<tr>
<td>Registered dietitian</td>
<td>1</td>
</tr>
<tr>
<td>Coaches</td>
<td>17</td>
</tr>
<tr>
<td>Athletic trainers</td>
<td>21</td>
</tr>
<tr>
<td>Parents</td>
<td>16</td>
</tr>
<tr>
<td>Friends</td>
<td>17</td>
</tr>
<tr>
<td>Health spa or Health foot store staff</td>
<td>9</td>
</tr>
</tbody>
</table>

*n=42, most chose more than one source on Section II

### Table 2
Composition of Dietary Selections and Comparison to Recommendations (Mean ± SD)

<table>
<thead>
<tr>
<th>Group (n)</th>
<th>% Fat ± SD</th>
<th>% Protein ± SD</th>
<th>% Carbohydrate ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offensive Backs (8)</td>
<td>49.8 ± 5.0</td>
<td>16.8 ± 2.0</td>
<td>33.6 ± 6.5</td>
</tr>
<tr>
<td>Offensive Linemen (7)</td>
<td>47.2 ± 6.3</td>
<td>16.4 ± 2.6</td>
<td>36.3 ± 7.1</td>
</tr>
<tr>
<td>Quarterbacks/Kickers (6)</td>
<td>47.7 ± 5.7</td>
<td>17.3 ± 1.6</td>
<td>35.2 ± 6.4</td>
</tr>
<tr>
<td>Linebackers (8)</td>
<td>44.5 ± 2.6</td>
<td>16.6 ± 1.2</td>
<td>38.8 ± 1.7</td>
</tr>
<tr>
<td>Defensive Linemen (6)</td>
<td>51.0 ± 4.6</td>
<td>16.8 ± 1.0</td>
<td>31.7 ± 4.8</td>
</tr>
<tr>
<td>Defensive Backs (6)</td>
<td>50.0 ± 2.4</td>
<td>18.3 ± 2.0</td>
<td>31.7 ± 8.2</td>
</tr>
<tr>
<td>Sample Mean (8)</td>
<td>48.2 ± 5.2</td>
<td>17.0 ± 1.9</td>
<td>34.7 ± 5.9</td>
</tr>
</tbody>
</table>
*Recommended: 30-35% Fat, 10-20% Protein, 50-55% Carbohydrate

**Ranges**

*See References 4, 21
recommendations to consume a diet composed of 50-55% carbohydrate, 10-20% protein, and 30-35% fat (4,21).

Discussion/Implications

Since nutrition courses are not required with most academic majors, it is not surprising that only one of the athletes had taken a nutrition course at the college level. Even though nutrition is often a part of other courses (health, physical education, biology), 48% of these athletes did not recall having nutrition as a part of any course in high school or college. This could mean that either: 1) nutrition was not a part of any of the courses they had taken, or 2) if presented, not remembered.

The majority of the athletes in this study chose athletic trainers and coaches as sources of nutrition information. Therefore, these groups would appear to provide the best avenue for disseminating nutrition information. Because of their availability and credibility, athletic trainers have an excellent opportunity to make an impact on the nutrition practices of athletes and to influence their future health by encouraging healthy behaviors. But, are athletic trainers prepared to provide accurate nutrition information to athletes? Although assessments regarding the level of nutrition knowledge held by athletic trainers are scarce, one study found them to have a very low level of nutrition knowledge (1). Further, the athletic trainers in that study accurately estimated their level of nutrition knowledge and felt that they needed more information.

It would appear that athletic trainers may need to obtain further training in nutrition or to enlist the aid of nutrition professionals in counseling athletes and/or establishing a healthy training table. Considering the rapid advances being made in the area of nutrition, the latter suggestion may be the most appropriate.

The results of the observed intakes in this group are quite poor and differ drastically from current recommendations (see Table 2). This type of intake may be typical of many male university athletes and is a cause for concern.

Although the percentage of kilocalories obtained from protein does not seem excessive in this group, it must be remembered that this type of athlete has been found (16) to be consuming very high levels of kilocalories. In the previous study (16) football players were found to be consuming a large number of kilocalories (mean of 4823 kilocalories for the defensive team and 4853 kilocalories for the offensive team) with a similar percentage of kilocalories (16%) derived from protein. If the total caloric intake for the athletes in the present study were similar, they would then be consuming an average of 196 grams of protein daily. With an average team weight of 94.7 kg., the mean value for the protein intake in the present study would be 2.07 grams of protein per kilogram of body weight. This amount exceeds even the most liberal estimate of protein needs for the growing athlete (4). Thus, these athletes may well be consuming an excessive amount of protein when the total intake is considered. While we did not attempt to define total intake, it seems reasonable to assume that these athletes are similar to those involved in previous studies.

The possibility of dehydration arising from excessive protein would be the most immediate problem in this group (20). However, the strain placed on the kidneys by an excessive amount of protein should also be considered (4).

Another concern is the large amount of fat found in many protein sources. It seems likely that this contributed to the high fat intake found in the present study. Diets high in fat have been correlated to an increased incidence of cardiovascular disease and some forms of cancer and to have an effect on immunological functioning (2,9,10). Emphasis on low fat protein sources is needed for this group. Although it is not always possible to show short term effects on performance, the long term effects of intakes high in fat and protein need to be emphasized.

In summary, it appears that this group of athletes is consuming a diet that may impair their future health. Further, they are deriving their nutrition knowledge from sources of questionable competency in the area of nutrition. There would appear to be a need for athletic trainers and health professionals dealing with athletes to attempt to provide those athletes with good information regarding their special nutrition needs.

References


continued on page 166
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Direct supervision of all practices and home events is impossible by one athletic trainer, especially with athletes practicing at many sites. Consequently, it is important that the athletic trainer be as accessible as possible to the groups of athletes at different sites. Direct two-way communication could greatly increase this accessibility; however, the use of a radio or a portable phone is too expensive and inconvenient to be a practical solution. A more reasonable and cost effective method is a liquid crystal read-out paging device (Figure 1). These devices can be purchased or rented on a monthly basis at reasonable cost.

Traditionally these pagers have been used to display a phone number to which a return call is to be made. Unfortunately this does not convey information such as urgency or location of the problem. At Highland Park High School we have made a small adaptation to the conventional use of these pagers. As the athletic trainer, I (CS) wear a pager which allows anyone familiar with our code to communicate a message to me. Our code utilizes a 10 digit display, as described in Table 1. Perhaps you can adapt it for your own use.

Our system relays information concerning the urgency of the message, exact location of the problem, and a phone number that may be called in return. The urgency and location information is contained in the first three digits, which appear as an area code. Whether to go directly to the site or to return the call to the remaining seven digit phone number is communicated by the first digit. The location of the problem is conveyed by the second and third digits.

In some cases of extreme emergency a caller has sent only the three digit code number, but we try to discourage this. For example, a pager display of 905-432-7651 tells the athletic trainer to go immediately to the boys pool due to an emergency. However, if the athletic trainer were delayed due to location, vehicle/traffic problems, etc., he/she could call 432-7651 and advise the caller to get help elsewhere or take other action.

A simple sheet describing the system should be explained to all coaches, managers and related personnel. It should be posted by all phones at athletic sites and reduced onto small cards for first aid kit and any other useful location.

The use of this paging system has proven to be quite helpful in more effectively supervising many different events occurring simultaneously.

### Table 1

<table>
<thead>
<tr>
<th>Sheet Posted at All Sites and in Training Kits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ATHLETIC TRAINER - PAGING SYSTEM</strong> Use the following procedures if you need the athletic trainer:</td>
</tr>
<tr>
<td>1. Determine degree of need: (This will be your first “area code” number)</td>
</tr>
<tr>
<td>9 come at once</td>
</tr>
<tr>
<td>8 come at once</td>
</tr>
<tr>
<td>7 come by end of day</td>
</tr>
<tr>
<td>2. Determine location of need: (This will be your second &amp; third “area code” number)</td>
</tr>
<tr>
<td>HPHS - Interior:</td>
</tr>
<tr>
<td>01 Exhibition Gym</td>
</tr>
<tr>
<td>02 Gymnastics Gym - boys’</td>
</tr>
<tr>
<td>03 Gymnastics Gym - girls’</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>04 Intramural Gym</td>
</tr>
<tr>
<td>05 Pool - boys’</td>
</tr>
<tr>
<td>06 Pool - girls’</td>
</tr>
<tr>
<td>07 Track</td>
</tr>
<tr>
<td>08 Training Room</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>3. Make sure you know the phone number where you are.</td>
</tr>
<tr>
<td>4. Activate the pager as follows:</td>
</tr>
<tr>
<td>a. Dial 707-6758</td>
</tr>
<tr>
<td>b. Wait for tone</td>
</tr>
<tr>
<td>c. Enter 10 digit number</td>
</tr>
<tr>
<td>Example: (Emergency in the boys’ pool would be 905-432-7651)</td>
</tr>
<tr>
<td>d. Push # button and hang up.</td>
</tr>
</tbody>
</table>

---

*Figure 1. A paging device is convenient and easily worn on a belt or pocket.*

*Chuck Schulte is head athletic trainer at Highland Park High School, Highland Park, Illinois.*

*John Gorleski is athletic director at Highland Park High School.*
Thoracic Injuries: Mechanisms, Characteristics, Management

Paul E. Widner, ATC

Abstract

In athletics, thoracic injuries occur mainly in contact sports. Thoracic injuries are classified as either external (bone, muscle) or internal (organ). External injuries usually result from direct trauma and include rib contusions, costochondral separations, sternoclavicular dislocations, sternal fractures, and rib fractures. Most external thoracic injuries are non-life threatening; however, the possibility always exists. Internal injuries are usually a result of external trauma and include pneumothorax, hemothorax, cardiac contusion, and traumatic asphyxia. Most internal thoracic injuries involve the heart and/or lungs, and require immediate medical attention. The athletic trainer must be aware of the mechanisms, characteristics, and management of various thoracic injuries in order to provide a correct and proper thoracic evaluation.

Introduction

When it comes to thoracic injuries many athletic trainers are not that cognizant of what they are. The thoracic area is a complex region which houses the vital organs. An athletic trainer must approach any thoracic injury with the thought of serious pathophysiological derangement (10). If disaster, due to simple failure to conduct a proper evaluation, is to be averted, full understanding of thoracic injuries must be the rule and not the exception. Since there are a number of possible thoracic injuries that can occur in athletics, this paper will identify some of the more common ones and address some of the ways to handle these injuries.

Anatomy

The chest, or thorax, is that area of the body which lies between the base of the neck and the diaphragm (4,8). The cavity is surrounded by a conical cage that is formed by the sternum and costal cartilages anteriorally, the ribs laterally, and the thoracic vertabrae posteriorly (6). This tough, protective structure prevents many potentially serious thoracic injuries. The 12 pairs of ribs attach anteriorally to the sternum and posteriorly to the thoracic vertabrae. Each of the upper 7 ribs attach directly to the sternum via a cartilage junction. These are known as true ribs. The 8th through the 10th ribs are termed false ribs because they attach indirectly to the sternum via the 7th rib cartilage. The 11th and 12th ribs do not attach to the sternum, they attach to muscles. These are termed floating ribs. Muscles of particular interest and importance are the pectoralis major, serratus anterior, latissimus dorsi, trapezius, rectus abdominus, external oblique, intercostals, and superficial back muscles (6). The major function of the bony cage and muscles is protection of the vital organs of respiration and circulation.

The thoracic cavity is divided into three separate cavities. The right and left pleural cavities contain the right and left lungs respectively. The middle cavity is called the mediastinum. The mediastinum contains the heart and great vessels, the thymus gland, the trachea, the right and left bronchi, the esophagus, the thoracic duct and other lymphatic vessels, and many nerves, arteries, and veins (6). The entire thoracic cavity is lined with the parietal layer of the pleura which adheres to the internal surface of the ribs and the superior surface of the diaphragm, plus the parietal layer partitions the mediastinum (3). A separate pleural sac encases each lung. Since the outer surface of each lung is covered by a visceral layer of pleura, the visceral pleura lies against the parietal pleura, separated by a potential space (pleural space) that contains just enough pleural fluid for lubrication (3). When the lungs inflate with air, the smooth, moist visceral pleura coheres to the smooth, moist parietal pleura allowing for easy and pain free respiration due to lack of friction (3).

External Injuries

External thoracic injuries include rib contusions, costochondral separations, sternoclavicular dislocations, sternal fractures, and rib fractures. These will be discussed in the order of severity beginning with the less severe. Table 1 outlines signs and symptoms of external rib injuries.

Rib Contusions

Rib contusions are the most frequent external thoracic injury in contact sports (4,8). A rib contusion is caused by a direct blow to the chest wall. Contusions to the ribs usually involve the bruising of the intercostal musculature. Often it is difficult to distinguish rib contusions from rib fractures, which will be discussed later.

Signs and symptoms of rib contusions are similar to
those of rib fractures. Due to contusions to the intercostals, the athlete will usually complain of sharp pain during inspirations and expirations. Tenderness is usually localized to a particular rib area with concomitant swelling if the injury is severe (1,2,4,5,6,7,8,9,10).

The athlete can be treated by ice application, compression, and rest. An athlete who is evaluated as having a rib contusion should be referred to a physician. X-rays should be taken to rule out possibility of a rib fracture (4,8,9).

**Costochondral Separations**

Costochondral separations are frequently common in contact sports. Costochondral separations involve the separation of the cartilaginous anterior portion of the ribs with either the sternum medially or the body rib laterally (10). Common mechanisms of costochondral separations include a direct blow, rib cage compression, and the arm being pulled to one side which stretches the costochondral junction (9). If the force is great enough, a possible dislocation of the articulation between the rib and its articulating cartilage may result.

If a costochondral injury is present, the athlete will complain of an initial sharp pain. The sharp pain is gradually replaced by stabilizing, intermittent pain over the site of the injury as the disrupted cartilage and bone override each other, producing a prominence of the anterior chest that suddenly disappears as the cartilage clicks back into place (10). There is localized pain and tenderness over the costochondral junction with an audible clicking. The athlete will probably complain about a pop when the injury occurred. A palpable defect may be present if the rib has displaced anteriorly. Mild swelling is usually present, and deformity may or may not be present depending on the severity of the injury. The athlete may experience difficulty in breathing deeply (1,2,4,5,6,7,8,9,10).

Management for costochondral injury must include x-rays to determine the possibility of rib fracture. Treatment is usually conservative with ice application, restrictive taping, and rest.

**Sternoclavicular Dislocation**

Sternoclavicular joint dislocations are not common in athletic activities. However, it is important to be able to recognize them when they do occur. Sternoclavicular dislocations occur when an athlete falls on the acromioclavicular joint, and the force of the fall is transmitted medially through the clavicle to the sternoclavicular joint. The proximal clavicle can displace either anteriorly, superiorly, or posteriorly (10).

A posteriorly displaced proximal clavicle is rare, but it is the most dangerous. A posterior dislocation can produce a life or death situation by impinging the great vessels, esophagus, or trachea (4,8). The anterior dislocation is the most common and is less dangerous because the proximal tip of the clavicle overrides the sternum. The anterior dislocation usually does not constitute a life or death situation.

Signs and symptoms of sternoclavicular are extremely noticeable. Gross displacement of the sternoclavicular joint is present, and swelling is usually considerable. The athlete will experience upper extremity disability. With a possible posterior dislocation, dyspnea may be present due to impingement of the trachea (1,2,4,5,6,7,8,9,10).

Athletes with sternoclavicular dislocations must have their arms supported against the chest with swaths. Under no circumstances should the athletic trainer attempt to reduce a sternoclavicular dislocation. The athlete's vital signs should be carefully monitored, and the athlete should be transported to a medical facility. Ice application is useful in decreasing pain and swelling.

**Sternal Fracture**

Sternal fractures occur infrequently in sports. Sternal fractures are caused by either a direct blow to the sternum, a violent compression force applied posteriorly which compresses the rib cage, or hyperflexion of the trunk which compresses the thoracic cage (4,8).

With sternal fractures the manubrium has an important role. If the superior portion of the manubrium passes behind the body at the point of the fracture, the possibility of airway obstruction exists (6). If the sternum is broken completely away from the ribs a condition known as "flail chest" will be present and the potential for a pneumothorax and/or hemothorax is greatly enhanced. The athlete will complain of severe chest pain upon inspiration. There is usually localized pain directly over the sternum. Frequently, the athlete will assume a position in which the head and shoulders are dropped forward (4,8). Mild swelling is usually present, and deformity may be seen if displaced fragments occur (1,2,4,5,6,7,8,9,10).

Sternal fractures can become life or death situations and must be managed properly. The athletic trainer must continually monitor the athlete's vital signs. Respiratory distress is very possible if the fracture is displaced posteriorly (6). The chest must be immobilized by applying either adhesive taping, light sand bags, or pillows over the fracture site. A sand bag or pillow may be held in place by securing with cravat bandages. The athlete must be referred to a medical facility immediately. X-rays are a must. Remember, a sternal fracture may cause a pneumothorax and/or a hemothorax.

**Rib Fracture**

Rib fractures are very common in contact sports with the greatest incidence occurring in football (4,8). Two types of rib fractures occur in athletics. The first type is the nondisplaced or greenstick fracture. The second type of rib fracture is the displaced fracture. This type is less common than the first, but it is more dangerous. Displaced fractures may cause a laceration of a lung, causing a pneumothorax and/or hemothorax. Rib fractures can occur indirectly as a result of rib cage compression or violent chest musculature contraction (4,8). The indirect fracture is characterized by the outward displacement of the rib, and it is not as dangerous as the direct rib fracture. Fractures usually occur at the point of impact or at the weak posterior angle of the rib (10). Ribs that are the most susceptible to fractures are the 5th through 9th pairs. Lower rib fractures may lacerate the liver, spleen, or kidney.

An athlete who has a rib fracture will have extreme localized chest pain and point tenderness directly over the fracture site. Sneezing, coughing, inspiration, and movement aggravate the pain. Rapid and shallow breathing is usually present because of the intense pain. The athlete may hold his chest to help prevent movement. Bony deformity and crepitation are usually present with displaced fractures. A rib fracture usually is characterized by failure of one side of the thorax to expand upon inspiration (1).

Management of rib fractures involved standard first-aid. The athletic trainer should monitor the athlete's vital signs continuously. The chest should be splinted by applying either adhesive taping, light sand bags, or pillows over the fracture site. A sand bag or pillow may be held in place by securing with cravat bandages. The athlete must be referred to a medical facility immediately. X-rays are a must. Remember, a sternal fracture may cause a pneumothorax and/or a hemothorax.

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using swaths or cravat bandages, and the athlete must be transferred to a medical facility for diagnosis and x-rays. Non-restrained breathing and bed rest is the suggested method for healing.

**Internal Injuries**

Internal thoracic injuries rarely occur during athletic participation; however, they must be discussed because of the seriousness of their consequences. These injuries usually involve the heart and/or lungs, and they usually result from external trauma. Examples of these are pneumothorax, hemothorax, cardiac contusion, and traumatic asphyxia. Table 2 outlines the signs and symptoms of internal injuries.

**Pneumothorax**

Pneumothorax is a condition in which the pleural cavity becomes filled with air that has entered through an opening in the chest (4,8). A pneumothorax usually results from blunt trauma associated with a rib fracture which causes a laceration of a lung to occur; however, a pneumothorax can also occur without an accompanying rib fracture. Sudden compression of the chest while the glottis is closed can result in a “blow-out injury” caused by the rupture of alveoli (10). A pneumothorax can be classified as either traumatic or spontaneous.

A traumatic pneumothorax can occur when the lung is punctured by a bone fragment resulting from a fractured rib. When lung tissue is lacerated, air from the lung enters the pleural cavity with each inspiration. As the air is trapped into the pleural cavity, the lung separates from the chest wall. With the air continuing to fill the pleural cavity, the volume of the lung is reduced, and the lung can no longer expand normally. As the uninjured lung fills with air, the trachea may shift or deviate toward the side of the collapsed lung. If the tear does not heal itself, the trapped air cannot escape from the pleural space and will continue to increase. The pressure will continue to build in the affected pleural cavity causing the collapsed lung to possibly press against the uninjured lung and the heart, thereby reducing their efficiency. This creates a life threatening situation called a “tension pneumothorax” (6). Immediate medical attention is required.

A spontaneous pneumothorax occurs in the absence of trauma, and can occur in a previously healthy athlete. The spontaneous pneumothorax usually affects individuals between 15 and 20 years of age, or immediately after activity when an area of lung tissue ruptures spontaneously. This results in release of air into the pleural cavity (6). Coughing and other such simple exertions can cause a spontaneous pneumothorax.
Signs and symptoms of pneumothorax include rapid progressive dyspnea, chest pain, shallow and rapid respiration with poor air entry into the affected lung, and hyper-resonance to percussion over the affected area (4,8,9). The athlete may complain of referred pain at the tip of the shoulder of the affected side. Cyanosis may be present if a large pneumothorax exists (1,2,4,5,6,8,9,10). The athletic trainer must focus past the non life threatening fractured rib and concentrate on the possibility of a pneumothorax.

Management includes monitoring vital signs continuously. The athletic trainer must be prepared to administer mouth-to-mouth resuscitation if needed. The athlete should be stabilized and transported to a medical facility immediately. If a penetrating chest wound is present, an occlusive dressing made of plastic wrap or aluminum foil must be secured over the wound to prevent any additional air from entering the pleural cavity (5).

Hemothorax

Hemothorax is a term for blood in the pleural cavity, and is usually resultant from a blunt chest injury. Pleural bleeding may arise from a lung that is either lacerated by the fragments of a fractured rib or from a “blowout injury” (10). Bleeding from the lungs tends to be self-limited because of the relatively low pulmonary vascular pressure; however, intrathoracic bleeding that occurs from laceration of an intercostal artery by a fractured rib may be rapid and exsanguinating due to the relatively high blood pressure within the artery (10). A hemothorax can occur in conjunction with a pneumothorax. This is a called a hemopneumothorax (10).

Signs and symptoms may be absent if only a small amount of bleeding occurred. Signs and symptoms of a large hemothorax include low blood pressure, decreased cardiac output, impaired respiration, cyanosis, restlessness, and shock due to loss of blood (1,2,4,5,6,8,9,10). The major sign of a hemothorax is the coughing up of red, frothy blood or spitting of blood stained sputum (6).

Management includes the continuous monitoring of vital signs. The athletic trainer must be alert and be prepared to administer artificial ventilation. Treat the athlete for shock and transfer the athlete to a medical facility immediately.

Cardiac Contusion

Cardiac contusion may occur when the heart is compressed between the sternum and the spine by a strong external force, such as being struck by a pitched ball or bouncing a barbell off the chest during a bench press (4,8). A cardiac contusion can result in a pericardial effusion, which may lead to cardiac tamponade (9).

Signs and symptoms of cardiac contusions are muffled heart sounds, engorgement of the neck veins, low blood pressure, heart pain, severe shock, and a pulse which seems to disappear upon inspiration (1,2,4,6,8,9,10). Cardiac tamponade is a life threatening condition which must be treated immediately.

Management involves continous monitoring of vital signs. The athletic trainer may find it necessary to administer artificial ventilation. The athlete should be stabilized, treated for shock, and transported to a medical facility immediately. Death may ensue if medical attention is not administered immediately.

Traumatic Asphyxia

Traumatic asphyxia is a term given to a group of signs and symptoms that result from a very severe sudden compression of the chest (1). The blow or compression force of high magnitude causes complete cessation of breathing. Such injuries cause a caved-in chest wall with fractures of the ribs and sternum (1). The sudden pressure on the heart forces blood back from the right side of the heart into the veins of the neck, head, and shoulders. Also, the sudden compression may cause rupture of air sacs within the lung and cause severe pulmonary damage (1).

Signs and symptoms of traumatic asphyxia include severe shock, cyanosis of the head, neck, and shoulders, and bloodshot and protruding eyes (1,4,8). The athlete may also possess possible chest deformities, vomitus with blood, and a swollen and cyanotic tongue and lips (1,4,8). The main and most important sign of traumatic asphyxia is the complete cessation of breathing (1). The athletic trainer must make a careful observation to notice these important signs and symptoms of traumatic asphyxia.

Management of a traumatic asphyxia victim includes immediate mouth-to-mouth resuscitation and transportation to an emergency medical facility. Also, the athletic trainer must treat to prevent further shock. If prompt action is not taken, death will occur in minutes.

Summary

In athletics, thoracic injuries occur mainly in contact sports. Thoracic injuries are classified as either external or internal injuries. External injuries result from direct trauma and include rib contusion, costochondral separations, sternoclavicular dislocation, sternal fractures, and rib fractures. Most external thoracic injuries are not life threatening. However, the possibility always exists that they could become life threatening.

Internal injuries are usually a result of external trauma and include pneumothorax, hemothorax, cardiac contusion, and traumatic asphyxia. Most internal thoracic injuries involve the heart and/or lungs, and they require immediate medical attention. The athletic trainer must be aware of the mechanisms, characteristics, and management of various thoracic injuries in order to provide a correct and proper thoracic evaluation.

References

Sports Psychology

Sports psychology is becoming a bona fide field of study, but psychologists are arguing whether it’s an applied science or if it should be left strictly to research. The definition of sports psychology is also a debatable issue. Some psychologists claim that it is a subdiscipline of psychology, while physical educators claim it’s a sport science (1). Sports Psychology may be broadly defined as a science that deals with the mental and emotional aspects of physical performance (1). Applied Sports Psychology is very much like applied biomechanics, applied physics, or applied physiology, in that it involves taking theories and techniques into the field and using them in an attempt to better understand, predict, and control behavior. What is new or relatively new in the development of theoretical frameworks provides some structure and direction to the field. There are now logical reasons and not just superstitions used.

There’s a lot of confusion now about who can really call themselves “sports psychologists.” Not all sport psychologists are actual psychologists. Psychologist is a term that is well regulated by state statutes and requires a specific level of education and experience before anyone can legally use the term or practice it. Some of the so called “sport” psychologists are not psychologists at all. They are physical educators, coaches, or athletic trainers with minimal or no background in psychology.

Sports psychology specialists usually attempt to help athletes learn to relax, concentrate, and use imagery for emotional and mental control in order to enhance performance (2). They help athletes work out personal problems, try to improve their attitudes, reduce anxiety, and improve motivation levels (2). This does work sometimes, but in some instances it depends on the mood and willingness of the athlete. Sports psychology also should never be depended upon as a sure thing, although many coaches do.

Two problems our athletes may experience are: 1) overcoming the “I can’t” syndrome, and 2) learning to deal with personal losses. Both these problems may very well need a sports psychologist to be overcome. Trainers, coaches, or parents won’t have the expertise to help the athlete deal with these problems. If that time comes, then the trainers, coaches, or parents need to realize that they need assistance and acquire the services of a sports psychologist, instead of thinking they, themselves, can become instant psychologists.

In dealing with the two problems discussed previously, it was found in the research how sports psychologists help athletes learn to deal with personal losses. The article described some losses frequently experienced by athletes, discussed the common reactions in dealing with losses, and suggested how to approach the athlete dealing with a loss. S. J. Astle described four losses an athlete may suffer: 1) loss of significant people, 2) loss of self-image, 3) loss of external objects, and 4) loss of abilities. Astle also described the five stages in which the athlete responds to losses: 1) denial and isolation, 2) anger, 3) bargaining, 4) depression, and 5) acceptance (6). The therapeutic strategy was based upon Worden’s (1980) model which teaches that an athlete must maintain an active rather than a passive role in learning to accept the loss. The four tasks in strategy were outlined: 1) accept the reality of the loss, 2) experience the pain of grief, 3) adjust to the new environment that is void of the loss, and 4) withdraw emotional energy and refocus it into another direction or activity (3). With the help of a professional, this strategy can aid an athlete’s recovery from any loss that he or she may suffer.

In overcoming the “I can’t” syndrome the article explained that the single most devastating opponent an athlete can have is negative thoughts and what can be done to teach an athlete to recognize and control internal thoughts when it becomes negative and detrimental to effective performance. S.G. Ziegler offered some general guidelines and a negative thought stopping (NTS) program. The NTS program consists of four phases: 1) education, 2) awareness, 3) change, and 4) evaluation (4). The initial education phase is directed toward developing an understanding of the effects that negative thoughts and stress have on mental and physical performance. Then, in order to become more aware of their negative thoughts, it was suggested that the athletes keep a diary counting the number of negative thoughts and the types of situations in which they occur each day. The change process consists of two parts: (A) stopping the negative thoughts, and (B) then incorporating positive reprogramming (4). Finally, an ongoing system of evaluation is suggested to ensure maximum effectiveness. It was concluded that through practice and feedback the athletes can be helped to develop positive and constructive thoughts, images, concentration cues, and calming responses in order to enhance desired behaviors.

As R.K. Dielman stated, “In some fields, it’s easy to tell if what you’re doing is working. In sports psychology it’s not always clear.”(4) It may not be clear, but in some cases it’s better to let the sports psychologist handle an athlete’s problems instead of an athletic trainer or coach trying to resolve the problem that is beyond our realm of expertise.

References


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Roles and Relationships Between Sports PT's and ATC's

Kenneth L. Knight, Editor

In June 1987 the Executive Committee of the Sports Physical Therapy Section of the American Physical Therapy Association approved the following statement concerning the roles and relationships of the Sports Physical Therapist and the Certified Athletic Trainer. It was then published in the December 1987 issue of the Journal of Orthopedic and Sports Physical Therapy (9:207-208).

Some athletic trainers are upset with this document because they feel it is a put down of the athletic training profession. Others feel it applies only to those athletic trainers and physical therapists who work in sports medicine clinics and that it was long overdue. The issue will no doubt be debated by many. So that our membership can be fully informed, we have received permission from JOSPT to reprint the document.

ROLES AND RELATIONSHIPS OF THE SPORTS PHYSICAL THERAPIST AND THE CERTIFIED ATHLETIC TRAINER

How These Two Groups Practice Within the Sports Medicine Team Concept

With recent trends toward increased concerns regarding fitness as well as tremendous athletic participation in organized and recreational sporting activities at all ages, it logically follows that there are more sports related injuries as well. In an effort to meet the demands of today's athletic community, the Sports Physical Therapy Section of the American Physical Therapy Association has grown to greater than 5,000 members. The Sports Physical Therapist (Sports P.T.) is indeed a vital member of the health care team that delivers care to these athletes in all walks of life. The exact role of the Sports P.T. requires specific delineation because there is an apparent overlap in areas of responsibility with other professional groups.

The Sports Physical Therapy Section believes the following reflects practice as it occurs today:

I.

The Sports Section of the American Physical Therapy Association notes the following as major roles of the Sports Physical Therapist (Sports P.T.):

A. Sports Injury Prevention
B. Sports Injury Assessment
C. Management of Sports Injuries, both acute and rehabilitative
D. Sports Injury Research
E. Sports Injury Education

The National Athletic Trainer's Association's (NATA) certified members (A.T.C.) have college undergraduate degrees as a minimum and fulfill stringent requirements for taking and passing the Professional Examination Services (PES) prepared examination developed by the NATA Board of Certification. The six major domains of the certified athletic trainer are:

1. Prevention of athletic injuries
2. Recognition and evaluation of athletic injuries
3. Management, treatment, and disposition of athletic injuries
4. Rehabilitation of athletic injuries
5. Organization and administration of athletic training programs
6. Education and counseling of the athlete

As you see, the working roles of the two organizations overlap in their basic philosophies. The NATA's philosophies are directed at athletic health care in the school/college/university setting, the amateur organizational setting, and the professional organizational setting. This traditional team concept places the team physician as supervisor with the A.T.C. treating athletes from only that team or organization. There is no fee for service, no third party payers, and it is not called physical therapy.

The Sports Physical Therapist may treat on referral or direct access (as directed by his or her physical therapy practice act), athletes from all walks of life and with all types of medical background in hospital, clinic, and training room environments. In the traditional team concept setting, the Sports P.T. would interact with the athlete at the trainer's or physician's request. There are, however, a variety of other possible situations where the Sports P.T. may contract with or work for the school or organization and deliver the appropriate athletic health care.

II.

Within the physical therapy profession, it is now possible through specialization for a physical therapist to be recognized as being competent in the area of overall care for an athlete. This specialization does not make the therapist a certified athletic trainer. It does insure the athletic public that the therapist has a credential in athletic injury care to go with the therapist's medical background.

The physical therapist with an A.T.C. credential would qualify for a traditional athletic training position as well as the ability to provide physical therapy in a clinical setting. This therapist would also have a credential insuring the athletic public that he or she has a sports injury background.

III.

Legislation presently existing in some states has delineated the role of the A.T.C. and in those states dictates how the A.T.C. may practice. This legislation therefore describes where and in what manner the A.T.C. may treat athletic injuries and supersedes any position that the Sports Physical Therapy Section may take.

In states without athletic training legislation, the A.T.C. functions in a team or school concept under the direction of the team doctor. The A.T.C. employed by a physician would come under the regulation of the medical practice act of that state or possibly have no legal status at all. The physician has responsibility for the A.T.C.'s actions in most states. Neither the trainer nor the physician, could call their care physical therapy or charge for physical therapy services, unless a physical therapist is involved in the athlete's care.
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*The study adapted a human model of acute inflammation previously used in the study of systemic disease. An approximation of local tissue responses were made by injecting chemicals which the body itself produces following injury. Bradykinin and Prostaglandins have been shown to generate a summating effect when injected subcutaneously and this method was chosen to objectively assess cryotherapy. Study available upon request.
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IV.
Clinical settings providing physical therapy services which employ an A.T.C. must provide that the A.T.C. functions under the direct supervision of the physical therapist. The supervising physical therapist in this situation must adhere to the following House of Delegate policies pertaining to supervisory relationships:

HOD06-85-20-41
HOD06-72-10-13
BOD03-06-21-83
HOD06-86-06-09

The A.T.C. employed by a physical therapy clinic can play a supporting role with the Sports P.T. in injury prevention by being involved in pre-season assessment and conditioning of athletes. The A.T.C. similarly is a necessary component of the athletic health care team by being present at the site of the competition during practices and games to provide immediate care to injured athletes.

Following the evaluation and development of a rehabilitation program by a physical therapist, the role of the A.T.C. in the physical therapy clinic may include assisting the physical therapist in instruction and monitoring of exercise prescriptions and setting up the various physical therapy treatment modes. The A.T.C. also plays a vital role in assisting the Sports P.T. in preparing an athlete to return to competition by developing and conducting a specific reconditioning program for return to a particular sport or activity.

V.
Sports medicine is a multi-disciplinary approach to the care of the athlete in which both physical therapists and athletic trainers are vital members.

VI.
Most importantly, the care of the athlete should be given at the highest possible degree with interest of the athlete foremost.

PBATS Rising To The Top Of Its Game

David Mooney

Through no fault of their own, athletic trainers at all levels of professional baseball have been the Rodney Dangerfields of their field—they got no respect.

While they toiled at spring training in Arizona and Florida, athletic trainers employed by high schools, colleges, clinics and other professional sports teams attended regional meetings to keep abreast of ever-changing developments in the health care industry.

While they labored through extra innings and hot, dusty bus rides during the summer, thousands of athletic trainers gathered in air conditioned comfort at the annual NATA meeting in June to learn from the finest minds in sports medicine.

Professional baseball’s athletic trainers understood that the National Athletic Trainers’ Association scheduled meetings to accommodate the majority of its members. They agreed that June is, in fact, the best time for the vast majority of members to attend the annual NATA symposium. So to ensure that athletic trainers in baseball kept pace, PBATS took matters into its own hands.

Under the guidance of Charlie Moss and Jeff Cooper, head athletic trainers for the Boston Red Sox and Philadelphia Phillies respectively, The Professional Baseball Athletic Trainers Society (PBATS) was formed in 1983 to meet a crucial need for continuing education. What PBATS has achieved in less than five years is just short of remarkable. Upon review this spring of what PBATS has accomplished, NATA Executive Director Otho Davis and President Jerry Rhea agreed that PBATS has become an indispensable component of the athletic training profession.

Strength in Numbers

PBATS is comprised of some 150 athletic trainers currently employed at the major league and minor league levels of baseball. With corporate support from The Quaker Oats Company, maker of Gatorade Thirst Quencher, they have galvanized their resources to make a vital contribution not only to their profession, but to the game of baseball.

While their primary responsibility is to enhance and protect the health and well-being of their athletes, Major League trainers have developed an integrated education program that contributes more to the game than injury management and rehabilitation. It will reduce injuries, diminish the risk of misdiagnosis and, ultimately, help
At the core of the PBATS continuing education program is a seminar held in March each year in Florida and Arizona. Team physicians from major league clubs serve as faculty, as do experts in acute care, rehabilitation, the legal profession and elsewhere. Topics range from AIDS and allergies to head injuries, pharmacology and the hazards of chewing smokeless tobacco.


"We rarely have the luxury of hearing an expert tell us the facts and myths about head injuries, AIDS or smokeless tobacco," he said. "I tip my hat to Ned Bergert (assistant trainer for the California Angels) and the other major league trainers who put this together. They are clearly making the effort to share their knowledge with us, and to bring in health care professionals for our benefit. I'm eating up every minute of this."

The most popular topic at the Arizona seminar in March was drug abuse. Speaker Mark Letendre, head trainer of the San Francisco Giants, shared his experience with a former player who suffered from cocaine abuse. Letendre explained that by being aware of common symptoms of substance abuse, he was able to open lines of communication with the athlete. Treatment was sought and the problem was resolved.

"The drug abuse topic gave me a good idea of what to expect and what to do if it happens with one of my athletes," said Joe Chavez, athletic trainer for the San Diego Padres' Double A team in Wichita, Kansas. "I'll know the proper steps to take and common mistakes I should try to avoid. This seminar helped us realize the crucial role played by the athletic trainer as a communicator."

Balanced Diet of Education

While the seminar series is the cornerstone of the education program, PBATS has also developed a video tape reference library for its members; a delivery system to ensure that every member of the organization receives current news and information pertaining to athletic training; and a booklet on proper nutrition and eating habits.

Marjorie Hagerman, nutritional consultant to the Cincinnati Reds, helped PBATS write the booklet, entitled "Home Plate Strategy." She said it is primarily aimed at minor league players.

"I commend PBATS for getting nutritional information into the hands of their minor league players," said Hagerman, a registered dietitian participating in the seminar. "The goal is to increase awareness of the importance of good eating habits and show how good nutrition can improve athletic performance."

Since 1984, PBATS has sponsored a scholarship fund to benefit student trainers. Moss calls the annual $1,500 contribution to the NATA scholarship program another way to do something good for athletic training and for baseball.

For the second year, PBATS produced its own media guide with biographical information on each major league trainer. The PBATS media guide also included a glossary of medical terms to help the media better understand injury management and rehabilitation.

And for the third time, a PBATS representative will address the general membership at the annual NATA meeting and clinical symposium. The Phillies' Cooper will make his presentation on "Rehabilitation of the Elbow" on Sunday, June 12.

While serving their athletes and their profession well, Milwaukee Brewers assistant trainer Al Price says PBATS is making some new inroads with its continuing education program.

"The formation of PBATS has given us an excellent opportunity to be recognized by important people within the game," Price said. "Owners, general managers, field managers and other front office personnel understand more clearly now that we're working together to improve professional baseball. I think it important they realize that PBATS is committed to providing the best possible health care to our athletes. This is, after all, what they hired us to do."

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Athletic Trainer of the Year

The recipients of the 1987 Athletic Trainer of the Year awards, as sponsored by NUTRAMENT, were noted in the Spring issue of the Journal. The winners of this prestigious award, now in its 12th year, are selected by the 6,000 certified athletic trainers of the NATA. NUTRAMENT donates a cash prize in the name of each winner to a scholarship or other worthy cause of their choice. This year there are five winners, due to a tie in the Professional division. It is a privilege to briefly summarize the impressive backgrounds of the recipients of this prestigious award. The following biographical information is provided through the courtesy of Sara Paxton of the Drackett Company.

Ronnie Barnes, New York Giants
Professional Division

A 1975 graduate of East Carolina University, Barnes has also done graduate work at East Carolina and holds a Masters degree in health administration from Michigan State University.

Barnes has been associated with the New York Giants since 1975, and was named Head Trainer in 1980. During this association he has actively sought innovations to maintain player health and prevent injury, and in 1984 instituted an employee assistance program to help drug abuse.

Barnes, who has been very active within the NATA, was first voted Athletic Trainer of the Year in 1984. In 1987 he was appointed to serve on the New Jersey Advisory Committee to the Governor's Council for Physical Fitness. He is a past president of the Michigan State Trainers Association, and has served on the Governor's Advisory Commission for Sports Medicine in North Carolina.

A teacher as well as a practitioner, Barnes has taught at East Carolina University and Michigan State University. Additionally, he lectures across the country at seminars, conferences and various universities.

Otho Davis, Philadelphia Eagles
Professional Division

Davis has served the NATA as the Executive Director since 1971. During his 17-year tenure the Association has doubled its membership and achieved a solid financial position, holding assets worth more than one million dollars. Davis credits the growth and stability of the organization to the dedicated hard work of the membership.

Under Davis' leadership the NATA has established the National High School Injury Registry, a program chartered to determine the number and severity of time loss injuries in high school athletics. These data will help the NATA build its case for placing a certified athletic trainer in every high school with an athletic program.

Davis began his career at Lamar University and Kent State University where he received his B.S. and M.A. degrees. He then served as athletic trainer at Duke University and the N.F.L.'s Baltimore Colts before joining the Eagles in 1973.

Five-time winner of the Athletic Trainer of the Year Award, Davis is published in professional journals, is the recipient of research grants, and is the owner of two patents for athletic equipment. He has made presentations to the American Society of Orthopedic Surgeons, and has served the NATA in a number of executive offices. Honored in 1981 with his election to the NATA Hall of Fame, Davis was inducted into the Southwest Athletic Association Hall of Fame in 1987. In 1983, Davis was presented with the American Orthopedic Society for Sports Medicine Distinguished Service Trainer Award.
Gary Lang, Sacramento City College  
Junior College Division

In addition to his position as Head Athletic Trainer and instructor at Sacramento City College, Lang is Director of Athletic Training Services for Crowd Physical Therapy in Sacramento where he supervises nine high school athletic trainers and three junior college trainers. Lang created the program for providing athletic training service through Crowd Physical Therapy to Sacramento high schools.

Lang holds an Associate Degree from Sacramento City College and a B.S. degree in Physical Education with an emphasis in athletic training from California State University at Sacramento. For his Master's degree he studied athletic training at the University of Arizona.

Active in the profession, Lang is the Legislative Chairman for the California Athletic Trainers Association and the Licensure Chairman for District 8. He is a founding board member of the California Athletic Trainers Association, and served two years as Chairman of the California Coalition of Allied Health Practitioners. Lang has lectured at state and district conventions of the NATA, and frequently speaks to coaches of youth sports on injury prevention.

Michael E. O'Shea, University of Louisville  
College Division

A 1968 graduate of the University of Texas with a Bachelor's degree in physical and health education, O'Shea also holds a Master's degree from Kent State University. In 1971, he received the prestigious honor of Non-Commissioned Officer of the Year at the U.S. Air Force Academy. He served twice as athletic trainer for the AAU Men's and Women's Indoor Track and Field Team international competition, traveling to the Soviet Union in 1975 and to Italy in 1977.

After serving as the Baltimore Colts trainer for six years, O'Shea was invited by former Colts coach Howard Schnellenberger to join him at the University of Miami. Six years later O'Shea followed Schnellenberger to the University of Louisville in 1985.

O'Shea made a major contribution to the profession when he researched and authored the History of the National Athletic Trainers Association which was published in 1980. Additionally he has served as Chairman of the NATA History and Archives Committee since 1974, and served two years on the NATA Journal Committee.

O'Shea was named an Outstanding Young Man of North America in 1979, is a member of the Orthopedic Society of America, and is a licensed Athletic Trainer in the state of Texas and Kentucky.

Kirby E. Patterson, West Charlotte High School  
High School Division

A 1977 graduate of East Carolina University with a Bachelor's degree in health and physical education, he
Recently, 65 athletes at the University of New Hampshire rated four major brands of leg extension/leg curl machines. Strength coach George Elder wanted to see which machine performed best. The results surprised everybody but us. After five weeks of intensive workouts, 82% of the athletes preferred the IsoPower LE400 to the other three brands. For a field report on the performance comparison and information on the remarkable IsoPower lineup, please call 1-800-247-7232. (In MN, call 1-612-887-5995.)
also earned a Master of Arts in Education from East Carolina. A certified athletic trainer since 1977, Patterson began his professional teaching and athletic training career at East Carolina University. In 1979 he moved to Richmond Senior High School (Rockingham, NC), and came to West Charlotte High School in 1982 where he teaches physical education and athletic training. Additionally, Patterson has served as athletic trainer for a number of special events, and was head trainer for the Kinston Eagles (Kinston, NC), a minor league baseball team affiliated with the Toronto Blue Jays.

Active within the profession, Patterson has served in the capacity of President and member of the Board of Directors of the North Carolina Athletic Trainers Association. Last summer he was voted Athletic Trainer of the Year by the North Carolina trainers. Nationally, he's a member of the Student Trainer Committee.

**District News**

**District 3**

David Perrin, Curriculum Director of Graduate Athletic Training at the University of Virginia, conducted a 10-day Cramer workshop in Taipei, Taiwan in February for 50 students of the recently established Republic of China Athletic Trainers Association. Teaching through an interpreter, Perrin worked with Jim Dickerson of Cramer Products, Inc. in helping students from five universities. While in Taipei, Perrin and Dickerson also met with the R.O.C. Sports Medicine Association to discuss structuring of educational programs for the ROC Athletic Trainers Association.

District 4

Mike Duchaj of Maine South High School, IL, has been invited to participate in a round table discussion on sports medicine with the American Academy of Orthopedic Surgeons.

Don Nielson, St. Charles High School, IL, received the Outstanding Teacher Award from the Illinois State Board of Education last fall.

Alan Howard, Wheaton College, will travel to the Peoples Republic of China as a member of an American delegation. The trip is for an educational exchange between American and Chinese professionals in the area of fitness and sports medicine.

**District 9**

Karen Swanson, head woman's athletic trainer at Florida State University, and student trainer Eileen Gatin have been credited with saving the life of a Florida State Athletic Department employee. Swanson performed mouth-to-mouth resuscitation and CPR while EMT's rushed to the scene. Because of their knowledge of CPR and quick actions, the employee is alive today.

---

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U.S. Patent No. 4249524 Other U.S. and Foreign Patents Pending
Calendar of Events

Jeff Fair, ATC, EdD, CCT

June
3-5 Shoulder Rehabilitation In Sports, Wyomissing, PA. Contact Bob Engle, PT, ATC or Bob Donatelli, PT, Center for Sports Physical Therapy, 1150 Berkshire Blvd., Wyomissing, PA 19610.

6-9 Universal Fitness Institute, Cedar Rapids, IA. Contact Universal Gym Equipment Company, P.O. Box 1270, Cedar Rapids, IA 52406 or telephone 800/553-7901.

10-12 Biomechanical Assessment and Treatment of the Foot and Ankle, Baltimore, MD. Contact the Sports Medicine Institute, P.O. Box 566095, Atlanta, GA 30356-6002.

11-15 National Athletic Trainers Association National Convention, Baltimore, MD. Contact the NATA National Office, 1001 East Fourth Street, Greenville, NC 27858.

12-15 Cramer Workshop, University of Colorado, Boulder, CO.

13-15 Sports Medicine/Athletic Training Seminar, Boston, MA. Contact Dr. Alfred Roncarati, RPT, ATC, U Mass/Boston, Division of Continuing Education, Harbor Campus, Boston, MA 02125-3395.

13-17 Cramer Coaches Clinic, University of Oregon, Eugene, OR 97403.

16 Corporate Fitness and Wellness: Current Status and Future Trends, Boston, MA. Contact Dr. Alfred Roncarati, RPT, ATC, U Mass/Boston, Division of Continuing Education, Harbor Campus, Boston, MA 02125-3395.

16 Strength Training for Athletics, Boston, MA. Contact Dr. Alfred Roncarati, RPT, ATC, U Mass/Boston, Division of Continuing Education, Harbor Campus, Boston, MA 02125-3393.

17 Electrotherapy in Orthopedics and Sports Medicine, Boston, MA. Contact Dr. Alfred Roncarati, RPT, ATC, U Mass/Boston, Division of Continuing Education, Harbor Campus, Boston, MA 02125-3393.


19-22 Cramer Workshop, Emporia State University, Emporia, KS.

19-22 Cramer Workshop, Florida State University, Tallahassee, FL.

19-22 Cramer Workshop, Northeast Louisiana University, Monroe, LA.

19-23 Cramer Coaches Clinic, University of Florida, Gainesville, FL 32611.

19-23 Cramer Coaches Clinic, Washburn University, Topeka, KS 66621.

20-24 Sports Physical Therapy Skills, New York, NY. Contact The Sports Medicine Institute, P.O. Box 566095, Atlanta, GA 30356-6002.

22-25 Cramer Workshop, Southwest Missouri State University, Springfield, MO.

24-26 Strength and Conditioning Coaches, Orlando, FL. Contact Debra Potter, Director of Marketing/Convention Coordinator, NSCA, P.O. Box 81410, Lincoln, NE 68501.

24-25 How to Implement and Manage a Sports Medicine Program, New York City, NY. Contact Ronald G. Peyton, The Sports Medicine Education Institute, Box 566095, Atlanta, GA 30356-6002.

22-26 Sixth Annual Conference on Innovations in Sports Medicine, Galveston, TX. Contact Gayle Norris, Office of Continuing Education, J-34, University of Texas Medical Branch, Galveston, TX 77550.

26-29 Cramer Workshop, Arizona State University, Tempe, AZ.

26-29 Cramer Workshop, Austin Peay State University, Clarksville, TN.

26-29 Cramer Workshop, Bucknell University, Lewisburg, PA.

26-29 Basic Cramer Workshop, Indiana University, Bloomington, IN.

26-29 Advanced Cramer Workshop, Indiana University, Bloomington, IN.

26-29 Basic Cramer Workshop, Kent State University, Kent, OH.

26-29 Advanced Cramer Workshop, Kent State University, Kent, OH.

26-29 Advanced Cramer Workshop, Northern Colorado University, Greeley, CO.

26-29 Cramer Workshop, Northern Illinois University, DeKalb, IL.

26-29 Cramer Workshop, North Texas State University, Denton, TX.

26-29 Cramer Workshop, University of Wisconsin/Whitewater, Whitewater, WI.

26-30 Cramer Coaches Clinic, Butler University, Indianapolis, IN 46208.

26-30 Cramer Coaches Clinic, Marshall University, Huntington, WV 25701.

26-30 Cramer Coaches Clinic, Montclair State University, Upper Montclair, NJ. 07043

27-29 “Sports Medicine”, Cleveland, OH. Contact Department of Continuing Education, The Cleveland Clinic Educational Foundation, 9500 Euclid Avenue,
July
10-13  Cramer Workshop, Salisbury State, Salisbury, MD.
10-13  Advanced Cramer Workshop, Texas/Arlington, Arlington, TX.
10-14  Cramer Coaches Clinic, University of Tennessee/Martin, Martin, TN.
16-21  41st Annual Scientific and Clinical Conference, American Kinesiotherapy Association, Nashville, TN.
17-20  Cramer Clinic, Livingston University, Livingston, AL.
17-22  Athletic Health Care System/National Leadership Institute, Seattle, WA. Contact Conference Management, University of Washington GH-22, Seattle, WA 98195.
20-24  Sports Physical Therapy Skills Course - Basic, Minneapolis, MN. Contact Ronald G. Peyton, Sports Medicine Institute, P.O. Box 566095, Atlanta, GA 30356-6002.
24-27  Cramer Workshop, North Dakota State University, Fargo, ND.
24-27  Cramer Workshop, College of William and Mary, Williamsburg, VA.
31-Aug 3  Cramer Workshop, Grand Valley State College, Allendale, MI.
31-Aug 3  Advanced Cramer Workshop, Western Illinois, Macomb, IL.

August
7-10  Cramer Workshop, Seattle Pacific University, Seattle, WA.
12-14  Biomechanical Assessment and Treatment of the Foot and Ankle - Fundamental Concepts, Seattle, WA. Contact Ronald G. Peyton, Sports Medicine Institute, P.O. Box 566095, GA 30356-6002.
14-17  Cramer Workshop, Northeastern University, Boston, MA.
19-20  How to Implement and Manage a Sports Medicine Program, Chicago, IL. Contact Ronald G. Peyton, Sports Medicine Institute, P.O. Box 566095, Atlanta, GA 30356-6002.

September
9-11  Knee Ligament Rehabilitation, Valley Forge, PA. Contact Center for Sports Physical Therapy, 1150 Berkshire Blvd., Wyomissing, PA 19610.
12-15  Universal Fitness Institute, Cedar Rapids, IA.
16-18  Biomechanical Assessment and Treatment of the Foot and Ankle - Fundamental Concepts, Atlanta, GA. Contact Ronald G. Peyton, Sports Medicine Institute, P.O. Box 566095, Atlanta, GA 30356-6002.
22-23  How to Implement and Manage a Sports Medicine Program, Philadelphia, PA. Contact Ronald G. Peyton, Sports Medicine Institute, P.O. Box 566095, Atlanta, GA 30356-6002.

ATHLETIC TRAINING will list events of interest to persons involved in sports medicine, providing items are received well in advance of publication. Please include the name and address of the person to contact for further information. Send items for the CALENDAR to Jeff Fair, Head Athletic Trainer, Athletic Department, Oklahoma State University, Stillwater, OK 74074. Refer to the following dates to ensure your event will appear in the desired issue.

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MOVING?
Please notify the National Office of your new address as well as your old address (at least 30 days in advance of publication).

Comp. of Training Table, from page 144

Acknowledgements
We gratefully acknowledge the co-operation and assistance of the Memphis State University Mens' Athletic Training Staff and of the staff of the athletic cafeteria.
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Dennis Aten, ATC, RPT, MS

Parents Tips
Protecting Your Child
U.S. News and World Report

In the October 5, 1987 issue of U.S. News and World Report magazine, writer Steven Findlay published recommendations for parents with youngsters who participate in sports. The recommendations are reprinted with permission of U.S. News and World Report.

If you're a parent, here are guidelines to help lower your child's risk of sports injuries:

- A child younger than age 6 shouldn't play competitive sports. Between 6 and 8, a child should be restricted to noncontact sports—swimming, tennis and track and field, for instance. At 8, competitive soccer is O.K. Ice hockey, tackle football and other "collision" sports shouldn't be allowed until 10.

- Does the team program have a certified athletic trainer, exercise physiologist or specialist in athletic conditioning? If not, you may want to more carefully consider your child's participation.

- Check the exercise equipment supplied by the school or program—barbells, conditioning machines, stationary bikes, jump ropes and the like. Is it of good quality and relatively new? Are the kids instructed on its proper use?

- Ask your child about practice. If the kids do less than 20 minutes of warm-up and conditioning, talk to the coach.

- Check the protective gear supplied by the school for fit. Ill-fitting helmets and other equipment can promote injuries. If you have to buy equipment, ask the coach, athletic trainer or other sports specialist for recommendations about what's best.

- See if the school or program has access to a hospital or clinic where kids can be brought and treated if they're injured seriously. If your child is injured, ask how the injury was treated. And don't let your child play hurt.

- Encourage your child to be active in other areas, such as hiking or swimming, that build stamina and strength. It can help to ward off injuries.

- Take your child for a full physical examination before allowing him or her to play any organized sport.

- Don't let an overtired child practice or play in a game. Fatigue raises the risk of injuries.

NEISS Data Highlights

In 1986 the Consumer Product Safety Commission (CPSC) marked the fifteenth anniversary of its primary data system: the National Electronic Injury Surveillance System (NEISS). The Commissioners and others continue to rely on information collected through the NEISS sample of hospital emergency rooms to alert them to potentially unsafe consumer products. Commission analysts and others interested in the types of product-related injuries treated in hospital emergency rooms routinely use NEISS data.

In 1972 the Commission began using hospital emergency room (ER) data as the most comprehensive and practical method for measuring product-related injuries. Because the hospitals selected are a probability sample of all hospital emergency rooms in the U.S., NEISS data can be used to make national estimates of injuries treated in hospital emergency rooms and determine the statistical confidence levels for the estimates. Although many other avenues for collecting product-related injury data have been tried, none has served the purpose so well as the NEISS. Currently, CPSC uses data from other sources to supplement the NEISS, but the NEISS remains the cornerstone for injury data.

Through the National Injury Clearinghouse, the Commission shares NEISS data with industry, lawyers, researchers, sports medicine and others with an interest in product-related injury data. For instance, they studied 6,828 emergency room cases of basketball related injuries and 5,415 emergency room cases related to football which lead to an estimated 457,746 and 382,173 total cases in 1986 respectively.

Nutrition Labeling and Health Claims

Dairy Council Digest

Since the introduction of nutrition labeling in the mid-1970s, implicit health claims (e.g., a good source of vitamin C) have become an important part of food labels. During the past decade, the Food and Drug Administration (FDA), which regulates labeling for most foods, has supported implicit health claims. This government agency has published regulations to define terms such as "low calorie" and "reduced calorie," established new sodium regulations, and proposed that additional information (e.g., cholesterol) be included on nutrition labels.

More recently, there has been increased demand for explicit health-related or disease prevention claims on food labels. Historically, the FDA has prohibited such
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From the makers of Gatorade® Thirst Quencher, a new good-tasting high-carbohydrate beverage that can help you increase your endurance.

Who knows athletes' needs better than the makers of Gatorade® Thirst Quencher? And now the leader in performance beverages for over 20 years introduces GatorLode™ Drink Mix. GatorLode™ Drink Mix is a great tasting, concentrated source of carbohydrates to supplement your diet: for pre-workout carbo-loading, and post-workout recovery. It supplies energy to help you achieve a higher level of endurance. And unlike other carbohydtes drinks, GatorLode™ drink mix comes in 3 great tasting flavors: Lemon, Banana and Citrus.

Carbohydrates and endurance.

A high-carbohydrate diet is essential for athletes involved in intense competition and training. Carbohydrates are stored in muscles and the liver as glycogen, which is broken down during exercise to provide energy for working muscles. A high glycogen content is essential for optimal performance and a diet high in carbohydrates enhances glycogen storage. By storing extra glycogen before a workout or competition, you can actually increase endurance.

GatorLode™ Drink Mix comes from the makers of Gatorade® Thirst Quencher, the leader in performance beverages. They have the experience needed to give you the optimal performance from a high-carbohydrate beverage. This Drink Mix is an excellent source of carbohydrates that can be readily converted into glycogen to aid your performance.

When to drink GatorLode™ Drink Mix. Because GatorLode™ Drink Mix is a quick, easy way to add carbohydrates to your diet, it can be used in a number of ways for additional energy. Taken in between or with meals during training, it helps supplement your carbohydrate intake. Taken soon after competition, it helps to restore lost glycogen and speed your recovery. It contains B-complex vitamins which play a role in energy metabolism, and Vitamin C. GatorLode™ Drink Mix, the high carbohydrate beverage from the people who understand the needs of athletes, the makers of Gatorade® Thirst Quencher.

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To find out where GatorLode™ is available, or for product information, call 1-800-428-6000. In Indiana, call 317-543-5553.
claims. However, the FDA now has begun to consider ways by which food labels can be used to convey truthful, nonmisleading health messages. The FDA has developed tentative criteria to apply on a case-by-case basis to evaluate health claims. The basic problem is how to allow valid, appropriate health claims on foods without opening the door to misleading or fraudulent claims.

Opinions on health claims have been expressed by other government agencies such as the Federal Trade Commission, as well as representatives of the food industry, a consumer advocacy group, a trade association for dietary pattern over time that is important. Also, diet is just one of many factors that ultimately influences good health. Among the complexities or obstacles in implementing health claims on food labels are the amount and kind of scientific evidence necessary to substantiate such claims, the handling of conflicting claims (e.g., for a food with adverse as well as beneficial components), the difficulty in simplifying complex health messages to fit the limited space available on food labels, enforcement of claims, and the threat of "power races" among food companies to gain a competitive edge.

Although the outcome is unknown, health claims on food labels potentially can fulfill an important educational function. However, like nutrition labeling, they are not intended to stand alone. To maximize their effectiveness, health claims on food labels should be used in conjunction with other nutrition education efforts.

Musculoskeletal Examination Videotape Program Available
The American Academy of Orthopaedic Surgeons

"Physical examination of the Musculoskeletal System," a nine-topic step-by-step video teaching program, is now available for purchase from the Academy. The program is appropriate for students moving into an orthopaedic career or others whose ultimate practice will bring them into contact with a large number of patients with musculoskeletal complaints. Medical students and residents contemplating careers as emergency physicians, family physicians, and as pediatricians, as well as training programs preparing physical therapists, physician assistants and nurse practitioners will find the program useful.

The series was developed by the Academy, the Association of Orthopaedic Chairmen, and McGill University’s Instructional Communications Centre. The author of the programs is Larry B. Conochie, assistant professor, department of surgery, McGill University. Consultants for the series included MDs Newton C. McCollough, III, Phillip G. Spiegel, John B. McGinty and Raymond T. Morrissey. Individual program reviewers included MDs Richard I. Burton, William N. Capello, F. James Funk, Letha Y. Hunter-Griffin, Frank W. Jobe, Lowell D. Lutter, Thomas W. McNeill, and Andrew K. Palmer.

The program leads the viewer through a logical and complete approach to musculoskeletal system examination. An introductory videotape outlines pertinent aspects and techniques of the general musculoskeletal examination. Succeeding programs detail a systematic approach as well as specialized tests related to specific regions of the body. Illustrative pathology is included.

The programs are sold as a series only and cost $1,025 including shipping and handling. Multiple purchase discounts are available for institutions requiring more than one set of tapes. A preview program of excerpts from the series is available for a one-week loan in 1/2” VHS format. For further information, contact the Academy, 222 S. Prospect Ave., Park Ridge, IL 60068 or call (312)823-7186.

Ban on Smokeless Tobacco
Good Health Digest

If you’re planning a trip to Hong Kong, Ireland, Israel, or New Zealand, you won’t catch anyone chewing tobacco or pinching snuff. There’s a ban on the products in those countries, explains Nation’s Health.

Experts meeting at the World Health Organization suggest that the nations in which people do not already use smokeless tobacco should issue a comparable ban. Such a ban is necessary to prevent a new public health epidemic. Smokeless tobacco, including moist snuff, dry snuff, and chewing tobacco, has been linked to oral health problems, the most serious being oral cancer.
Abstracts

John Wells, ATC, PT, PhD


This particular injury was originally described in 1902 by Sir Robert Jones as a fracture of the proximal diaphysis of the fifth metatarsal. This study reported the non-operative treatment results of 10 Jones fractures involving eight males and one female patient, who had an average age of 24 years. Each fracture was classified as being acute or chronic based on the patient’s history, clinical examination and radiographs. The left foot sustained six fractures, while four fractures occurred to the right foot. Chronic fractures resulted from preseason participation in athletics, with primary symptoms of discomfort occurring when the athlete landed from a jump. Results of this investigation indicated that a short leg, non-weight bearing cast worn for nine weeks, until bony union of the fracture, was an effective adjunct in facilitating athletes to return to sports participation. An average of 47 weeks was required for radiographic union of acute fractures, while chronic fractures required 22 weeks for the same process. The authors believed from the results that Jones fractures without intermediary sclerosis could be treated non-operatively.

Louis W. Grant
Grand Rapid, MI


The authors reported the success of nonoperative treatment of isolated posterior cruciate injuries in an athletic population averaging 22 years of age. The authors indicated that disagreement existed in the literature about the importance of an intact posterior cruciate ligament to functional knee stability. This study was done to identify patients having acute isolated tears of the posterior cruciate ligament and determining the effect of nonoperative management upon total functional outcome of this lesion. The isolated PCL injury was studied in 13 patients, 6 males and 7 females. The diagnosis was established by arthroscopy, radiography, magnetic resonance imaging, and by clinical tests. According to the authors, hyperflexion of the knee was the most common mechanism of injury. Seven patients had mid-substance tears, while 5 had partial tears of the PCL. Direct visualization of the PCL using arthroscopy could not be achieved in one patient. Nonoperative treatment included a vigorous physical therapy program and isokinetic testing. Isokinetic testing demonstrated no significant differences in strength or fatigue of the involved or uninvolved knees of all patients. Additionally, the KT1000 evaluated AP excursion of both knees in 20 degrees of flexion. The results indicated that no discrepancy existed between the involved and uninvolved side in three knees, while a 5 millimeter or less discrepancy existed for nine patients. One patient had a 5 to 10 millimeter discrepancy. The authors’ results justified nonoperative treatment in the clinical management of patients having acute isolated tears of the posterior cruciate ligament, since all patients returned to their previous athletic activity.

Louis W. Grant
Grand Rapids, MI


The fractures most commonly associated with osteoporosis occur in the vertebrae, hip, and distal forearm. Among demographic characteristics, the important risk factors are increasing age, female sex, and the white race. Levels of endogenous estrogen appear to be positively associated with bone mass, as least in the years immediately after menopause. Increases in risk have been attributed to cigarette smoking, alcohol consumption, inadequate levels of vitamin D and its metabolites, low dietary calcium, caffeine consumption, high levels of dietary protein, and excessive phosphorus intake. The possible protective factors of greatest interest to the public are calcium intake and physical activity. Most randomized trials of calcium supplementation show a small protective effect against loss of bone mass. On the basis of current knowledge, then, estrogen replacement therapy by far is the most effective of the possible prophylactic agents.

Colin Daley
UNC Asheville


Exercise is one of many nonpharmacologic and non-immunologic stimuli that can produce acute episodes of airway constriction in patients with asthma. Unlike other types of provocations that function only periodically in the lives of patients with the disease, exercise is one of the most common precipitants of acute asthma encountered in clinical practice. The clinical features of exercise-induced asthma are quite characteristic. Patients sensitive to this stimulus can typically complete an exercise task without difficulty, when they stop however, progressive airway dysfunction develops. For the first few minutes after exertion they are usually asymptomatic, but within a short time they all have the classic signs and symptoms of acute airway narrowing. The severity of the obstruction is determined by the intensity of the exertion (specifically, the level of ventilation required to meet the metabolic demands of the task), the climatic conditions in which exercise is performed, and the underlying state of airway reactivity. For a given level of minute ventilation, inhaling cold or dry air amplifies the response. Alternatively, humidification of the inspirate reduces the response. For a given set of inspired-air conditions, high levels of ventilation result in more obstruction than do low levels. In exercise-induced asthma, the bronchial narrowing typically reaches its peak 5 to 10 minutes after exertion and then begins to remit spontaneously. Recovery is usually complete within 30 to 90 minutes, depending on the intensity of the initial reaction. As the airway narrowing lessens, the patient’s symptoms follow suit. This process can be accelerated by the admission of an inhaled sympathomimetic agent. Multiple causes of bronchial narrowing exist, and as yet no simple mechanism has been proposed that unified all of the clinical and physiological features of this illness. More studies that critically assess the pathophysiology of exercise-induced
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asthma will be required before all the relevant variables can be isolated.

Victor L. Rose
UNC Asheville


Many physicians have heard of patients who, although they experienced a cardiac arrest, at least were fortunate enough to have persons trained in Cardiopulmonary Resuscitation (CPR) nearby and lifesaving equipment rapidly available. Now, an effort is underway to provide equipment and training that might offer that lifesaving “right place, right time” chance to many more victims of a witnessed arrest. The key to this goal may be automatic external defibrillators that automatically analyze electrocardiographic signals. At an American Heart Association meeting in Monterey, California, Cummins, an assistant professor of medicine at the University of Washington, Seattle, discussed the rationale for also placing automatic external defibrillators in community settings for use by trained laypersons. He estimated arrests outside hospitals to as much as 50% or 70%. Objections to the use of automatic external defibrillators by laypersons have been raised. For example, could the machine miss a rhythm and an inappropriate shock be delivered? Cummins says that “The errors that have been made are in failure to diagnose ventricular fibrillation rather than an appropriate shock.” Could an inexperienced person confuse another condition with an arrest? The devices should be used only on pulseless, nonbreathing patients, Cummins says. In such a case, there are few rhythms encountered for which a countershock would be harmful. Despite these questions, the devices are beginning to be used on a non-experimental basis. Weaver says that automatic external defibrillators are standard equipment on three fourths of the fire engines in the Seattle area.

Colin A. Daley
UNC Asheville


The application of heat is considered an essential element in the management of many joint diseases. It is desirable to heat the specific joint structures in order to achieve maximum therapeutic response. It has been shown that various forms of energy sources may produce different temperatures throughout the tissues according to the depth of penetration. Indeed, when using an experimental model, Lehmann and associates have shown that ultrasound application could raise the temperature of the hip joint to the desired level, whereas microwave and shortwave diathermy have been unable to produce the intraarticular temperatures of 42-43°C. A new microwave device was recently developed by us for heating joint structures, such as capsular tissue and synovium, while sparing the skin. This new device has been used initially to produce hyperthermia in the prostate. The object of this study was to measure the temperature distribution throughout the anatomic joint structures and the adjacent tissues, in order to verify our preliminary results, i.e., that a special microwave device can produce intraarticular temperatures of 42-43°C with minimal effect on the surrounding tissues, thus providing a modality which can be used in patients with various arthritides. This study demonstrated that the recently developed hyperthermic equipment is effective in achieving increased temperatures within the joint cavity of up to 42-44°C, using a small amount of energy only, while keeping both the skin above the joint and the adjacent tissues cool and protected.

Brian W. Jansen
UNC Asheville


Intubation, external trauma, and surgical manipulation, all put stress on the trachea. Only a few individuals, however, suffer complications from these stresses severe enough to require consultation or treatment. When problems do occur, the scarring and stenosis of the airway can be serious enough to threaten the patient’s life. Performing a tracheal resection, combined with laryngeal release and flexion of the neck, has permitted us to re-establish the airway in a large majority of affected patients. Clinically, after tracheal injury or intubation, almost all patients have decreased exercise tolerance, progressive stride, or pneumonia, and/or the ability to clear secretions past the stenotic segment. Symptoms usually appear gradually during a period of weeks or months, although the respiratory status in some patients may deteriorate markedly during a few days. Most patients have normal laryngeal functions. A high tracheotomy, careless surgical technique, excising portions of cartilaginous tracheal rings, excessive cuff pressure, and infection can all cause problems. Fortunately the human trachea is quite resilient. Furthermore, some tracheal stenosis cases could have been avoided by more careful attention to proper cuff pres-
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Book Reviews
Science of Stretching
Michael J. Alter, MS.
Human Kinetics Publisher, Inc.
Box 5076
Champaign, Illinois 61820
256 pages; Illustrated
Price: $26.00

Athletic trainers have long realized the importance of
proper stretching before and after performing athletic
skills. We have all been placed in situations where we
would have liked to have a clear and concise program to
give our athletes, but it usually was a long task taking a
page from one book, an illustration from another. This
problem has been solved by Michael Alter in his recently
published book entitled Science of Stretching. This text
is more than the average stretching book. It’s an in-
depth exploration of the scientific basis of stretching as
well as a complete guide for coaches, athletic trainers
and sports medicine professionals seeking to build
stretching and flexibility programs. He goes into great
detail explaining the principles and techniques of
stretching and points out in greater detail the anatomy
of muscles and connective tissues. Through illustrations,
diagrams, charts, and figures, he explains clearly the
physiology, neurophysiology, mechanics, and the psy-
chology of the art and science of correct stretching. The
author then goes one step further and presents practical
guidelines for developing a flexibility program, including
200 stretching exercises and warm-up drills.
The text is divided into three parts: Part one deals with
the factors related to flexibility and stretching; part two
is devoted to an interesting section on functional
anatomy; part three explains and illustrates flexibility
and warm-up programs. The three parts are blended into
an interesting and valuable tool which can be used
everyday by all those coaches and sports medicine
professionals who are tasked with the job of developing
and explaining stretching to athletes at all levels of
competition.

Michael Alter has given us a text at a fair price which
in the future all other stretching books or manuals will
be compared to for quality of authorship. I strongly
recommend this fine work for everyone who is concerned
with good sound stretching program development. In
closing, thank you, Michael Alter, for authoring such a
book and thanks Human Kinetics for publishing the
work.

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ATHLETIC TRAINING
THE JOURNAL OF
THE NATIONAL ATHLETIC TRAINERS ASSOCIATION, INC.

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Current Literature

Brian Barry, ATC, MA


Sports Injuries in Women: A One-Year Prospective Follow-up Study at an Outpatient Sports Medicine...
The **AIR-STIRRUP** Ankle Brace resists inversion, permits normal flexion, while aircells squeeze swelling away.

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**PROTECTED FUNCTION**

References: Please call 800-526-8785 for reprints and further information.

US PATENTS 3,955,565, 4,280,489, 4,297,920, 4,628,948 and 4,628,945.
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The Tennis Elbow Brace is not a means to prevent tennis elbow; it is used to prevent the condition from getting worse and to reduce the pain of the condition.

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Oklahoma State University
Press Release
March 15, 1988

STILLWATER — Kaye Barrett Droke, Arlington, Texas, will be inducted into the Oklahoma State University Alumni Hall of Fame on March 18 in Stillwater.

Droke is founder and president of Champion Sports Nutrition. She holds memberships in Sales & Marketing Executives International, the Branch Rickey Association of the Fellowship of Christian Athletes, the Arlington Women's Club, and the National Development Council at the University of Arkansas. In addition, she is an annual sponsor of the FCA Breakfast at the U.S. Track Coaches national meetings. She frequently lectures on nutrition at local, regional and national sports clinics, and is an organizer and past president of the South Central Foods Association.

The Mansfield, Texas native attended OSU in 1941 and 1942 majoring in business. She is a Life Member of both the OSU Foundation's Henry G. Bennett Society and the OSU Alumni Association. She was the first woman to serve on the OSU Foundation Board of Governors. In 1977, Droke was honored with the OSU Distinguished Alumnus Award presented by the Alumni Association. She currently sponsors OSU's Outstanding Track and Field Award and the Outstanding Scholar-Athlete Award as well as the Kaye Barrett Droke President's Distinguished Scholarship. In 1981, Droke was honored for her contributions to the OSU track program during ceremonies dedicating the Kaye Barrett Droke Track and Field Center. She and her husband, James, maintain homes in Texas and Fayetteville, Arkansas.

NATA Exhibit Helps Build Rapport With School Administrators

Dozens of athletic trainers have donated some of their “spare time” to the NATA public education program in recent years, which has translated into hundreds of news stories regarding the need for qualified health care professionals in the majority of U.S. high schools. Those stories have, in turn, been cited time and again for stimulating discussion among school administrators and school board members about ways to reduce sports injuries.

But while news accounts and research results have supported the need for more certified athletic trainers in secondary schools, the NATA knows nothing works like the personal touch.

The NATA decided eight years ago that its top priority for the 1980's was improving health care in high school sports. NATA executive director Otho Bavis and then-president Bill Chambers devised several ways to reach key audiences in the secondary schools, one being an NATA trade show exhibit. Their next decision was to ask Bill Prentice to represent the NATA at the booth.

"The primary reason we assembled a convention booth was to increase the visibility of the athletic trainer to key individuals responsible for hiring an athletic
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trainer at the secondary school level," said Prentice, who has voluntarily managed the traveling booth at two annual conventions since 1981.

Illinois Athletic Trainers Association members Brian Robinson, Brian Katzman and Carol Humble volunteer their time to staff the NATA's convention booth at the National Conference of High School Directors of Athletics in Chicago. The NATA specifically targets secondary school administrators for the booth's three annual appearances. (left to right: Humble, two visitors, Katzman and Robinson)

"The booth allows the decision makers—high school superintendents, principals and school board members—the opportunity to learn more about who we are, what we do and methods by which they can have an athletic trainer at their school," Prentice added.

Prentice, an assistant professor and coordinator of Sports Medicine at the University of North Carolina at Chapel Hill, estimates 15,000 people attend the annual American Association of School Administrators and the National School Board Association meetings each year. And in January of this year, the booth made its first appearance at the National Conference of High School Directors of Athletics.

"Many athletic directors are interested in hiring an athletic trainer, but they need more information," said Mike McCormick, head athletic trainer at DePaul University and public relations director for the Illinois Athletic Trainers Association. McCormick and members of the IATA volunteered their time to staff the booth at the three-day convention.

"We tried to offer athletic directors creative ways to hire an athletic trainer, some alternative to the normal teacher-trainer system, which some feel they cannot afford," McCormick said. "Athletic directors often have the inside track to hiring an athletic trainer. Some will work to increase our presence at their schools, provided we give them what they need to do the job. It's very important to have them on our side."

"Athletic training positions at the high school level have dramatically increased in the past five years, due in part to the efforts of people like Bill Prentice," said Otho Davis, who allocated $2,000 last year for improvements to the booth.

Prentice used the funding to upgrade the quality of the NATA booth with a video cassette recorder, color monitor and new color photographs. Visitors to the booth now view NATA public service announcements featuring Dallas Cowboys head coach Tom Landry, CBS commentator Dick Vermeil and a variety of television news stories on the NATA. Prentice also keeps on hand the 24-minute film documentary entitled "The Injury Factor" for those who wish to get the full picture.

Prentice said the need for certified athletic trainers is becoming more evident to school administrators.

"In 1987, I took the same number of brochures I've always taken to the (three-day) National School Board Association meeting," Prentice explained. "But the interest and the traffic through there was so great, by noon on the first day, my entire supply of brochures was exhausted."

Prentice added that administrators are becoming more sophisticated.

"When we started out, the questions were about what an athletic trainer is," he said. "Then they were asking how the schools can find the funds to pay for one. Now administrators want to know where to find an athletic trainer. It's a great feeling to see how we've evolved over the years through the eyes of people attending these meetings."

Otho Davis says it's a great feeling to see so many athletic trainers dedicated to the growth of their profession. ©

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## Continuing Education

**Attention: Certified, Associate, 4C and 4B Members**

Please read your Continuing Education Requirements brochure which states: The trainer is responsible for sending to the Continuing Education Office PROOF of completion of any Continuing Education Units (CEUs) and activities to be used in updating his/her record in a required period of THIRTY DAYS after completing the activity.

## Journal

### Journal Replacement Policy

The Policy for handling claims for missing Journals due to address change is based on the stipulation that the notice of change of address be received in the National Office at least 30 days prior to publication, in order for the member to receive a gratis replacement Journal. If the member did not meet the “30 day” requirement, or did not authorize the post office to forward Second Class mail, then the responsibility for not having received the Journal rests with the member and a minimum replacement charge is made. **New members** and Reinstated members do not receive back issues published before their membership was validated. **New members** will receive the first issue published after NATA membership is in effect. **Reinstated members** (previously deleted due to nonpayment of dues) will receive the first issue published after confirmation of reinstatement is issued from the Membership Office.

**NATA members who do not receive their Journals should check with the Membership department of the National Office to determine if the membership roster reflects an incorrect address.**

## Membership

If you are a Certified or Associate member with one of the Student classifications, you are required to submit documentation of your continued enrollment in school. This is an annual requirement. Ideally, the documentation should be received in the National Office by September of each year before the October billing statements are mailed.

It is not necessary for NATA members to submit a new application for membership every year. Your membership is renewed when you pay your annual dues. Please designate “Membership Office” on the outside of your envelope.

### POLICY 6 WORTHLESS CHECKS

Anyone submitting a check which for any reason is returned worthless to either the National Office, Journal Office, or District Secretaries will be charged an administrative fee of $20.00 in addition to the original amount of the check.

## Schedule of Sites and Dates

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Public Relations

Picture Brightens; But Injuries To Prep Football Players Still at 37%

For the second straight year, 37 percent of more than one million high school football players in the U.S. were sidelined by injury, according to the National Athletic Trainers' Association.

Of the estimated 1,021,000 youngsters who played high school football during the 1987 season, 374,678 sustained at least one time-loss injury. The NATA projected national figures from its survey of 7,886 players at 134 high schools across the U.S.

When multiple injuries are included, the study indicates more than 516,000 football-related injuries occurred last year.

A five percent increase in major injuries, those that sideline a player for three weeks or more, belies an otherwise improving picture for high school football. The overall injury toll dropped 19 percent according to the survey, from 636,239 in 1986 to 516,716 last fall.

"We projected 21.7 percent fewer minor injuries, which accounted for most of the decrease," said NATA research director John W. Powell, Ph.D., an associate professor at San Diego State University.

Powell said the cyclical nature of injuries may account for part of the reduction, but cautioned that "real injuries" may not have decreased as much as the survey indicates.

"Results from the second year of similar studies we did in college and professional football also showed a decrease," Powell explained. "We have reason to believe it is more a reflection of record-keeping than a reduction of injuries. The actual injury toll is probably somewhere between what we projected last year and this year."

NATA executive director Otho Davis said another reason for fewer injuries may be that a growing number of coaches and school administrators are better informed today.

"Last year's survey, the first in-depth study ever done at the high school level, dispelled some myths and brought the injury issue into focus," said Davis, who is also head athletic trainer for the NFL's Philadelphia Eagles.

On balance, the 1987 study verified most of what was reported last year:

- Sixty percent of all football-related injuries occurred in practice in 1987; 62 percent in 1986.
- Sprains and strains accounted for 49 percent of the injuries in 1987; 49.5 percent in 1986.
- Running backs remained at the highest risk of injury again in 1987 with 7.9 injuries per 100 games; quarterbacks were second, as in 1986, with 5.1 injuries per 100 games.
- There were 13,612 football-related surgeries in 1987; 14,380 in 1986. Of all surgeries, 77 percent were knee-related in 1987; 69 percent in 1986.

Powell cited what is perhaps the most significant concern about the NATA study. Nationwide projections are based on 134 schools with certified athletic trainers, college educated professionals who are trained to minimize the impact of injuries. Fewer than 15 percent of 20,000 U.S. high schools with athletic programs have certified trainers.

"We aren't able to say with certainty that schools without trainers have a higher incidence of injury," said the NATA's Davis. "But I think it's a logical assump-
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tion. We'll try to get a better handle on that in 1988,"

Major injuries, like fractures and knee damage, incapacitated 57,241 prep football players in 1987, compared to 54,407 the previous year. Moderate injuries, which precluded participation for eight to 21 days, sidelined 86,028 players in 1987, compared to 104,959 a year earlier.

The typical American high school with a football program had 69 varsity and junior varsity players. Each school sustained, on average, 35 time-loss injuries in 1987, according to survey results. Of those, 25 were minor injuries, six were moderate and four were major injuries.

The NATA will conduct a third survey of high school football injuries during the 1988 season to identify what Powell calls "verifiable trends" and help establish guidelines for injury prevention programs.

NATA Members Have Plenty to Say at "1990's" Symposium
John LeGear

"Athletic Training in the 1990's," the 90-minute symposium introduced this year to open lines of communication between NATA officers and the Association's 10,000 members, took the form of an animated town meeting at all five district meetings held in January and March.

Nearly everyone attending the district meetings in Monticello, New York, Indianapolis, Albuquerque, Lincoln, Nebraska and Eugene, Oregon, crowded into meeting rooms to hear about the NATA's goals and strategies for the next decade. Brief presentations by NATA Executive Director Otho Davis, President Jerry Rhea, Paul Grace, Chairman of the Board of Certification, and district representatives followed a nine-minute video presentation on the future of the profession.

The membership watched with interest as each district director, serving as moderator, posed questions ranging from salaries to licensure to a blue ribbon panel of national and district leaders. It wasn't until the second half of the program, however, when members were invited to query the panel, that the 1990's program fulfilled its promise.

"It's an exciting open forum of ideas," said Jerry Rhea, moments after fielding a series of questions relating to women's increasing role in athletic training. "We're probably learning more from our members than they're learning from us."

The 1990's program, which is sponsored by the Athletic Products Division of Johnson & Johnson, was conceived to offer members an opportunity to shape their profession.

"Every aspect of health care in this country is undergoing transformation," explained Otho Davis, who has served as Executive Director of the NATA since 1971.

"While we've done well to keep pace with most of the changes that affect us, there are issues relating to job security, employment opportunity, quality assurance and dozens more that confront our Board of Directors. The 1990's program enables us to learn more about how our members feel about those issues."

"It was great to exchange ideas with the leaders of our profession," said Travis Frederickson, head athletic trainer at Alhambra High School in Phoenix and a member of District Seven. "I wish the discussion would have been extended another three hours. We wouldn't have had any trouble filling the time."

A light moment at the "1990's" program in District 10 was shared by (from left) NATA Executive Director Otho Davis, Board of Certification Chairman Paul Grace, District 10 secretary Tom Koto, Pacific University head trainer Susan Decker and NATA president-elect Mark Smaha, who served as moderator on the program.

Capacity crowds at all five district meetings gave NATA members an opportunity to express concerns about the future of their profession in the "Athletic Training in the 1990's" program.

"I think it was one of the best sessions we've had at the District Four meeting," added Dennis Helwig, head trainer at the University of Wisconsin. "It gave people the opportunity to express a variety of opinions about issues that confront them every day."

District One Director Charles Redmond agrees the 1990's program serves two purposes.

"It gives members direct input to the Board of Directors, which is ultimately responsible for the future of the profession," Redmond said. "Very few associations provide their membership with that kind of opportunity."

"But it also enables the Board to make more informed decisions," Redmond added. "I believe it will have a positive impact on the Board when we convene again in June."

"Athletic Training in the 1990's" will be presented at the four remaining district meetings in June and July. All district members are invited to attend and participate.
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**District Three Meeting**
Saturday, June 11, 1988 at 3 p.m.
The Omni Hotel
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**District Eight Meeting**
Sunday, June 26 at 9 a.m.
The Exhibit Hall
Hotel Queen Mary
Long Beach, CA 90801

**District Nine Meeting**
Wednesday, July 13 at 10 a.m.
Convention Center
The Quality Inn
East Ridge, TN 37411

**District Six Meeting**
Friday, July 22 at 10 a.m.
Room E-2
Arlington Convention Center
Arlington, TX 76001

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**Study Shows 35 Football Injuries Per School Under ‘Good’ Conditions**

Results of a study released in January by the National Athletic Trainers’ Association indicate more than 500,000 injuries occurred in high school football last fall. The injury report reflects a ratio of one time-loss injury for every two prep football players in the U.S., an improvement over 1986 figures. But athletic trainers are concerned the injury situation may be worse than it appears.

"Injuries are an inevitable result of contact in most sports at any level," said Jerry Rhea, president of the NATA. "The good news from the 1987 study was the report of fewer injuries than in 1986."

"The flip side is that this study reflects only schools where certified athletic trainers manage injury prevention programs. Eighty-five percent of high schools don’t have a certified health care professional in their athletic program to treat and rehabilitate injuries," said Rhea, who is also head athletic trainer for the NFL’s Atlanta Falcons.

An average of 35 football-related injuries occurred in 1987 at each of 14,836 U.S. high schools, according to the study. Of those, 25 were classified as minor injuries, six were moderate, and four were major injuries that precluded participation for three weeks or more.

"We recorded six fewer injuries per school in 1987 than in 1986," said John W. Powell, Ph. D., who directed the NATA study at San Diego State University. "That can be attributed in part to the cyclical nature of sports injuries, and perhaps to more accurate evaluation of injuries reported.

"Unfortunately, we can’t compare injuries at schools with athletic trainers to schools without them," Powell said. "Schools without certified athletic trainers rarely keep record of all the sports-related injuries that occur."

Having supervised injury surveillance studies in college and professional football during the past decade, Powell said he is closer to arriving at "the irreducible number of football-related injuries" that occur each year.

"If the endemic level of risk associated with high school football is not 35 injuries per school, it may be 34 or 33," Powell said. "We should be able to establish more clearly what that number is after next year’s study."

Powell and another researcher at San Diego State University, William H. Edwards, Ph.D., compared findings from the NATA’s 1986 and 1987 football studies to their broad-based study of college football injuries conducted between 1975 and 1983. They based comparisons on game-related injuries per thousand exposures for varsity players only. Here’s what they found:

- The risk of injury during practice is about the same in high schools as in college.
- The risk of injury is four times higher in a game than in practice at the high school level; eight times higher in a game than in practice at college.
- Based on projections from their 1986 and 1987 studies, the average high school football program will experience about one surgery per year and, of those, two knee surgeries every three years. The average college football team will experience 2.5 knee surgeries per season.
- Overall, despite the fact the average college football team plays only one more game (11) per year than the average high school team, the risk of sustaining a game-related injury is twice as great in college than in high school.

Don’t be deceived by the comparison of injuries in high school to college, however, warned the NATA’s Rhea. "College athletes are getting some of the best health care in the country today," Rhea said. "We can’t say the same for most high school kids, at least not yet."
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**NHSIR Methods: How NATA Measures Number and Severity of Injuries**

John W. Powell, PhD  
William H. Edwards, PhD

The National High School Injury Registry (NHSIR) is a large-scale data gathering mechanism concerned with sports-related injuries in six scholastic sports, primarily football and basketball.

It was designed in 1985 and first implemented in 1986 to enable on-site recorders to determine the risk of injury to secondary school students participating in interscholastic sports. The National Athletic Trainers’ Association requested development of the NHSIR system to more clearly establish the risk of injury to high school athletes.

Skilled paramedical professionals are required to record injury-related data. During the 1987 football season, the NHSIR received data from 134 high schools that employ a full-time certified athletic trainer. The educational and clinical background of these professionals, which includes specific training in injury prevention and medical record-keeping, providing a high degree of reliability.

The sample of 134 schools is stratified geographically. It represents secondary schools of all sizes and nature (public and private) with 11-man football programs.

Injury data was recorded daily and submitted weekly to the NATA research team at San Diego State University. Numerical medical codes were provided for a common definition of injuries. Timely recording and processing helped keep summary tables up-to-date, enabled the research center to flag inconsistencies, and allowed time for verification.

Information gathered included type of session (practice or game), type of injury, degree of injury, level of participation (varsity or junior varsity), the number of participants in each session and the type of condition of the surface on which teams were exposed. In addition, data included the date of injury and when players resumed participation, a clinical evaluation of the injury, the player’s position, the situation at the time of injury, and the extent of the injury (new injury or re-injury, surgeon or permanent disability).

To capture more routine variables that could be associated with risk, specific information was recorded for inclusion in the data analysis. These variables included players’ height, weight, age, level of education, and years of football experience. Knowing these factors as they relate to injury allowed for the development of risk patterns associated with individual physical characteristics.

Maintaining the NHSIR system required considerable time and attention to detail on the part of on-site recorders. Certified athletic trainers who participated in the system were rewarded by the NATA with continuing education credits.

In June, 1988, the NATA will announce results of NHSIR findings pertaining to high school basketball injuries.

The NATA has approved funding for continuing research with the NHSIR system through the 1988-89 school year. ©

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Walter (Doc) B. Bakke passed away at the age of 88 on December 27, 1987 in Madison, Wisconsin. A former president of the NATA, Doc served his profession in a multitude of areas.

Born in Mayville, North Dakota, Doc grew up in Sterling, Colorado where he was a three-sport competitor in high school. He went to the University of Illinois and played center on the 1918 and 1919 football teams. He served as a coach and physical education director in Denver in the early 1920's before returning to Illinois to become an assistant trainer. In 1930, he became head trainer at Ohio State and during the summer was trainer for the Columbus baseball team. He also spent one spring as a trainer with the St. Louis Cardinals and served four years as trainer for the Madison Mustangs. For 30 years, Walter served as athletic trainer at the University of Wisconsin, from 1936-1966.

Walter was trainer for the US Olympic team in Rome. In 1965 he received the Helms Foundation Hall of Fame Award. He was a member of various civic organizations.

He is survived by his wife, Margorie; a sister, three sons, three stepdaughters, 14 grandchildren, and two great-grandchildren.

Memorials may be made to a scholarship to be established in his memory.
James E. Lester passed away last July at the age of sixty. After attending high school in Old Town, Maine, he received his undergraduate degree in physical education from Boston University.

Jim was a charter member of the Eastern Athletic Trainers’ Association and started out his career as an assistant athletic trainer for Harvard University and the Boston Red Sox. Then he began his long association with the Massachusetts Institute of Technology, where in 1984 Jim retired as Senior Athletic Trainer after 27 years. He also volunteered his time to work with the Bay State Games of Massachusetts.

M.I.T. recognized they had lost a very special person in Jim. In his honor, the Class of 1986 established the James E. Lester Award to be presented to a professional member of the Department of Athletics who exemplifies exceptional service to the students.

Jim is survived by his wife Norma, their two children, and two grandchildren.
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NATIONAL ATHLETIC
TRAINERS’ ASSOCIATION

February 20-22, 1988
Sheraton Park Central Hotel
Arlington Texas
and
Four Seasons Hotel
Austin, Texas

SUMMARY OF ACTIONS
BOARD OF DIRECTORS

The following agenda items were considered and
actions taken by the NATA Board of Directors at its
meetings held at both the Sheraton Park Central
Hotel, Arlington, Texas and the Four Seasons Hotel,
Austin, Texas, commencing at the Sheraton Park
Hotel, Arlington, Texas, at eight-thirty p.m., February
20, 1988 and terminating at the Four Seasons Hotel,
Austin, Texas, on Monday, February 22, 1988, at
eleven-thirty o’clock p.m., with the following in at-
tendance:
Mr. Mark Smaha, President
Mr. Otho Davis, Executive Director
Mr. Kim Zeitlin, Attorney
Mr. Charles Redmond, District 1
Mr. Joseph Godek, District 2
Mr. Terry O’Brien, District 3
Mr. Dennis Miller, District 4
Mr. Jerry Weber, District 5
Mr. Paul Zeek, District 6
Mr. Mike Nesbit, District 7
Ms. Janice Daniela, District 8
Mr. Bobby Barton, District 9
Mr. Mark Smaha, District 10

NOTE: Both Mr. Rhea, President and Mr. Smaha, Vice
President being absent at the opening session, the
Board approved Mr. Bobby Barton to preside at the
session. Mr. Smaha and Mr. Rhea were subsequently
present at the Sunday session, with Mr. Rhea then
presiding for the balance of the meeting.

I. APPROVAL OF INFORMATIONAL ITEMS:
The following reports containing no recommenda-
tions or requests for action were, in accordance with
motion made by District 5, seconded by District 6
and carried, accepted as information:
Grants and Scholarships
High School Professional Athletic Trainers
Journal
Licensure
Membership
Memorial Resolutions
Placement
Research and Injury
American College Health Association
American Orthopaedic Society for Sports Medicine
American Physical Therapy Association
National Operating Committee on Standards for Athletic Equipment
National Commission for Health Certifying Agencies
AASA and NASB School Administrators and School Boards
Athletic Training Services, Inc.
Canadian Athletic Therapist Association
International Management Group

II. REAPPROVAL OF MAIL ITEMS:
Moved by District 8, seconded by District 7
and carried that the previous approval of mail and tele-
phone votes be reaffirmed.

III. NO ACTION - NO REPORT SUBMITTED:
The Board, as a point of information, was informed
that no reports or no requested actions were requested
from the following:
History and Archives
Publications
American Academy of Family Physicians
American Academy of Pediatrics
AAHPERD
American College of Sports Medicine
American Corrective Therapy Association
American Running and Fitness Association
National Academy of Sports Vision
National Association for Girls and Women in Sports
National Association of College Directors of Athletics
National Association of Intercollegiate Athletics
Vice President
Executive Director
Schering Symposium
Splinter Groups

IV. AUDIOVISUAL AIDS COMMITTEE:
The Board, in considering the various recommenda-
tions presented by this committee, acted as follows:
 CONCERNING RECOMMENDATION NUMBER TWO — THAT ALL
DISTRICT REPRESENTATIVES OF THIS COMMITTEE HAVE THEIR
OWN PERSONALIZED STATIONARY/ENVELOPES IDENTIFYING
THEM AS COMMITTEE MEMBERS, IT WAS MOVED BY DISTRICT 8,
SECONDED BY DISTRICT 7 AND CARRIED THAT THIS REQUEST
BE TABLED.
Because of lack of necessary information, by con-
sensus, the Board agreed to delay for subsequent mail
vote, the nomination of Jeffrey C. Frechette of Dart-
mouth College, as District 1 representative to this
committee.
Moved by District 4, seconded by District 3 and
carried that all committee members for the 1988
positions be approved.
Moved by District 8, seconded by District 3 and
carried that the recommendation to develop an NATA
library of video tapes and other audiovisual aids that
would be suitable for CEU credit be tabled, with a
request for additional information relative to mechan-
ics and cost.
Moved by District 4, seconded by District 5 and
carried to table the recommendation of the committee
to direct both the National Convention Committee and
the Local Convention Committee to place the Audio-
visual Media Room closer to the lecture and exhibit
areas at the National Convention.

V. CAREER INFORMATION AND SERVICES:
Moved by District 8, seconded by District 3 and
carried to approve all committee members for the 1988
positions.
Moved by District 8, seconded by District 3 and
carried that the recommendation to develop a career
information packet be tabled, with a request for addi-
tional information relative to mechanics and cost.
Moved by District 4, seconded by District 5 and
carry the report of Mr. Grace be accepted as information.

VI. NATIONAL COMMISSION FOR HEALTH CERTIFYING AGENCIES:
Mr. Grace presented a brief report concerning the
ongoing activities of this group following which it was
moved by District 4, seconded by District 5 and carried
that this report be accepted as information.

VIII. CLINICAL/INDUSTRIAL/CORPORATE ATHLETIC TRAINERS:
Moved by District 8, seconded by District 3 and
carried that the names of committee members recom-
manded by the Committee Chairman be approved.

IX. CONTINUING EDUCATION:
Moved by District 8, seconded by District 1 and
carried that the verbal written report presented by the
Chairman of this Committee be approved.

X. DRUG EDUCATION:
Moved by District 4, seconded by District 3 and
carried that the October 14th report of the Chairman of
this Committee be accepted.

XI. ETHICS:
The Board, without action, noted the brief report
submitted by the Chairman of this Committee and
mainly his comments that with the new membership
sanctions and procedures and the review of certifica-
tion and disciplinary procedure having been written
and put into force, that the old reputation concerning
ethical matters was reestablishing itself.

XII. NUTRAMENT TRAINER OF THE YEAR:
Moved by District 8, seconded by District 4 and
carried, with District 7 being in opposition, to adopt the
suggested time table for the selection of the Nutrament
Trainer of the Year.

XIII. HONORS AND AWARDS:
Moved by District 8, seconded by District 1 and
carried that Mr. Sullivan’s report be accepted for
informational purposes.

XIV. HALL OF FAME:
Following a brief discussion as to the possibility of
awarding Hall of Fame nominees some more tangible
form of recognition than merely entry into the Hall of
Fame, it was moved by District 7, seconded by District 3
and carried that an investigation be made into the
process of design of a suitable ring for these individuals
and subsequent report back to the Board.

XV. LICENSURE:
Moved by District 1, seconded by District 10 and
carried that Mr. Crowley’s report be accepted as
information.

XVI. MEMORIAL RESOLUTIONS:
Following consideration of a proposal concerning
memorial resolutions and the indication that more
detailed information was desired, it was moved by
District 8, seconded by District 10 and carried that
further consideration of this issue be tabled until
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further information could be furnished by Mr. Yates, this information including Index Medicus requirements.

XXV. MINORITY ATHLETIC TRAINERS:

It was moved by District 6 that the Board accept the request for $250 for the purpose of issuing a newsletter. There being no second, the motion was declared dead for want of a second.

Moved by District 3, seconded by District 4 and carried that the Minority Trainers review the content of the current high school curriculum programs for achieving trainer status with input from the Careers Information Committee and Certification Committee.

XXVI. STUDENT TRAINER AWARDS BANQUET:

that more information was required before the Board report involving activities since the last meeting and from an outside agency concerning the production of a calendar, it was moved by District 6, seconded by District 8 and carried that the matter be tabled for the present.

Moved by District 7, seconded by District 10 and carried that the NATA pay the required $100 dues fee to the Commission.

XXI. N.C.A.A.:

Moved by District 3, seconded by District 4 and carried that the NATA pay the required $100 dues fee to the Commission.

XXII. N.S.C.A.A.:

Moved by District 1, seconded by District 2 and carried that the NATA establish liaison with this group.

XXIII. AMERICAN TRAUMA SOCIETY:

Moved by District 8, seconded by District 3 and carried that the NATA establish liaison with this group.

XXIV. MEMBERSHIP DIRECTORY:

Moved by District 2, seconded by District 10 and carried that Mr. Davis be authorized to look into details concerning the publication of a membership directory at a reasonable price.

XXV. HIGH SCHOOL STUDENT TRAINER COMMITTEE:

In accordance with a recommendation submitted by this committee, it was moved by District 6, seconded by District 9 and carried that Mr. Tim Richards from District 10 be made a member of this committee.

XXVI. STUDENT TRAINER AWARDS BANQUET:

Moved by District 7, seconded by District 9 and carried that Mr. Davis be authorized to look into details concerning the publication of a membership directory at a reasonable price.

XXVII. VIDEO TAPE CONCERNING AEROBICS:

Mr. Davis called attention to correspondence received from an outside agency concerning the production of a video tape on aerobics. A brief discussion indicating that more information was required before the Board could make an intelligent decision on this matter, it was moved by District 6, seconded by District 8 and carried that the matter be tabled for the present.

XXVIII. NATA FINANCIAL REPORT:

Following a detailed presentation of the financial report involving activities since the last meeting and contemplated projections for the balance of the year, it was moved by District 7, seconded by District 9 and carried that this report be accepted.

It was further moved by District 7, seconded by District 6 and carried, at the suggestion of Mr. Mcintyre, that the payroll writing procedure now be handled by his office, be transferred to another firm and that Mr. Davis be given authority to proceed with the selection of another accounting firm and also the preparation of the necessary bank resolution for changing of present signatures.

XXIX. NATA FOUNDATION FINANCIAL REPORT:

Following a brief presentation by Mr. Mcintyre concerning the current financial status of the NATA Foundation, District 9, seconded by District 8 and carried that this report be accepted.

XXX. HALL OF FAME FINANCIAL REPORT:

Mr. Mcintyre indicated that no funds had been transferred to the Hall of Fame as yet due to there being no need for them at this time.

Mr. Zeitlin indicated the recognition on the part of the IRS of the Hall of Fame as a tax exempt entity, commenting further on the value of this status to the Hall of Fame. It was moved by District 5 and seconded by District 9 that this report be accepted.

XXXI. NATA GRANTS AND SCHOLARSHIPS FOUNDATION:

Concerning the election of officers, it was moved by District 9, seconded by District 8 and carried that the officers for this organization be those as those for NATA, Inc., with the inclusion of the Executive Director, Mr. Davis.

Upon the request of Mr. Zeitlin, it was moved by District 8, seconded by District 6 and carried to adopt the necessary resolution for the opening of a bank account for this Foundation.

Moved by District 9, seconded by District 8 and carried that the NATA establish liaison with this organization.

It was moved by District 9, seconded by District 10 and unanimously carried that the following resolution be adopted:

BE IT RESOLVED THAT: The Board of the National Athletic Trainers Association Grants and Scholarships Foundation, Inc., shall now require that individuals who are identified by the Grants and Scholarships Foundation, Inc., as deserving of a grant or scholarship for application toward tuition or related expenses at an accredited college or university must enroll in such a institution within two (2) years of such recognition by the Grants and Scholarship Foundation, Inc., and

BE IT FURTHER RESOLVED THAT: Persons previously identified as deserving of scholarships and grants who have not yet met the condition of enrollment at an accredited college or university, be notified that they must meet said condition by March 1, 1990.

Moved by District 2, seconded by District 9 and unanimously carried that the following resolution be adopted:

BE IT RESOLVED THAT: The Board of the National Athletic Trainers Association Grants and Scholarships Foundation, Inc., hereby establishes the Advisory Council of the National Athletic Trainers Association Grants and Scholarships Foundation, Inc. The Advisory Council shall evaluate applications for grants and scholarships and recommend for Board approval recipients to be granted such awards and

BE IT FURTHER RESOLVED THAT: The President of the National Athletic Trainers Association Grants and Scholarships Foundation, Inc., with agreement of the Executive Director and approval of the Board shall appoint a Chair of the Advisory Council to serve for a term of two years who will act as agent for the Board in establishing a bank account and writing checks as directed by the Board. The Chair shall be appointed, with the approval of the Board, persons who shall serve on the Advisory Council for a term of one year. The term of the Chair and other members of the Advisory Council may be renewed without limitation subject to Board approval. The initial Chair shall be Mr. Frank George.

Moved by District 9, seconded by District 1 and unanimously carried that the financial statement for this Foundation be accepted.

XXXII. JAPAN RECOGNITION AND LIASON:

After listening to the request of Mr. Kazuo Watanabe from the Goto Gakuen College in Japan, it was moved by District 8, seconded by District 9 and carried, with Districts 1 and 2 abstaining, that this College of Medical Arts be recognized as the first university in Japan teaching Athletic Trainers.

Moved by District 4, seconded by District 10 and carried that a special subcommittee of the Professional Education Committee and the Certification Committee be directed to assist this Japanese University in meeting NATA requirements as contained in the A.T.P. and/or NATA approved curriculum.

XXXIII. MEMBERSHIP DIRECTORY:

Moved by District 1, seconded by District 8 and carried that the Executive Director be given authority to begin publication of a Membership Directory, providing an acceptable proposal can be arranged for the underwriting of this directory, this authority being granted to Mr. Davis without the necessity of him again coming back to the Board.

It was further moved by District 2, seconded by District 8 and carried that the Membership Directory, if published, be provided to the members at a cost of no more than five dollars.

XXXIV. HIGH SCHOOL PROFESSIONAL ATHLETIC TRAINERS:

Moved by District 9, seconded by District 10 and carried that this report be accepted as information.

XXXV. NATIONAL HIGH SCHOOL ATHLETIC COACHES ASSOCIATION:

Mr. McDonald, Executive Director of this organization, informed the Board as to the great lack of athletic trainers at the high school level, urging the NATA to cooperate with this organization in helping, through education and certification of more athletic trainers, toward the filling of this present gap at the earliest possible moment.

Moved by District 10, seconded by District 4 and carried that the President request Mr. Hal Hilmer to work more closely with the National High School Athletic Coaches Association.

XXXVI. McNEIL/MEDIPEL CORPORATION SPONSORSHIP:

The Board listened to a presentation from a representative of the McNeil Company relative to NATA sponsorship of Medipren. After extensive discussion concerning the possibility of NATA sponsorship and requirements concerning sponsorship on the part of the NATA, it was moved by District 7, seconded by District 8 and carried that Mr. Davis and Mr. Zeitlin be directed to negotiate a proposed agreement with Medipren and report to the Board in June and that there be communication with the Board members as appropriate in the midst of these negotiations.

XXXVII. PUBLIC RELATIONS:

The Board listened to a report from Mr. LeGear on the progress made in relation to public relations since his last report before the Board, with the Board
acted as follows:
Moved by District 2, seconded by District 1 and carried that the Board approve the Public Relations program as presented for the calendar year 1989 at a budget figure of $162,000.

Moved by District 2, seconded by District 1 and carried that Mr. Barton make a written report for publication in the NATA Journal concerning an evaluation of the public relations program.

Moved by District 8, seconded by District 10 and carried that Mr. Zaitlin and Mr. McIntyre investigate the effect that a job bulletin would have on the NATA’s tax exempt status.

Moved by District 2, seconded by District 9 and carried that a Newsletter be published in the months of September and March.

Moved by District 4, seconded by Mr. Barton and Mr. LeGear concerning the content of any Newsletter published.

XXXVIII. BUDGET:
The Board, in reviewing the proposed 1989 budget, acted as follows:
Moved by District 4, seconded by District 5 and carried that the Chairman of the Student Trainers Committee look at both his short and long term goals and redo them with the college student trainer as his primary focus.

Moved by Mr. Barton, seconded and carried that the Executive Director be asked to discuss the above motion with the Chairman of this Committee and determine an appropriate focus.

Moved by Mr. Barton, seconded and carried that the Executive Director discuss with the Chairman of the Student Trainers Committee the direction concerning the focus of this committee and to develop a mutually agreeable budget for the year 1989.

Moved by District 6, seconded by District 9 and carried that the Board accept the proposed budget for the 1989 year with the stipulation that the Executive Director be given executive power to oversee the budget and make adjustments as necessary.

XXXIX. STUDENT TRAINDERS BANQUET:
Moved by District 6, seconded by District 9 and carried that the Grants and Scholarships Committee be charged with the production of the Student Trainers Banquet at the Annual Clinical Symposium.

XL. INTERNATIONAL ASSOCIATION OF SPORTS VISION:
Moved by District 9, seconded by District 2 and carried that Mr. Mickey Cobb be liaison to the International Association of Sports Vision.

XLI. SMOKELESS TOBACCO RESEARCH:
Moved by District 9, seconded by District 10 and carried, with District 2 voting in the negative, that the NATA donate $2,500 to the University of Alabama as a cooperator concerning a survey and research concerning smokeless tobacco.

XLII. LONG RANGE PLANNING COMMITTEE:
Moved by District 10, seconded by District 1 and carried, with Mr. Godek abstaining from voting, that a Long Range Planning Committee be established with Mr. Godek as Chairman.

Moved by District 4, seconded by District 1 and carried that each District Director provide Mr. Godek with a list of possible committee members from his district and that he report to the Board of Directors in June with ideas for discussion.

Moved by District 6, seconded by District 8 and carried that this committee be made up of a geographic cross-section of the membership and that these selections be made by mail vote prior to the June Board meeting.

XLIII. DISTRICT REPORTS AND REQUESTS:
The Board, after being presented with various reports and requests from various District Directors, acted as follows:
In relation to a request from Michael Sandage relative to a procedure to connect employers with candidates, it was moved by District 10, seconded by District 6 and carried that this request be referred to the Chairman of the Placement Committee with a report to be made at the June Board meeting concerning this request.

The Board accepted for subsequent consideration three suggestions from Mr. May relative to who should be the NATA’s public spokesperson, the addressing of the general topic of product endorsements and a possible arrangement with Campbell Soups wherein labels can be traded for sports equipment.

Moved by District 2, seconded by District 1 and carried with Districts 1, 2, 3, 4, 7, 9 and 10 voting in the affirmative and Districts 5 and 6 abstaining, that the Board reconsider the NATA policy on conflict of interest and approve its amendment to read “when approved by a vote of the Board, all officers, directors, board liaison and designated board representatives shall conduct board matters in confidence.”

It was further moved by District 2 and was declared to be dead because of lack of a second that the Board discuss the possibility of splitting District 2 and 4 into two districts each thus helping to alleviate concerns regarding unequal representation on the Board of Directors for those districts with large memberships.

XLIV. PROFESSIONAL EDUCATION:
Dr. Behnke indicated that this committee had been meeting during the past two days, that he would subsequently write up and submit to the Board a report on its activities but at this time there was nothing for Board action to present.

Moved by District 2, seconded by District 10 and carried, with Districts 6 and 8 voting in opposition, that the Professional Education Committee develop guidelines for implementation of faculty athletic trainer programs.

XLV. RELOCATION OF NATIONAL HEADQUARTERS:
Moved by District 6, seconded by Mr. Barton (representing District 9) and carried, with Districts 1 and 2 being absent, that options be pursued concerning sites in the Dallas-Fort Worth area and Indianapolis, Indiana, as possible future sites for the National Office, that there be a conference call made after inspection of these properties to the Board and, further, that the Board of Directors be advised periodically by telephone regarding progress being made concerning location for a new National Office.

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NATIONAL ATHLETIC TRAINERS ASSOCIATION
39TH ANNUAL CONVENTION
June 10-15, 1988
Baltimore, Maryland

SCHEDULED ENTERTAINMENT - "BALTIMORE'S BEST"

FRIDAY, JUNE 10:
8:30 AM Second Annual ATC Golf Tournament. Open to ATC’s and approved guests only. Pre-registration required. See enclosed flier for complete details.

SATURDAY, JUNE 11:
8:00 AM Washington, D.C. Tour. This bus tour of our nation’s capitol will take you to all the popular tourist attractions. Tour departs from the convention center. See enclosed flier for complete details.
9:00 PM "Welcome to Baltimore": Opening Reception. Come renew old acquaintances and make new friends. Entry by invitation only. Sponsored by Exceed Sports Nutritionals of Ross Labs. Location TBA.

SUNDAY, JUNE 12:
7:30 AM 5 KM (3.1 miles) CRYOPAC® Fun Run sponsored by Cryomed Corporation. Open to trainers, spouses, and children. Details in registration kit.
8:00 AM Annapolis Cruise. Enjoy a cruise down the Chesapeake Bay to historic Annapolis aboard the Lady Baltimore. See enclosed flier for complete details.
9:00 AM Spouses Program at the Lord Baltimore in the Imperial Ballroom. Reception with coffee and pastries served prior to the forum, "Living With a Trainer."
5:00 PM Student Trainer Banquet at the Lord Baltimore in the Calvert Room. Tickets available at the Entertainment Desk.
8:00 PM "An Evening With the Denver Broncos” sponsored by the Denver Broncos. Certified members by invitation only. Location TBA.

MONDAY, JUNE 13:
9:00 AM Spouses Program at the Lord Baltimore in the Imperial Ballroom. Topic: "Personalities, Yours and Theirs, Bring Out the Best," Plus Come and work out with an Irish Olympian. (Dress appropriately).
11:00 AM "Harbor Sail". This luncheon tour of Baltimore’s harbor and points of interest aboard the Clipper City is a refreshing change from the activities ashore. See enclosed flier for complete details.
Alumni Get Togethers.
5:00 PM "NATA NIGHT" Hosted by The Original Sports Bar. Convention badge and proof of age required. See enclosed flier for complete details.

TUESDAY, JUNE 14:
7:30 AM Fellowship of Christian Athletes Breakfast at the Lord Baltimore in Calvert C. Tickets available at the Entertainment Desk.
9:00 AM Spouses Program at the Convention Center in Room 317. Topics: "Tobacco Free America"; "Psychological Problems of the Athletic Trainer"; "Psychological Problems of the Athletic Trainer’s Spouse."
6:30 PM Cocktail reception prior to NATA Awards Banquet located in the Pratt Street Lobby of the Convention Center. Cash bar provided.
7:00 PM NATA Awards Banquet at the Convention Center in Hall A.

WEDNESDAY, JUNE 15:
8:00 AM Washington, D.C. Tour for those who missed the Saturday tour, the same is offered again!

WEDNESDAY - SATURDAY, JUNE 15-18
Post Convention Trip packages to Washington, Williamsburg, Atlantic City, and Ocean City. See flier for complete details. Pre-registration required.
SUNDAY, June 12, 1988
9:00 AM - 12:00 Noon - 4 Concurrent Sessions
  Session I - 5th AOSSM Symposium, "BACK INJURIES IN ATHLETICS"
  Session II - PFATS Seminar, "REHABILITATION OF ATHLETIC INJURIES", Part I
  Session III - "MODALITIES SEMINAR"
  Session IV - "EYE INJURIES AND CARE IN ATHLETICS"
2:00 PM - 5:00 PM
  Schering Symposium - "COMMUNICABLE DISEASES IN ATHLETICS"
7:00 PM - 9:30 PM - 3 Concurrent Sessions
  Session I - PBATS Seminar, "CARE OF ELBOW INJURIES"
  Session II - PFATS Seminar, "REHABILITATION OF ATHLETIC INJURIES, Part II"
  Session III - Women's ATC Conference
MONDAY, June 13, 1988
8:30 AM - 11:00 AM
  Session I - Opening Remarks, Guest Lecturer - "THE ATHLETIC "TRAINER". Keynote Address - Fred Hoover, Clemson University
  Session II - Poster Presentations
11:00 AM - 1:00 PM
  National Business Meeting
2:00 PM - 4:30 PM - 3 Concurrent Sessions
  Session I - Overview of Sports Psychology in Athletic Training
  Session II - Emergency Medicine/Field Procedures
  Session III - Student Athletic Trainers Seminar/Use of Emergency Equipment, "Stinger Injuries"; Professionalism Preparation. Common OTC Drugs in Athletics, Modalities
4:30 - 6:00 PM
  District Meetings
TUESDAY, June 14, 1988
8:00 AM - 12:00 Noon - 4 Concurrent Sessions
  Session I - Lateral Knee Bracing - An Update
  Session II - Current Diagnostic Techniques in Radiology Associated with Orthopedic Sports Medicine
  Session III - Psychology of Rehabilitation of the Injured Athlete
  Session IV - High School Athletic Trainers Seminar
1:00 PM - 5:00 PM - 4 Concurrent Sessions
  Session I - Role of the Female AT., C.
  Session II - Clinical/Industrial Athletic Trainer: The Changing Role of the AT., C.
  Session III - Seminar: Computers and the Athletic Trainer
  Session IV - Free Communications
Evening:
  Awards Banquet
WEDNESDAY, June 15, 1988
8:00 AM - 11:30 AM - 2 Concurrent Sessions
  Session I - Care & Treatment of the Foot & Ankle
  Session II - Relationships Between the AT., C. and the Strength Coach
Ft. Worth - 1989

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Journal Deadlines/Designees

The Editorial Board will review papers submitted on an individual basis, work with the authors and prepare the papers for publication.

As stated in number 5 of the Guide to Contributors, this review process takes from 6 to 12 weeks. Send manuscripts, Case Reports, and Tips from the Field to:

Ken Knight, Editor
Physical Education Department
Indiana State University
Terre Haute, IN 47809

In order to avoid confusion and delays on other contributions to the Journal, the deadlines are provided below.

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Send material for Announcements, Letters to the Editor and Committee Forum to:

Steve Yates, Editor-in-Chief
P.O. Box 7265 - Sports Medicine Unit
Wake Forest University
Winston-Salem, NC 27109

Information on upcoming events for the Calendar of Events section should be sent to:

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Athletic Department
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