ATHLETIC TRAINING

THE JO[illegible]TION

VOLUME 17
NUMBER 4
WINTER 1982

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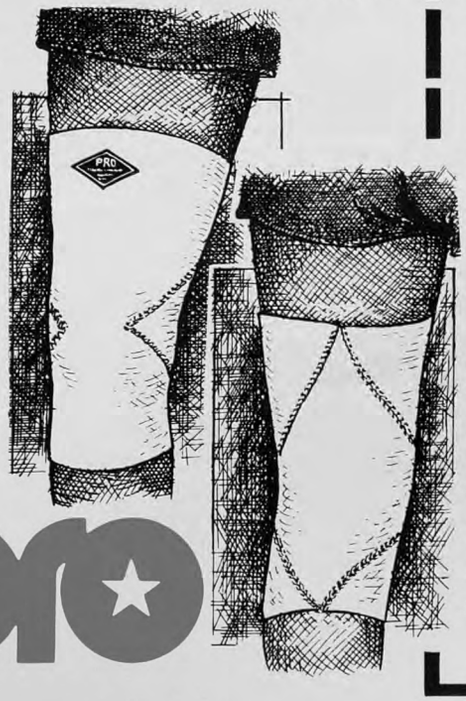

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THE JOURNAL OF
THE NATIONAL ATHLETIC TRAINERS ASSOCIATION

Volume 17, Number 4, Winter 1982

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Features

Tips from the Field

Departments

The National Athletic Trainers Association

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Eastern Kentucky University
Athletic Department
Richmond, Kentucky 40475

Executive Director
Otho Davis
Philadelphia Eagles
Veterans Stadium
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President's Message

Dear NATA Member:

Since the publication of the Fall 1982 Journal, our Association has been granted conditional Category A membership with the National Commission of Health Certifying Agencies. This is a significant milestone in the historical development of our Association. I would like to publicly thank Mr. Paul Grace and Dr. Gerald Bell for the dedicated efforts in making this goal a reality. Following a year in the conditional Category A classification the NATA will be eligible to receive Regular Category A Membership. The Executive Committee of NCHCA was very impressed with the presentation made before their membership committee.

Numerous questions have crossed my desk regarding the NCHCA guidelines as related to educational requirements for becoming a Certified Athletic Trainer. The NCHCA has not altered the NATA educational requirements in any way. If you have questions in this regard please contact your District Director or Mr. Grace for further clarification.

Your national officers are presently considering several suggestions to improve the efficiency and visability of our Association. Many outstanding ideas have come from you, our members. Our financial advisor has strongly suggested a raise in membership dues prior to the consideration of new undertaking. An increase is needed in order to maintain our present methods of operation. Obviously additional services will necessitate a corresponding increase in dues. Please inform your District Director of any suggestions or comments that you may have. Many of our goals for 1983 are simply unrealistic without a change in our dues structure.

I hope the remaining winter months make us all aware of our good fortunes in being a contributing member of a "helping" profession. Our continued growth in professional development gives me a great deal of hope for the upcoming year. Please remember that your Board of Directors and officers are chosen to serve our members. Continue to keep these lines of communication open, for this is extremely necessary for the continuing advancement of our profession.

Warmest personal regards,

Bobby

Bobby Barton, ATC
President

Editor's Remarks

Ken Wolfert, ATC

New Section . . .

Beginning with this issue we have added a section where specific and general information from the National Office can be kept all together for your reading convenience. Instead of looking all over for something you want to recall, it now can be located easily in the table of contents. It also might not be quite as necessary to contact the National Office for answers to questions on: address change, district transfer, certification deadlines and information, continuing education information, placement information and other timely information that would aid the membership.

Greetings . . .

On behalf of the Journal Committee I want to thank those many members who have contributed their efforts putting together our Journal. We hope that the new year will provide much success, happiness and fulfillment.

Do it and keep it safe . . . (KW) +

Letters to the Editor

To The Editor:

As the recipient of the 1982 Chuck Cramer Scholarship I would like to thank Cramer Products for making this scholarship available to undergraduate students interested in the field of Athletic Training. I would also like to thank the NATA and the scholarship committee for bestowing this award on me. I believe that the National Scholarships and the District Scholarship's that are now being given are giving the Athletic Training students a greater incentive to achieve academic excellence and to seek out new information. Finally, I would like to give a big thanks to the University of Southern Mississippi Student Sports Medicine Association. Without their support and financial help I would not have been able to attend the National Convention in Seattle, Washington and I feel very fortunate to work with students of this caliber.

Gary L. Harrelson
University of Southern Mississippi

To the Editor:

Mr. Hossler and Mr. Lipp are to be commended for their fine contribution, "Podiatry and the Athletic Trainer" in volume 17, #2 as there was much useful information for us all. However, there are several points which merit comment.

In the non-weight bearing examination, section 4, figure 4 (labeled as figure 5 in the text) does indeed reflect an absence of the "perpendicularity between the line bissecting the calcaneus and the plane of the forefoot". However, due to the tri-planar axial configuration of the subtalar joint this parameter will not be accurately assessed unless the subtalar joint is first placed in its neutral position. Otherwise there will always be a calcaneal varus of some degree in the resting NWB position.

While the use of a "unilaterally beveled heel cushion with the thicker portion of the cushion placed on the side that drops closest to the surface of the ground" is generally an adequate guideline this may actually exacerbate the problem if a compensated forefoot varus exists.

Wear patterns of shoes are often useful indicators of lower extremity pathology but must be correlated with objective data. A varus type wear pattern may exist while weight-bearing exam reveals a pronated foot. NWB exam may indicate a forefoot varus deformity that is actually being compensated for in the rearfoot.

Finally, the idea that the vastus medialis muscle can be selectively strengthened with terminal knee extensions is not accurate. (Lieb and Perry, Quadriceps Function: An Electromyographic Study Under Isometric Conditions, Journal of Bone and Joint Surgery, 749-758, 1971) This muscle is active throughout the entire extension phase. While TKE may be an essential part of the rehab protocol they do not isolate on any given muscle.

These comments are not forwarded as critisism but rather for clarification of several points made in this article, which I found quite informative.

David Knoeppel
Indianapolis, Indiana

Correction:
The captions were inadvertently reversed by the printer on page 192 of the fall Journal. The captions below are correct as submitted by Dr. Jay Cox in "The Diagnosis and Management of Ankle Ligament Injuries in the Athlete."

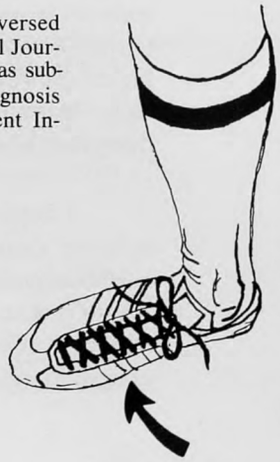

Figure 1. Eversion Injury

Figure 2. Inversion Injury

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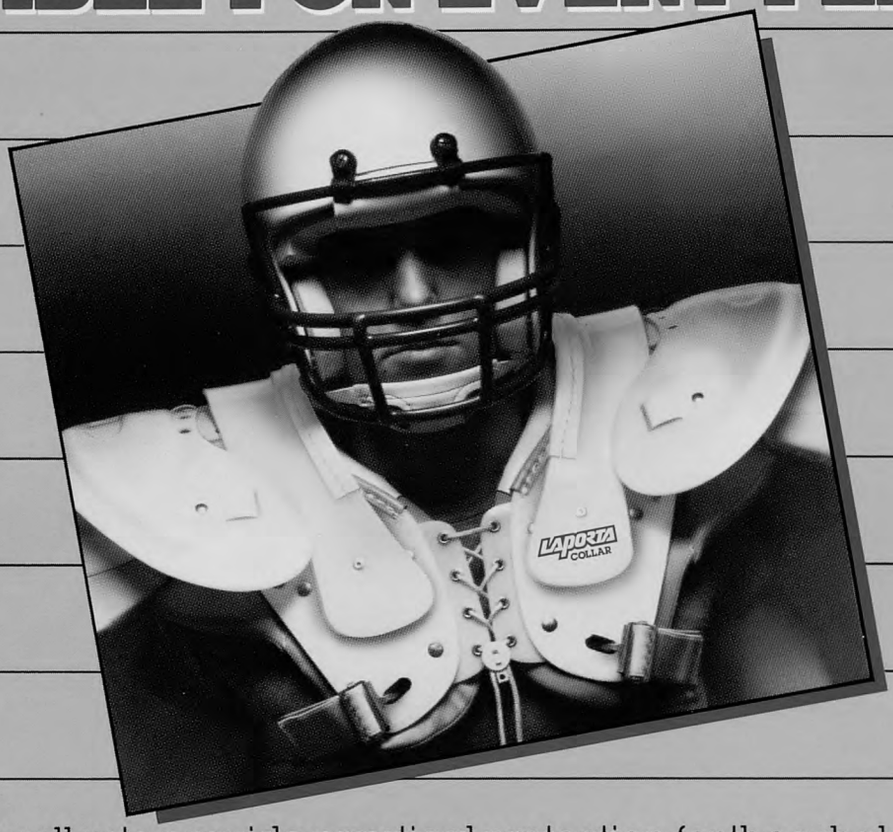

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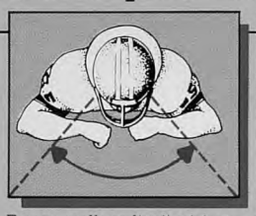

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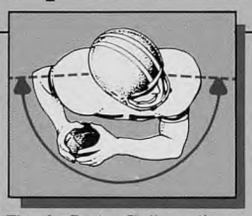

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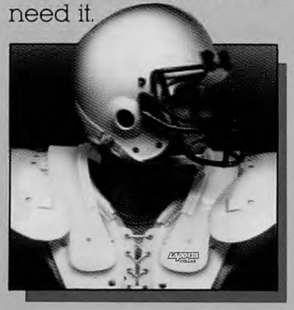

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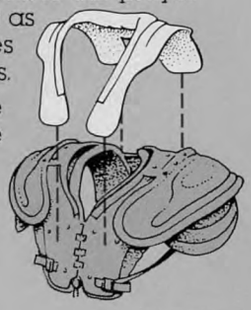

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Potpourri

Dennis Aten, ATC, RPT, MS
Eastern Illinois University

Neiss Reports

National Electronic Injury Surveillance System reports that football far outdistances other sports in reported injuries during the October through December, 1981, time period. However, for the year bicycle related injuries reporting to emergency rooms connected with NEISS outnumbered football injuries. This may be partially due to the growing trend for football athletic injuries to be handled by athletic trainers and their team physician without the necessity of ER referral.

Baseball has an estimated number of injuries that surpasses football and basketball follows close behind. Skating and playground accidents are a distant fifth and sixth.

Sports Medicine Focus

AAOS Bulletin, December, 1981

The American Academy of Orthopaedic Surgeons' 1982 Continuing Education schedule reflects the growing importance of sports medicine.

Courses that focus on arthroscopy, sports medicine and pediatric orthopaedics top the 1982 schedule of Academy-sponsored learning programs. These popular topics in orthopaedics highlight an ambitious course offering that also includes such subjects as total joint replacement, treatment of foot problems, fracture management and treatment of spinal deformities. Emphasis varies from advanced techniques to basic review and surgical management.

The selection includes 26 courses for physicians; four courses for othopaedic nurses and allied health professionals; one for physical therapists only; and one for both physical and occupational therapists.

Two courses for orthopaedic educators are also planned.

Athletic Participation Preparation Studied

P.T. Progress Report, March, 1982

Last summer, the University of North Carolina at Chapel Hill's Family Medicine and Physical Therapy Departments administered a program designed to improve player conditioning and prevent injuries to the local Chapel Hill High School football team. The program was initiated two summers ago by the department of family medicine and was expanded to include the division of physical therapy.

The significance of the study, according to Dr. Edward Shahady, chairman of the Division of Family Medicine, lies in its determining what kinds of evaluations are helpful in predicting and preventing injuries in the young athlete.

"The purpose of these tests," according to Le Veau, Associate Professor Physical Therapy, "is to identify areas of risk, problems that are most likely to develop in each player."

He stressed the importance of building up endurance among the young athletes. "Most game injuries," LeVeau said, "occur in the second and fourth quarters because some players play both offense and defense, and that's when they are starting to get tired."

As a result of the testing, individual training programs were tailored to meet each player's needs.

Peterson Honored

AAOS Bulletin, December, 1981

Thomas R. Peterson, MD, received the first O'Donoghue Sports Injury Research Award from the American Orthopaedic Society for Sports Medicine. Dr. Peterson was cited for his research on the prevention of sports injuries.

Pediatric Bibliography Published

AAOS Bulletin, April, 1982

The Academy's Committee on Pediatric Orthopaedics has just published a bibliography of references pertaining to pediatric orthopaedic conditions and treatment. Entitled A Selected Bibliography of Pediatric Orthopaedics, the 127-page book includes references in the following 23 topic areas:

— History of Orthopaedics
— Growth and Development
— Vertebral Column
— Congenital Anomalies of the Cervical Spine
— The Hip
— The Knee
— Foot and Ankle
— Upper Extremity
— Cerebral Palsy
— Neuromuscular Diseases
— Inflammatory Conditions
— Skeletal Infections
— Metabolic Abnormalities
— Genetics and Orthopaedics
— Genetic and Defective Formation of Bone
— Hemophilia and Related Circulatory Disorders
— Tumors
— Leg-Length Discrepancy
— Myelodysplasia
— Congenital Limb Deficiency and the Child Amputee
— Limb Orthotics
— Trauma
— Rehabilitation

The publication may be ordered from the Academy office through the Department of Publications. Request AAOS Publication #660-81; the price is $10 each, prepaid and postpaid.

Need for Record Keeping Stressed

USSA News, Winter, 1982

James Manning wrote an article in USSA News reminding us of the importance of record keeping. He emphasized that the need for athletic trainers to compile complete records seems never to be fully realized until either repeated injuries occur to an athlete, or a civil suit, a criminal action following reconditioning, or an insurance action occurs.

Complete records should include: physician's referral and treatment regimen, family medical history, pre-season physical examination, daily injury report and progress reports.

Objections usually raised by trainers include lack of time or just plain unwillingness. Frankly, one of the most important tools of an athletic trainer is a well kept injury record.

Continued on page 244

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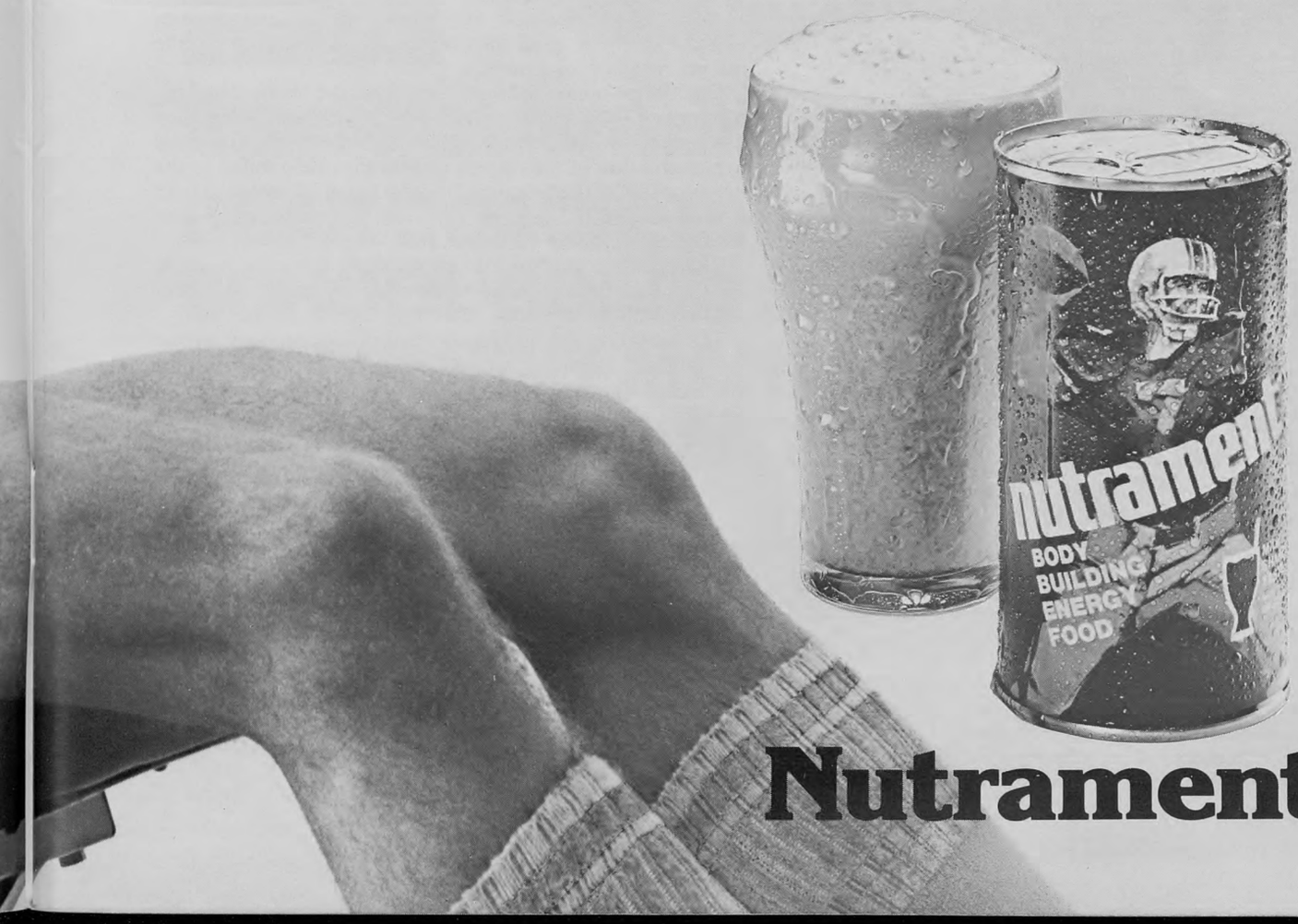

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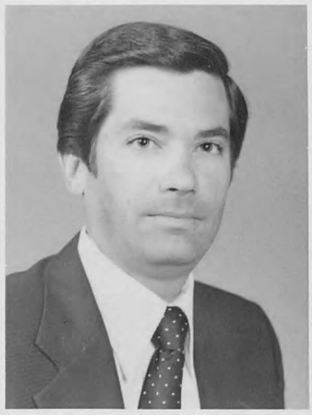
Calendar of Events



Jeff Fair, ATC, MS
Oklahoma State University

Athletic Training will be happy to list events of interest to persons involved in sports medicine, providing we receive the information at least two months in advance of publication. Please include all pertinent information and the name and address of the person to contact for further information. This information should be sent to; Jeff Fair, Head Athletic Trainer, Athletic Department, Oklahoma State University, Stillwater, OK 74078. +

February 1983

10-12 The United State Baseball Federation and the United State Olympic Committee Sports Medicine Council, Upper Extremities in Throwing Sports'', Atlanta, Georgia. Contact the U.S. Olympic Committee, Sports Medicine Division, 1750 East Boulder St., Colorado Springs, CO 80909.

13-18 3rd Annual Cleveland Clinic/University of Vermont Sports Medicine Symposium for Family Practitioners, Orthopaedic Surgeons, and other Allied Health Personnel, Sugarbush, Vermont. Contact John Bergfeld, Cleveland Clinic, 9500 Euclid Ave., Cleveland, OH 44106.

20 Alamo Area Athletic Trainers Association's Fourth Annual Sports Injury Clinic. Contact George Young, John Marshall High School, 8000 Lobo Lane, San Antonio, TX 78240.

23-March 1 Adolescent/Young Adult Medicine CME Program, Maui, Hawaii. Contact Hurley Medical Center, Department of Continuing Medical Education, One Hurley Plaza, Flint, MI 48504.

March 1983

4-6 NATA Professional Education Conference, Newport Beach, California. Contact Gary Delforge, Department of Physical Education, University of Arizona, Tucson, AZ 85721.

5 14th Annual Medical Aspects of Sports Seminar, Newark Delaware. Contact C. Roy Rylander, Athletic Department, University of Delaware, Newark, DE 19711.

18-20 NATA District Five Annual Meeting, Lincoln, Nebraska. Contact Jerry Weber, Athletic Department, University of Nebraska, Lincoln, NE 68588.

25-26 16th Annual Sports Medicine and Conditioning Seminar, Red Lion Inn/Sea Tac, Seattle, Washington. Contact Ken Foreman, PhD Director of Education and Research, The Sports Medicine Clinic, 1551 Northwest 54th, Suite 200, Seattle, WA 98107.

25-27 Stress Factors in Emergency Medical Services and Critical Care Medicine, Catonsville, Maryland. Contact Jeffrey Mitchell, Emergency Health Services Program, University of Maryland, Baltimore County, Catonsville, MD 21228.

Potpourri cont. from page 241

"Cool Band"

From UPI News Release

It is obvious we are still looking for the pot at the end of the rainbow to answer our problems. Consider the following:

Taking a tip from towels dunked in ice water, two young entrepreneurs have come up with a frozen sweatband to cool the wrists, ankles and foreheads or perspiring athletes.

"It can help you stay cool and feel less tired," said Richard Blossman, inventor of the Cool Band.

"The concept is based on studies that show cold applied to local areas of the body can slow the metabolism, lowering the need for oxygen."

Double Jointed: No Extra Risks

Aches and Pains, Jan., 1982

About 5% of all people are "double jointed." This benign hypermobile joint syndrome represents one extreme of the normal range of joint motion.

Drs. Forest Jessee and his associates at the Medical College of Virginia, Richmond, consider subjects hypermobile if they can perform two of the three following maneuvers: 1) passive hyperextension of the fingers so that they lie parallel to the extensor side of the forearm; 2) active hyperextension of both elbows beyond 180 degrees; or 3) passive opposition of both thumbs to the inside surfaces of the wrists.

Women are more often "double jointed" than men, probably due to men's heavier musculature which produces greater joint restriction.

The doctors could find no correlation between joint hypermobility and other musculoskeletal disorders such as arthritis, Ehlers-Danlos syndrome (thin skin, easy bruising or bleeding, poor wound healing, hernias, ocular lens dislocation) and mitral valve prolapse.

Preparticipation Evaluation

Progress Report, July/August 1982

Guidelines for Pre-Season Athletic Participation Evaluation, a 1979 publication of APTA's Section of Sports Physical Therapy, is being revised by Section members. Contributions are invited on pre-season screening protocols such as tests for posture, joint range, flexibility, strength, balance, and medical problems. Abstracts and reference works are also acceptable. Send contributions and inquiries to Barbara Sanders, MS, PT, University of Wisconsin-La Crosse, 2031 Cowley Hall, La Crosse, Wisconsin 54601. +

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NO HELMET CAN PREVENT ALL HEAD OR NECK INJURIES A PLAYER MIGHT RECEIVE WHILE PARTICIPATING IN FOOTBALL.

Do not use this Helmet to butt, ram or spear an opposing player. This is in violation of the football rules and such use can result in severe head or neck injuries, paralysis or death to you and possible injury to your opponent.

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A warning label has been placed with each helmet to remind the user of the risks and to warn him against dangerous conduct.

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Association Activities

David G. Yeo, DPE, ATC
Montgomery County Community College

The "Who Can Top This?" challenge, first appearing in the Summer '82 issue, began with the report that the University of Northern Colorado had three trainers in the NFL. In the Fall '82 issue it was noted that San Diego State University had seven graduates working as trainers for professional teams. Mankato State University now reports that it has had six of its graduates employed in the NFL (three at Present: Jim Popp, Green Bay; Joel Krekelberg, Houston; and Larry Newman, Minnesota), and that five graduates are currently with professional baseball teams. While the intent of the "Who Can Top This?" piece was to spark interest in our professional preparation programs, it will serve no purpose to continue such discussion in the Journal. Thank you for your input. All of our 62 NATA approved Athletic Training Education Programs can point to several outstanding graduates in many different types of employment.

Ken Locker, ATC, of the Dallas Cowboys, is the new group coordinator for the Dallas Blood Center, a non-profit 10-year-old institution which provides blood to 11 medical facilities throughout the North Texas area. Ken contacts Dallas area businesses, churches, and other organizations to enlist their aid to ensure a continuing supply of healthy donors. A graduate of North Texas State University, Ken joined the Cowboy organization 10 years ago.

On an annual basis, the Journal hopes to list our international affiliate members and certified members living in other countries who are currently active within the profession. In this issue we are proud to identify our international affiliate members, and encourage your correspondance with them.

James H. Field
18 Gow Ave Albion Park Rail
NSW Australia

Terrance Fitzgerald, MD
Suite 2, 46 Railway Rd. Marayong
NSW 2148 Australia

Lee P. Jansen
CHR King & Union Sts. Newcastle
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Cont. on page 290

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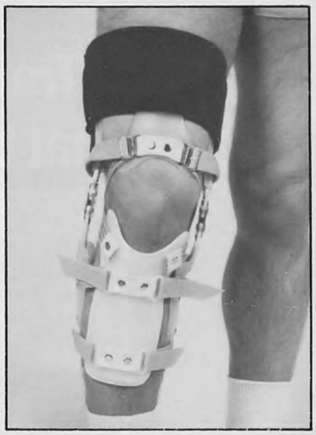

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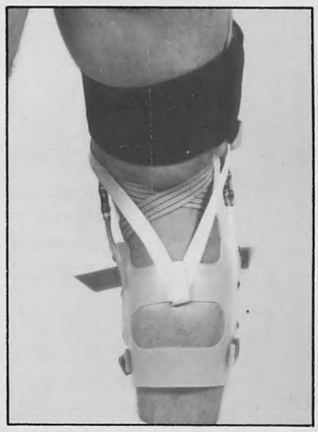

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Functional Treatment and Rehabilitation of Quadriceps Contusions, Patella Dislocations and "Isolated" Medial Collateral Ligament Injuries

William G. Clancy, Jr., MD
James J. Bosanny, ATC

Edited by: Don Kaverman, ATC

Rigid immobilization of an extremity particularly when compounded by surgical intervention can and does lead to significant osteoporosis about the ligamentous bony attachments, decreased tensile strength of the ligaments themselves, and marked muscle atrophy. The deleterious effect of immobilization creating ligamentous weakness, and osteoporosis of its attachment to bone has been documented by Noyes, et al.[1] That immobilization adversely affects the oxidative muscle fibers has been noted by Haggmark and Eriksson.[2] They have also demonstrated that cast bracing post surgery which allows for some motion may significantly decrease the anticipated muscle atrophy of rigid immobilization.

Peacock's research on wound healing revealed that with early controlled motion fibroblasts tend to orient themselves along the lines of stress and that collagen is then laid down along the lines of stress.[3] Salter has demonstrated that early passive motion can lead to a stronger repair sooner than if treated with rigid immobilization.[4]

Because of the aforementioned reasons, early functional treatment and rehabilitation, particularly in the treatment of quadriceps contusions, patellar dislocations, and isolated medial collateral ligament injuries has been utilized.

Quadriceps Contusions

A direct blow to any of the quadriceps muscles can produce a spectrum of injury. The muscle injury that occurs from the blow may be minimal or severe. With a minimal injury there is some death of muscle fibers, with resultant mild quadriceps spasm and minimal to mild loss of flexion. The more severe the blow the more muscle undergoes necrosis with the concomitant greater loss of flexion due to pain and muscle spasm. If the blow is quite severe, there is marked muscle necrosis, often evoking a sympathetic reaction of the knee joint synovium producing an asymptomatic knee effusion. When this does occur, there is a greater risk of myositis ossificans.

Dr. Clancy is head of the section of Sports Medicine Division of Orthopedic Surgery, University of Wisconsin-Madison, Madison, Wisconsin 53706. Mr. Bosanny is Trainer at University of Wisconsin.

It is important to know that once a muscle fiber dies, it does not regenerate. The area of muscle necrosis is filled in with fibroblasts which will form a mass of scar to unite the torn ends of the remaining muscle fibers. This mass of fibroblasts and the collagen produced by these cells is at first highly unorganized and may remain so, leading to a contracture in this area. Peacock, however, has shown that with controlled motion the fibroblasts will tend to orient themselves along lines of stress and will lay down collagen along these same lines of stress. The motion must be controlled otherwise there will be tearing of the fibrous tissue with an increased inflammatory reaction, resulting in increased scar formation.

Unfortunately, in those with a severe quadriceps contusion, some unknown mechanism can stimulate the formation of osteoblasts which will lay down bone instead of fibrous scar. This resultant bone formation is called myositis ossificans. The formation of myositis ossificans appears to be directly related to the severity of the blow. Myositis ossificans may also occur as the result of a second injury to a moderate quadriceps contusion which had not completely resolved prior to return to athletics.

To be consistent with Jackson and Feagin's previous publication on this entity, quadriceps contusions have been graded based on their range of motion at forty-eight hours after injury.[5] A grade I injury represents a mild contusion with greater than 90° of knee flexion; a grade II or moderate injury has between 45° and 90° of knee flexion; while a grade III or severe injury has less than 45° of knee flexion.

Grade II and III injuries can present difficulties during the rehabilitation program as they may become reactive even without trauma or a significant increase in their rehabilitation program. Therefore after initiating the rehabilitation program, the thigh should be examined daily prior to starting the rehabilitation program looking for signs that the muscle is reacting adversely. The signs to look for are:

1. increase in pain
2. loss of more range of motion
3. loss of the softness of the injured muscle
4. increase in size of the quadriceps

If any of the aforementioned signs appear, one must curtail or decrease the amount of rehabilitation for several days. If these symptoms persist, the athlete should see a physician.

Rehabilitation Program

0-72 hrs.:

1. ice, compression, and elevation
2. crutches with partial weight bearing
3. record ROM at 48 hrs. for grading of the injury

72 hrs. on:

1. cold whirlpool for gentle ROM
2. start isometric exercises for quadriceps, hamstring, hip abductor and hip adductor muscles.
3. continue crutches until one can walk without a limp.
4. start gentle passive motion on an exercise bike if there is only minimal pain at least 90° of knee flexion.
5. start a weight training progressive resistance program when there is no tender, firm thickening of the involved muscle.
6. start the running program when there is essentially no quadriceps pain and full range of motion.

Running Program

1. Jog 1 mile — stop if there is a limp or when one notices quadriceps pain.
2. If there is no pain or limp run:
   6 x 80 yds. ½ speed
   6 x 80 yds. ¾ speed
   6 x 80 yds. full speed
   6 x 80 yds. ½ speed cutting
   6 x 80 yds. full speed cutting

Stop whenever there is pain or limp. The next day repeat the entire running program until it can be completed in one day.

Ideally, the running program should be tried daily before performing the weight program. Each day ice should be applied at the conclusion of the program.

One should be attentive to any adverse signs suggesting there has been an overload of the injured area. The criteria for return to competition is a painless, full range of motion and 90% strength and endurance as compared to the opposite extremity.

If return is to a contact sport, the area should be well padded. One should note that active assisted and passive stretching was not a routine part of this protocol.

In Jackson's study of West Point cadets, the average return time to competitive sports for a grade I injury was 6.5 days, for a grade II injury 56 days, and for a grade III injury 72 days.

Patellar Dislocations

Patellar dislocations are not uncommon with sporting activities but can be difficult to diagnose if the athlete was not aware that the patella dislocated and reduced itself. Fortunately the first episode and recurrent episodes of significant force will usually produce a large, tense, bloody knee effusion within twenty-four hours after injury. In addition to a large effusion one will almost always find marked pain on palpation of the insertion of the vastus medialis to the intermuscular septum just superior to the adductor tubercle. Although the athlete does not usually complain of pain in this area, it will be quite painful to palpation. The reason for this pain is that a complete patellar dislocation cannot occur with only a tear of the anterior medial capsule. There must also occur either a tear of the vastus medialis tendon from the patella, or a tear of the vastus medialis from its insertion to the intermuscular septum.

Usually a patellar dislocation occurs with a valgus force, and when the patella dislocates the knee loses the stabilizing effect of the quadriceps. Therefore much of the valgus force must be sustained by the medial collateral ligament which is thus secondarily injured. Fortunately, complete disruption is not frequently associated with a patellar dislocation, however, first and second degree injuries are. Thus with all medial collateral ligament injuries there remains the possibility of associated patellar dislocations.

In the past, standard treatment of a first episode patellar dislocation consisted of six weeks of immobilization in a cylinder cast. A preferred method of treatment consists of early functional rehabilitation.

1. A two week period of immobilization in a knee immobilizer with partial weight bearing on crutches.
2. Initiation of quadriceps, hamstring and hip abductor isometrics as tolerated, preferably at 48 hrs.
3. At two weeks start passive motion utilizing an exercise bike. Begin a swimming program consisting of 30 to 45 minutes of free style swimming. Start straight leg raises with weights at two weeks.
4. At three weeks:
   a) continue swimming program
   b) continue passive motion on an exercise bike
   c) start progressive resistance weight program
5. At four weeks:
   a) begin the running program
6. Allow resumption of competitive sports when there is full range of painless motion and there is 90% strength and endurance as compared to the opposite knee.

Functional Treatment and Rehabilitation of "Isolated" Medial Collateral Ligament Injuries

The most frequent significant knee injury that occurs in contact sports is an isolated medial collateral ligament injury. It is termed isolated because there is rarely any associated meniscal or articular injury. When a true interbody meniscal tear is found with a medial collateral ligament injury, the injury is usually associated with an accompanying partial or complete tear of the anterior cruciate ligament or less frequently a posterior cruciate ligament injury.

To be classified as an "isolated" medial collateral ligament injury both cruciate ligaments must be intact, and clinically the Lachman's test must be negative. The Lachman's test is an anterior drawer evaluation performed at 20° of knee flexion. In the relaxed patient it is considered to be ninety-nine percent accurate. Unfortunately with minimal hamstring spasm the Lachman's test can be negated, and this fact must be kept in mind when evaluating a knee injury. Additionally one must remember that joint line pain and the various tests for meniscal injury such as the McMurray's test or Apley's test will usually be positive with an acute partial or complete

"isolated" medial collateral ligament injury because these tests all involve maneuvers that stretch the collateral ligament.

Isolated medial collateral ligament injuries are classified as first, second and third degree sprains based on the amount of the ligament injury sustained.

A first degree injury implies that only a few fibers have been torn and that there is no laxity present to valgus testing at 30° and 0° of knee flexion. With 30° of knee flexion most of the medial and lateral ligamentous structures are relaxed thus allowing for more isolated testing of the medial collateral ligament.

With the knee in full extention the medial collateral ligament is under some physiologic stretch, as are all of the other stabilizing structures. When there has been an injury to the MCL, a pseudo locked knee may develop. The knee is not truly locked but because there is significant pain with further extension due to stretching of the partial ligament tear, the hamstring muscles go into spasm preventing any further extension.

Examination at twenty-four and forty-eight hours should reveal a very mild effusion and if aspirated should be serosanguineous. Pain to palpation can be located at any point along the length of the tibial collateral ligament. This can include pain at the joint line. There should be no other significant pain. One must remember that the tibial collateral ligament extends distally for approximately three inches below the joint line.

Active range of motion may be completely normal or limited due to pain from stretch of the ligament. The Lachman's test is normal as is the pivot shift test.

A second degree sprain means that a significant number of fibers of the ligament are torn. Some fibers are definitely intact, although these may have sustained interstitial failure with stretching.

Immediate examination after injury will reveal slight to moderate increase in laxity with valgus stress at 30° of knee flexion, but there is a firm end point. At full extension no laxity should be present with valgus stress. The Lachman's test is negative as is the pivot shift.

If seen twenty-four to forty-eight hours later, there will be a serosanguineous effusion present. There will be marked pain to palpation of the tibial collateral ligament making adequate valgus and varus stress testing quite difficult. If valgus testing is difficult one may locally infiltrate the area of pain and also inject the knee joint with Lidocaine, and then examine the knee fifteen minutes later.

A third degree sprain means that there has been complete rupture of all the fibers of the tibial collateral ligament. This injury would also include a complete tear of the meniscofemoral or meniscotibial portion of the capsule (the so-called mid medial capsule). This capsular tear, however, does not involve the meniscus itself.

Immediate examiniation reveals that there is significant laxity of the medial ligament with valgus stress with to the knee flexed to 30°, but there is minimal laxity to valgus stress with the knee in full extension. The Lachman's test may appear to be somewhat increased but there is a firm, hard end point. In reality it is not a true anterior translation of the tibia, but an anterior and external rotation of the anterior medial tibial plateau. This could be termed a "Pseudo Lachman's Test". One must be sure that the lateral tibial plateau is not also translating anterior for this would be a true Lachman's test indicating a tear of the anterior cruciate ligament. The pivot shift test should likewise be negative. If there is a complete tear of the medial collateral ligament, posterior medial capsule and the anterior cruciate ligament, there will be no pivot shift test because there is no medial buttress to produce the valgus force necessary to create the pivot shift phenomenon.

At twenty-four to forty-eight hours after injury there is usually only a very mild sanguineous effusion. The hemarthrosis that should be expected leaks out of the knee joint through the mid medial or posterior medial capsular tear.

Again the clinical examination may be limited due to pain and muscle spasm. Local infiltration and infiltration of the knee joint may lessen the pain and spasm enough to allow for varus and valgus testing.

There may be a "Pseudo Lachman's Test" present due to external rotation of the anterior medial tibial plateau. If one holds the tibia in neutral position, the pseudo Lachman's test should disappear. One should not hold the tibia in marked internal rotation when performing this Lachman's test because this will result in a tightening up the iliotibial tract which will prevent electing a positive Lachman's even if the anterior cruciate ligament is torn.

Functional treatment and rehabilitation of first, second and third degree "isolated" medial collateral ligament sprains is essentially the same. Progression from one phase to the next is based on attaining the functional goals of each step.

I. Immobilization Period
0-72 hrs.

1. ice/compression and elevation
2. knee immobilizer with partial weight bearing on crutches
3. begin isometric straight leg raises as soon as tolerated

II. Mobilization Period
72 hours. on

1. Continue with crutches and progress to full weight bearing as tolerated until one can walk without a limp.
2. Discard the knee immobilizer during the day, stimulating the quadriceps and hamstrings to protect the knee, but wear the immobilizer at night when sleeping as the muscles are relaxed.
3. Begin range of motion in a cold whirlpool.
4. Continue quad sets and isometric straight leg lifts with weights for quadriceps, hamstring and hip abductors (avoid hip **add**uctors for it loads the medial collateral ligament).

III. Mobilization Period
90° of flexion

1. When there is 90° of painless knee flexion a progressive resistance weight program is begun even if there is still some loss of extension. One can use an N-K table, universal or nautilus device for this, or preferably an orthotron or cybex unit. One should measure the single maximum lift of the uninjured leg. The recommended program is three sets of ten repetitions for knee extension and knee flexion with the maximum amount of weight tolerated. Every five to seven days the weight should be increased if possible.
2. Start passive motion exercises utilizing an exercise bike. The uninjured leg does all the work while the injured leg goes along for the ride. Recommended length of exercise is fifteen to thirty minutes.

IV. Mobilization Period
Full range of motion

1. The weight program is continued

2. One now starts the running program as previously outlined

   Jog one mile, but stop when there is pain or a limp. If no pain or limp, progress through the following until there is pain or a limp.
   6 x 80 yds. at ½ speed
   6 x 80 yds. at ¾ speed
   6 x 80 yds. at full speed
   6 x 80 yds. at ½ speed cutting
   6 x 80 yds. at full speed cutting

Each day the entire program is attempted until it can be completed.

V. Return to Competition

1. When there is full range of painless motion, there is 90% strength, endurance and power as compared to the uninjured leg, and the running program has been completed.

2. Clinical examination should reveal no effusion, and only slight laxity at 30^0 of flexion to valgus stress without pain in those with second or third degree sprains.

Discussion

From 1975 to the present 105 University of Wisconsin varsity football players were treated for first, second, and third degree "isolated" medial collateral ligament injuries. There were 66 first degree sprains, 20 second degree sprains, and 19 third degree sprians.

Of the 66 with a first degree sprain the average time loss was 5.5 days. For those 20 with a second degree sprain the average time loss was 17 days.

Between August of 1975 and December of 1978, 8 of the 11 cases of third degree isolated medial collateral ligament injuries were treated surgically. Since January of 1979 to the present all 8 isolated third degree medial collateral ligament injuries were treated with the functional rehabilitation program as outlined. The average time loss for those 11 treated functionally was 33 days. There was one reinjury. This athlete was again treated with a functional rehabilitation program and kept out the remainder of the season. He resumed the next year without difficulty, or reinjury. His clinical examiniation was no different from those third degree injuries treated surgically or functionally. There was only slight laxity noted at 30° of flexion.

In no case of the 105 was a meniscus later excised; all were able to return to contact sports without any recurrence of symptoms.

Conclusion

Functional treatment and rehabilitation has proven quite successful in the treatment of first, second, and third degree medial collateral ligament injuries. Results correlate quite well with those published by Ellsasser and Reynolds[6] and also by Cox, Bergfeld and O'Connor[7].

If one desires to treat a third degree sprain functionally, one must be sure there is no injury to the anterior cruciate ligament, as this may lead to significant funtional instability. Arthroscopy can be quite important in delineating those with possible cruciate injury, particularly when there is a questionable Lachman's test present, or if pain and spasm limit the clinical examination.

Results to date have been encouraging. However, before functional treatment and rehabilitation should be considered the treatment of choice with an "isolated" medial collateral ligament injury, a larger series with long term follow-up is necessary. For those with a first and second degree sprain, it eliminates the guess work as to when they can return to competition and has been demonstrated to have a very low reinjury rate.

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Functional Treatment And Rehabilitation Of Quadriceps, Contusions, Patella Dislocations And "Isolated" Medial Collateral Ligament Injuries

William G. Clancy, Jr., M.D.
James J. Bosanny, ATC

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Questions		a	b	c	d	e
1. With minimal injury to quadriceps muscles, 1. there is some death of muscle fibers 2. there is no affect on motion of the knee 3. there is mild quadriceps spasm 4. an asymptomatic knee effusion may occur	a. 1, 2, 3 b. 1, 3 c. 2, 4 d. 4 only e. 1, 2, 3, 4					
2. Myositis ossificans may occur secondary to a severe quadriceps contusion.	a. True b. False					
3. In the rehabilitation of the athlete with a quadriceps contusion, one should: 1. record ROM at 48 hours for grading of the injury 2. use a cold whirlpool for gentle ROM 72 hours after the injury 3. start a weight training progressive resistance program when there is no tender, firm thickening of the involved muscle 4. start the running program when there is essentially no quadriceps pain and full ROM	a. 1, 2, 3 b. 1, 3 c. 2, 4 d. 4 only e. 1, 2, 3, 4					
4. A complete patellar dislocation can occur with only a tear of the anterior medial capsule.	a. True b. False					
5. Which of the following types of forces is **most** likely to cause a patellar dislocation? a. valgus force b. varus force c. both vargus and valgus forces are equally as likely to cause a patellar dislocation?						
6. Which of the following tests is usually positive in the patient with an acute "isolated" medial collateral ligament injury?	a. Lachman's test b. McMurray's test c. Apley's test d. b and c above e. all of the above					
7. When there has been an injury to the medial collateral ligament, a pseudo locked knee may develop.	a. True b. False					

(Make copies of this page.)

		a	b	c	d	e
8. Which of the following statements is/are true of second degree sprains involving the medial collateral ligament? 1. there is no laxity present to valgus testing at 30° of knee flexion 2. 24-48 hours after the injury, there will be a serosanguineous effusion present 3. the pivot shift test is positive 4. there is marked pain to palpation of the tibial collateral ligament	a. 1, 2, 3 b. 1, 3 c. 2, 4 d. 4 only e. 1, 2, 3, 4					
9. The pivot shift test is _____ when there is a complete tear of the medial collateral ligament.	a. positive b. negative					
10. During the mobilization period of the functional treatment and rehabilitation of patients with "isolated" medial collateral ligament injuries, the patient should 1. discard the knee immobilizer during the day 2. perform guad sets and isometric straight leg lifts with weights for quadriceps, hamstring and hip abductors 3. begin a progressive resistance weight program when there is 90° of painless knee flexion 4. start passive motion exercises utilizing an exercise bike	a. 1, 2, 3 b. 1, 3 c. 2, 4 d. 4 only e. 1, 2, 3, 4					
11. The athlete with an "isolated" medial collateral ligament injury may return to competition when there is 1. minimal pain on flexion of the knee 2. 90% strength, endurance and power as compared to the uninjured leg 3. no laxity at 30° of flexion to valgus stress without pain in those with second or third degree sprains 4. no effusion present	a. 1, 2, 3 b. 1, 3 c. 2, 4 d. 4 only e. 1, 2, 3, 4					
12. If one desires to treat a third degree sprain functionally, there must be no evidence of injury to the anterior cruciate ligament.	a. True b. False					

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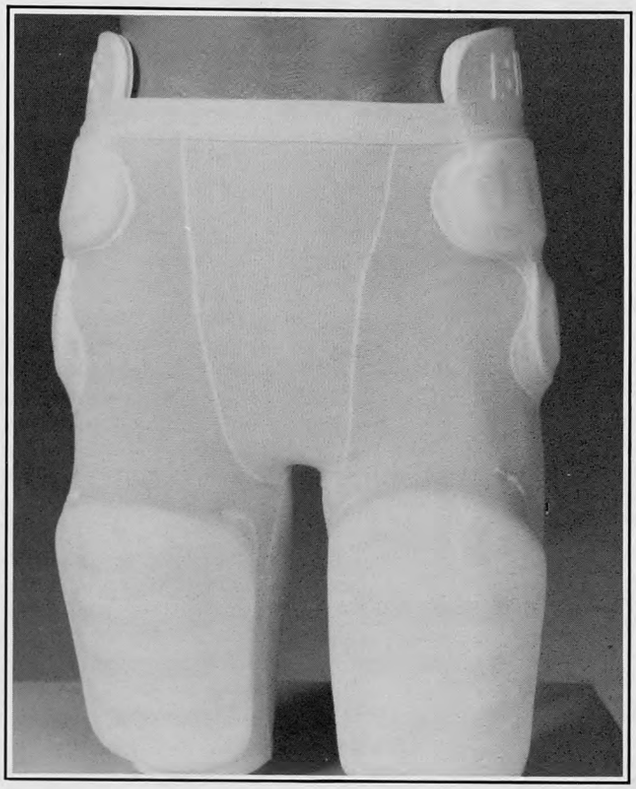

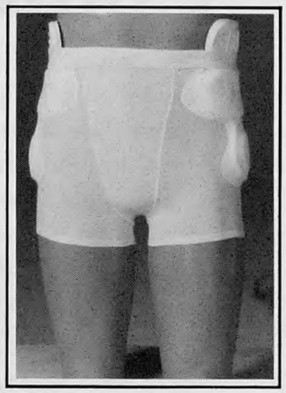

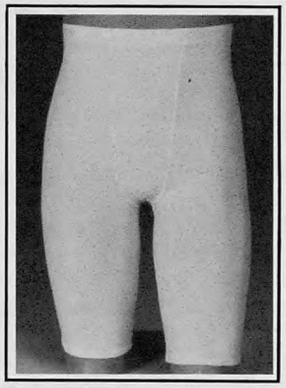

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Effects of Submaximal Contractions Before Isokinetic Testing

Roberta H. Mawdsley, EdD, RPT, ATC
Barbara J. Croft, MS in PT

Various isokinetic strength parameters frequently are evaluated when screening athletes prior to the start of a season. Isokinetic testing often is conducted on a one-time basis. For those athletes who have had no experience with isokinetic exercise, the type of practice that must occur to ensure a safe session and stable measures must be known.

In an isokinetic reliability study performed on three consecutive days, Johnson and Siegel [5] concluded that three submaximal contractions followed by three maximal contractions need to be performed before stable measures occur. Their study did not indicate the subjects' levels of physical activity or if they had isokinetic experience. In a study with inexperienced, sedentary subjects who performed only maximal isokinetic contractions, Mawdsley and Knapik[8] demonstrated that if subjects are to be tested in one session only, at least one maximal contraction should occur before recording criterion strength scores to ensure replicable findings. However, safety considerations may dictate the use of one or more submaximal contractions prior to testing.

As a follow-up to the latter study, the present study was designed to include a pre-test session of three submaximal isokinetic contractions prior to the testing of inexperienced subjects. The purpose of this experimental study was to determine if an isokinetic measure of maximal voluntary isokinetic strength changed significantly among trials between a test group and a control group and within each group. The test group performed submaximal and maximal contractions, and the control group performed only maximal contractions. The null hypothesis was as follows: In the presence or absence of submaximal isokinetic contractions, there will be no significant differences in the mean peak torque (MPT) of maximal voluntary isokinetic contractions (trials) of the knee extensors among trials, between groups, and within each group.

Methods

Twenty-four healthy students (4 males and 20 females) volunteered for this study. All of the subjects were participants in some form of regular physical activity such as jogging or bicycling. Ages ranged from 15 to 34 years with a mean of 20. Subjects did not have a history of knee pathology and did not have experience on an isokinetic appartus. The males and females were divided randomly into two groups to ensure equal numbers of each sex in each group. Group 1 performed three submaximal isokinetic contractions immediately prior to testing; group 2 did not perform submaximal contractions.

An isokinetic dynamometer* was used to assess the strength of the right knee extensors while the subjects were seated on the accompanying S-H-D double width testing table. Strength, as measured in foot-pounds of torque, was recorded on the graph of the dual-channel recorder* using the 360 foot-pound scale. Strength of the knee extensors was defined as the peak torque value produced at a speed of 30°/sec.

Subjects were provided with an explanation of the apparatus and procedures, and informed consent was obtained. Each subject was seated on the table with the right knee at 90° of flexion and with the axis of rotation of the dynamometer aligned with the lateral femoral condyle of the knee joint. If necessary, pads were placed behind a subject's trunk to keep the hips at a common angle (about 105°). The shin pad was secured immediately above the malleoli to allow free range of motion at the ankle. Stabilization straps were secured to each thigh, and a seat belt was strapped across the pelvis to stabilize the hips and limit extraneous trunk movements. Subjects were told to grasp the sides of the seat and to keep the trunk flat against the back of the seat when performing contractions.

Immediately prior to testing, subjects in group 1 performed three submaximal isokinetic contractions of the right knee extensors in gradient increments of torque generation: the torque of each contraction being greater than the preceding one, but less than the following contractions. To confirm this pattern, these contractions were recorded on the graph. After performing these submaximal contractions, subjects rested for one minute before the testing started. Subjects in group 2 were positioned in the apparatus, but they did not perform submaximal contractions.

Testing consisted of six trials with a trial consisting of one maximal isokinetic contraction of the right knee extensors. Beginning with the knee flexed at 90°, each subject was told to kick up as hard and as fast as possible, to complete the entire range of motion, and to relax on the down phase as the leg returned to the starting position. This sequence was followed by a one minute rest before the next trial was executed. Verbal encouragement was given during each trial. At the end of each trial subjective comments about the contraction were noted, and subjects were told their peak torques.

For the purpose of analysis the peak torques which were recorded in foot-pounds were converted to Newton-meters. The mean scores for the trials were compared within each group and between groups using a two-way analysis of variance (ANOVA) with repeated measures[1]. The Newman-Keuls multiple comparison test was utilized to determine where significant differences occurred.

When this study was conducted, Dr. Mawdsley was an Assistant Professor of Physical Therapy and Ms. Croft was a graduate student in the Master of Science in Physical Therapy program at Sargent College of Allied Health Professions, Boston University, Boston, MA 02215.

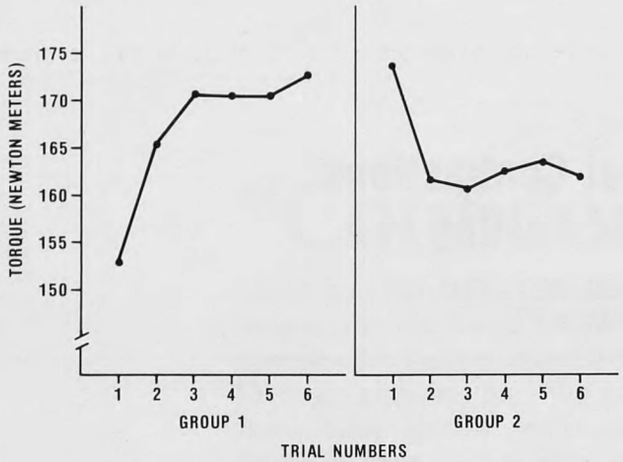

Figure 1. Mean peak torque scores of groups 1 and 2 over six trials of isokinetic testing.

Results

The MPT exerted by groups 1 and 2 at each of the six trials is depicted in Figure 1. The MPT of the first trial in group 1 was the lowest value of the study, while the MPT of the first trial in group 2 was the highest value. In group 1, the MPT started at a low level and then increased in subsequent trials; in group 2, the MPT started at a high level and then decreased in subsequent trials to reach a plateau.

Table 1 presents the results of a two-way ANOVA with repeated measures on the two factors of groups and trials. The main effects of groups and of trials were not significant. However, there was a significant interaction effect ($p < .001$). The Newman-Keuls test indicated that for group 1, trial 1 was significantly different from trials 2 ($p < .05$), 3,4,5, and 6 ($p < .01$) with no other trials significantly different from each other. For group 2, trial 1 was significantly different from trials 2 and 3 ($p < .05$) with no other trials significantly different from each other. Trial 1 of group 1 was significantly different from trial 1 of group 2 (p. .01).

Table 1

Two-way ANOVA with repeated measures on the two factors of groups and trials

Source	of	Sum of Source	Mean Source	F
Between				
Groups	1	327.18	327.18	.02
Error	22	374776.21	17035.28	
Within				
Trials	5	378.08	75.62	1.02
Groups by trials	5	4347.13	869.43	11.68*
Error	10	8190.46	74.46	

*$p < .001$

Discussion

The results demonstrated that MPT presented in the first trial of isokinetic testing (30°/sec) significantly differed from other trials in the presence and absence of three submaximal contractions immediately preceding the test session. The first trials of each group also were significantly different from each other.

Group 2. The significantly high MPT in the first trial was also demonstrated in a similar study by Mawdsley and Knapik[8]. This study demonstrated that when the same subjects were retested on two different days, the first trials displayed the lowest values. In both studies most of the subjects indicated surprise or disappointment that they could not achieve a higher score on the following trials of the first session. These findings suggested that this response is unique to inexperienced subjects whether they are sedentary or physically active. Once they felt the first isokinetic contraction, they were no longer inexperienced, and that initial response could not be surpassed. An inhibitory, self-protective mechanism of the body's neuromuscular system may have been operating in subsequent trials in response to the feel of the first trial. When discussing the concept of isokinetic exercise, Thistle, Hislop, Moffroid, and Lowman [13] indicated that there may be subconscious limitations to voluntary effort in exercise performance. The expression of human strength may be limited partly by psychologically induced inhibitors[4]. Thus, it is important to consider this influence when evaluating a subject's response during isokinetic testing.

Many of the subjects in this group also noted a feeling of discomfort during the first trial with complaints of stress at the knee, pressure around the patella, or an uncomfortable pulling sensation in the knee extensor muscle group. In view of these subjective responses, pretest submaximal contractions need to be performed to help to prevent this discomfort.

Group 1. In an isometric study using a distributed practice schedule, Smith[12] related that there was a close similarity between a strength learning curve and a motor learning curve. In the present study the curve plotted for group 1 (Figure 1) represented one of the typical motor learning curves displaying trial by trial improvement and then tapering off. Sage [10] referred to this type of learning curve as a curve of decreasing returns or a negatively accelerated curve which results when the task is relatively easy and mastery of the movements occurs rapidly.

The significant difference between the MPT in trial 1 and the other trials supported Smith's finding [12] of improved performance during a short practice period and his conclusion that the role of neuromotor learning is an important factor associated with changes in strength.

Part of the purpose of this study was to determine the effect of a pre-test session of three submaximal isokinetic contractions on the isokinetic testing. These submaximal contractions did not seem to allow for enough or an appropriate type of practice to occur to ensure reproducible test trials. One trial of a maximal contraction was necessary before measurements were stable. In a study on the orderly recruitment of human motor units Milner-Brown, Stein, and Yemm[9] demonstrated that the more slowly contracting units were recruited first in voluntary movements involving low tensions. Saltin et al.[11] found that the Type I fibers with slow twitch motor units were involved primarily in dynamic exercise of low or medium intensity. In their summary of studies on motor units, Burke and Edgerton[2] related that fast (FR) and slow (S) twitch fatigue resistant units seem to be involved in most movements which need no more than about 20% of the maximal force output of which a muscle of mixed fiber types is capable. Based on these studies, it appears that S or a combination of S and FR units were utilized during the lower tension submaximal contractions in the present study. As muscle tension progresses to very high intensities during dynamic exercise, Saltin et al.[11] demonstrated that all of the following motor units may be involved: S, FR, and fast twitch fatiguable (FF). Burke and Edgerton[2] related that it seems possible that some movements requiring very forceful contractions may involve selective activation of fast twitch motor units. The maximal isokinetic contractions during testing in the present study

most likely included the recruitment of FF units, either selectively or in addition to the other types of motor units. All of the previous findings and speculations agreed with Laycoe and Marteniuk's findings[7] which suggested that there is specificity of strength in which neuromotor patterns are specific to the amount of contraction. Since the performance of submaximal contractions required different motor units and/or recruitment patterns than the performance of maximal contractions, these differences may have accounted for the first trial of testing not being representative of the following trials.

Although a plateau appeared to occur in trials 3,4, and 5, trial 6 demonstrated an increase in MPT. One may infer from this continuance of an increase in MPT that the highest possible MPT may not have been reached. It may be possible that by performing the three gradient submaximal contractions, more than 6 trials need to be executed to attain the maximal MPT. However, since this study did not utilize more trials, this suggestion cannot be substantiated.

Transfer of learning plays an important role in motor learning[3]. Since the pre-test session did not seem to allow for an appropriate type of practice, a negative transfer probably occurred in which the learning of one task (submaximal contractions) impaired the learning of a second task (maximal contractions). After trial 1, many of the subjects related that they felt as if they had the capacity to push harder. As was noted previously, the MPT produced in all the subsequent trials was greater than in trial one. This subjective information and the low MPT on the first trial support the thesis that a pre-test session only consisting of submaximal contractions is not an appropriate type of practice for isokinetic testing requiring voluntary, maximal effort. Lamb[6] related that some or most of the effectivenesss of skill practice is thought to be due to an activation of the appropriate nerve pathways. Therefore, the pre-test session also should include a contraction or contractions representative of those being tested to ensure that similar neuromotor patterns are used and that negative transfer does not occur.

After the performance of the submaximal contractions, subjects indicated that they felt comfortable with the isokinetic device and were not apprehensive about the testing. None of the subjects experienced any discomfort with the following maximal contractions. This finding is in contrast to the discomfort experienced by many of the subjects in group 2 during or immediately after trial 1. This subjective information seemed to indicate that the three gradient submaximal contractions were adequate to prevent discomfort, decrease the chance of injury, and prevent a decrease in the expression of strength via fear or pain which may cause inhibition of a maximal effort[4].

Limitations. A limitation in this study was the small sample size, since significant differences are more likely to occur with larger groups. Also, strength scores tend to display high variability within subjects which tends to make finding significant differences difficult. It is not known what possible effects the tester had on the results by the knowledge of who performed submaximal contractions and who did not. However, because of inability to locate other studies on pretest contractions, bias in testing probably did not occur since the tester did not know what to expect.

Future Research. There is a need for further studies in establishing isokinetic testing protocols. This study needs to be replicated with a larger number of inexperienced subjects to obtain results representative of the target population. The response of persons who have had isokinetic testing experience may differ from the response of inexperienced subjects. This study examined isokinetic contractions performed at 30°/sec, but higher velocities also are used to screen and treat athletes. Contractions at different velocities have demonstrated different fiber type recruitment patterns[14] which may result in the need for different testing protocols at different velocities. Studies also need to be expanded to include other muscle groups which are tested. Continued experimentation with the goal of establishing isokinetic testing protocols which are safe and provide reproducible findings should be of prime concern to those involved in isokinetic research. Without a testing protocol which can produce replicable measurements, test results are useless.

Conclusions

The effect of the presence or absence of three submaximal isokinetic contractions (30°/ sec) prior to isokinetic testing of six maximal contractions of the knee extensors was investigated. The findings of inexperienced, physically active subjects were as follows: 1) In the presence or absence of three gradient submaximal contractions, trial one was significantly different from some of the other trials; 2) the pattern of MPT differed between groups with trial 1 of group 1 being the lowest value and trial 1 of group 2 being the highest value; 3) the performance of three gradient submaximal contractions prior to isokinetic testing appeared to prevent discomfort during testing.

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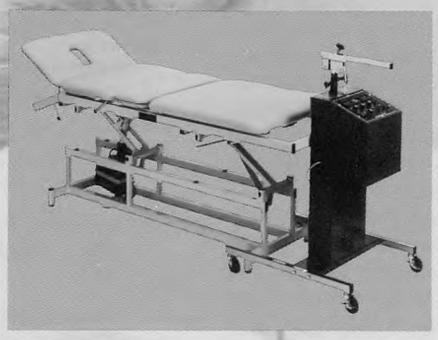

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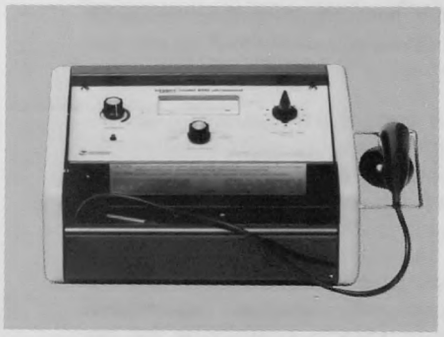

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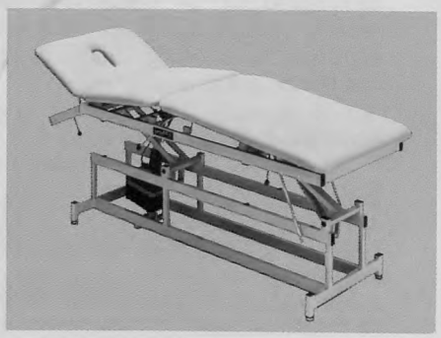

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Case Report:

Combining Faradic Muscle Stimulation and Isotonic Exercise Clinically

Six Case Studies

Andrew Pruitt, MS, ATC

Introduction

Isotonic exercise has long been a standard rehabilitation technique. The active motion involved with isotonic exercise is very beneficial in most rehabilitation cases. However, isotonic exercise programs require sets of repetitions which can become tedious to perform. Also, due to fatigue it is common for the athlete to have trouble maintaining a full voluntary contraction, which reduces the effect of isotonic exercise.

Electrical muscle stimulation has been used widely for muscle rehabilitation, but the use of faradic muscle stimulation is relatively new. Investigation into the use of faradic current began after it was learned that the Russian athletes and trainers were using it in their strength training and rehabilitation programs in preparation for the 1972 Olympic Games.

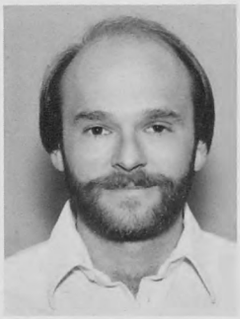
Although faradism has become an established method for re-educating weak muscles, it must be used under close supervisions so that the strength of the involuntary mechanical contraction is strong enough to be beneficial, but not so strong as to cause damage. In addition, faradic stimulation can be an uncomfortable experience for some people.

My idea was to apply both isotonic exercise and faradic muscle stimulation in order to combine their benefits. These combined benefits I believed would minimize the negative aspects of each individual modality. I used this combined approach for two conditions: condromalacia of the patella and lateral ankle weakness.

Materials And Methods

The faradic muscle stimulation unit I chose was the Staodyn EMS (Staodynamics, Inc., Longmont, Colorado). This unit is simple and safe to use, and is portable. It provides a variety of output selections and utilizes small, easy-to-apply electrodes.

I formulated a protocol after reading the available material on faradic stimulation and reviewing the accepted isotonic programs for chondromalacia and lateral ankle weakness. The faradic stimulator was adjusted to give six seconds of muscle contraction alternating with ten seconds of rest. The total length of treatment was ten minutes per muscle group to be worked, four days per week, for at least a month. The athletes had complete control over the degree of contraction, and were instructed to gradually increase the intensity of the contraction within tolerance. I found that they could accommodate a more powerful contraction as the season progressed.



Mr. Pruitt is an athletic trainer at the University of Colorado, Boulder, CO 80309.

The isotonic exercise was designed to repeat the same muscle action being produced by the faradic stimulator. In the case of chondromalacia, the athlete sat comfortably on a treatment table with his/her legs out in front of him/her. A pad was placed under the affected knee which produced 15-20° of flexion. The stimulator electrodes were affixed to the skin directly over the vastus medialis in a distal-proximal fashion. The athlete was then instructed to perform complete extension, the foot should be slightly inverted and the tibia and femur slightly internally rotated, in harmony with the involuntary contraction produced by the faradic stimulator. Ankle weights were added in some cases.

In the case of lateral ankle weakness, the athlete sat comfortably on a treatment table with a pad under the affected leg at the gastrocnemius, and with the foot and ankle totally relaxed. The stimulator electrodes were affixed to the skin directly over the peroneus longus and brevis muscles in a distal-proximal position. The athlete was then instructed to perform complete eversion in harmony with the involuntary contractions produced by the faradic stimulator.

Case Studies

Case 1. P.S. is a 22-year-old male decathlete suffering from bilateral chondromalacia of the patella. His patella had a distinct lateral tracking pattern. He was withheld from all activities that aggravated the problem, and was put on a standard physical therapy program of ice and ultrasound. He was also placed in the rehabilitation program of combined isotonic exercise and faradic muscle stimulation for one month. At the end of one month he began a gradual return to his normal training program with only occasional minor flare-ups of chondromalacia. Both the standard physical therapy program and the combined rehabilitation program were continued for another month. The athlete is now free of symptoms.

Case 2. A.E. is a 25-year-old female professional alpine ski racer suffering from unilateral chondromalacia of the patella. She had no noticeable lateral tracking pattern, but her painful symptoms were suggestive of a need to strengthen the vastus medialis. She was placed on a standard physical therapy program of ice and ultrasound, and was allowed to continue isotonic exercise and muscle stimulation. She continued both the therapy and the combined rehabilitation programs for five weeks. She is now in mid-season and is symptom-free.

Case 3. C.G. is a 25-year-old female world-class bicycle racer suffering from bilateral chondromalacia of the patella. Examination showed an obvious overdevelopment of her lateral quadriceps muscles and a lateral tracking of her patella upon contraction. She was taken off her bicycle for two weeks to permit the inflammation to diminish. After some reduction of the inflammation, she resumed riding her bicycle, using only an easy spin. She was started on the standard physical thera-

py program of ice and ultrasound, and was placed on the combined program of isotonic exercise and muscle stimulation. Within one month of therapy and rehabilitation, her symptoms were minimized with an obvious development of her vastus medialis. Because of a move, she was forced to discontinue participation in the program.

Case 4. M.M. is a 21-year-old male collegiate alpine ski racer suffering from lateral instability of the ankle. Due to this instability the athlete was unable to participate in his dry land training program without recurrent inversion sprains. His dry land training program was altered slightly. Physical therapy was performed daily according to the symptoms displayed that day. He underwent the combined isotonic exercise/muscle stimulation program for one month, at which time he began to ski. Since then he has experienced minimal problems while skiing, and relates a feeling of improved confidence from significant strength gains.

Case 5. D.F. is an 18-year-old female collegiate tennis player who suffered a third degree inversion sprain of the ankle. After subsequent open surgical repair, she was casted for six weeks. Windows were cut in the cast to enable the anterior tibialis and the gastrocnemius to be exercised with the faradic muscle stimulator. When the cast was removed, minimal atrophy was found. She also had an exceptional range of motion, and inversion was stable.

No tendons were involved in the surgical repair. For this reason it was safe to start the combined isotonic exercise/muscle stimulation program for her peroneals while continuing to work all other ranges of motion with progressive resistance. Her ankle was never painful or swollen during the rehabilitation period. According to pre and post-Cybex readings, her strength and range of motion returned to normal 25° faster than average.

Case 6. J.A. is a 19-year-old female collegiate basketball player who suffered a second-plus degree inversion sprain of the ankle, as diagnosed by stress X-rays. It was decided that she would be treated conservatively, but not casted so she could receive daily physical therapy and rehabilitation.

Therapy during the first week consisted of crutches; Jobst intermittent extremity pump with ice one hour daily; compression wraps; periodic ice; and exercise of all pain-free ranges of motion. The second week consisted of crutches; compression wraps; periodic ice, exercise of all pain-free ranges of motion; and the addition of mild faradic stimulation of the peroneal group. There resulted a significant decrease in swelling and pain after the second week. Week three consisted of ambulation; compression wraps; periodic ice, exercise of all pain-free ranges of motion; and the addition of the combined isotonic exercise/muscle stimulation program for the peroneals. Week four was structured identically to Week three, with jogging and straight-ahead sprinting added. For Week five, cutting and basketball drills were begun. At the sixth week she returned to full practice with a strong and healthy ankle. However, the physical therapy and rehabilitation programs were continued for one more month.

Discussion

From my experience with these six athletes, I believe that isotonic exercise and faradic muscle stimulation applied in combination are a successful means to rehabilitate chondromalacia and lateral ankle weakness. Further, I believe that this combined technique can be used with good results in many other rehabilitation protocols.

Isotonic exercise and muscle stimulation combined made it possible to produce a complete muscle contraction with each repetition. Used with isotonic exercise, the faradic current was made more tolerable to the athlete and, for some, even comfortable. It has been known for some time that isometric contractions are the best way to gain strength. The technique I used combines isotonic contraction with the tetany of isometrics. The faradic muscle stimulator enables the desired muscle to be isolated, especially in the case of the peroneals.

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ROLE DELINEATION STUDY for the CERTIFICATION EXAMINATION for ENTRY-LEVEL ATHLETIC TRAINERS

Paul Grace, MS, ATC
Linda Ledderman, MA

This article is a brief abstract of the Role Delineation Study which was recently completed.

In 1982, the National Athletic Trainers Association and the Professional Examination Service conducted a study of the most appropriate content for the Certification Examination for entry-level athletic trainers. The examination is used nationally as part of the certification process for athletic trainers. The study focused on the necessary content for a job-related examination, and within that content, on (1) the major performance domains of responsibility, (2) the tasks associated with each domain, and (3) the knowledges required to perform each of the tasks.

The study consisted of the following phases:

(1) Development of the domains, tasks, and knowledges by a role delineation panel of the Board of Certification.
(2) Ratings and determination of percentages of preliminary tests specifications by the Role Delineation Panel, and
(3) Independent review and validation of the test specifications by certified athletic trainers in a national sample.

Development of the Role Delineation and Preliminary Test Specifications

In order to develop a role delineation and preliminary test specifications, the following methodology was used by PES:

(1) A nine-member panel of certified athletic trainers, representing the various disciplines of athletic training and geographic differences, met for a two and one-half day meeting. Using a modified nominal group technique, the panel identified and defined six major performance domains of practice. (Performance domains are defined as the principle areas of responsibility comprising the profession of athletic training). The performance domains identified by the panel are: (a) Prevention, (b) Recognition and Evaluation, (c) Management/Treatment and Disposition, (d) Rehabilitation, (e) Organization and Administration, and (f) Education and Counseling. It was the determination of the panel that these performance domains encompassed the full range of professional activities in which athletic trainers may engage.
(2) Upon completion of identifying the six domains, each was broken into its component tasks, written in the form of task statement. (A task statement is a format used in the compilation of distinct, identifiable work activities).
(3) The panel then proceeded to identify the learnable knowledges and skills associated with the performance of each task.
(4) The panel reviewed the domains, tasks and knowledges and then rated each. The domains, tasks and knowledge and skill statements were edited by PES staff after the meeting. They were then sent to the nine-member panel for review and modification before undertaking the validation study.

Mr. Grace is Chairperson of the Board of Certification and Head Athletic Trainer at Massachusetts Institute of Technology, Boston, MA 02139. Ms. Ledderman is a Program Associate, Professional Examination Service.

Procedures of the Validation Study

The role delineation, including the task, knowledge and skill statements was sent to 300 certified athletic trainers. These trainers were from each geographic area of the United States and worked in different athletic training situations (major league sports, college and high school sports, and college and high school teaching). They were asked to rate the tasks and knowledges on the same scales as the role delineation panel. The participants were also asked to determine the percentages of each area of the examination.

Results of the Validation Study

For the purpose of finalizing the test specifications for the examination, the most direct measure (percentage of the examination) is the most useful. Table 1 presents the percentages and the number of items assigned to the major domains by the respondents. As can be seen in Table 1, the percentages assigned are Prevention 18%, Recognition and Evaluation 24%, Management/Treatment and Disposition 22%, Rehabilitation 20%, Organization and Administration 9%, and Education and Counseling 7%.

Table 1

Number and Percentage of Items in Each Domain as Determined by the Validation Respondents

Domain	Number of Items*	Percentage of Items*
Prevention	27	18%
Recognition and Evaluation	36	24%
Management/Treatment and Disposition	33	22%
Rehabilitation	30	20%
Organization and Administration	13	9%
Education and Counseling	11	7%
	150 items	100%

* Rounded

Table 2

Number of Task Statements per Domain

1. Prevention	9
2. Recognition/Evaluation	6
3. Management/Treatment	4
4. Rehabilitation	3
5. Organization/Administration	6
6. Education/Counseling	6

An example of a task statement with knowledge statements is as follows:

Domain:

Prevention (Preparticipation, Environment, Equipment)

Task 1.

DOMAIN 1

PREVENTION (PREPARTICIPATION, ENVIRONMENT, EQUIPMENT)
Task 1. Develops and implements specific programs for athletes for pre-season, in-season, and off-season conditioning in order to assure optimal physical readiness for organized athletic activity by using strength, flexibility, and endurance activities.

KNOWLEDGES:

1. Knowledge of short and long term effects of physical training as it affects respiratory, circulatory, nervous, digestive, and musculoskeletal systems.
2. Knowledge of muscular strength and endurance training principles and techniques (e.g., isometric, isotonic, and isokinetic training).
3. Knowledge of muscle physiology.
4. Knowledge of flexibility training principles and techniques (e.g., static, dynamic, P.N.F., etc.).
5. Knowledge of cardiovascular endurance training principles and techniques (e.g., interval, circuit, distance work, etc.).
6. Knowledge of neuromuscular coordination and skill acquisition techniques.
7. Knowledge of strength training equipment (e.g., isokinetic, isotonic, isometric training devices, etc.).
8. Knowledge of specific sport and/or position requirements for conditioning relative to pre-season, in-season, post-season time frames.
9. Knowledge of safety principles as related to weight training techniques (e.g., spotting, dangerous lifts, overtraining, etc.).
10. Knowledge of motivational techniques and group dynamics as it relates to conditioning activities.

SKILLS:

1. Skill in directing strength, flexibility, and endurance development activities.
2. Skill in designing programs specific to the athlete's individual needs as to sport position and/or activity.
3. Skill in identifying unsafe strength training equipment.

DOMAIN 2

RECOGNITION AND EVALUATION
Task 2. Inspects the injured area of the athlete in order to determine the presence and/or extent of deformity, discoloration, bleeding, effusion, and obvious pathological signs and symptoms by removal of clothing and/or athletic equipment and bilateral comparison when appropriate, using knowledge of human anatomy, physiology, and kinesiology.

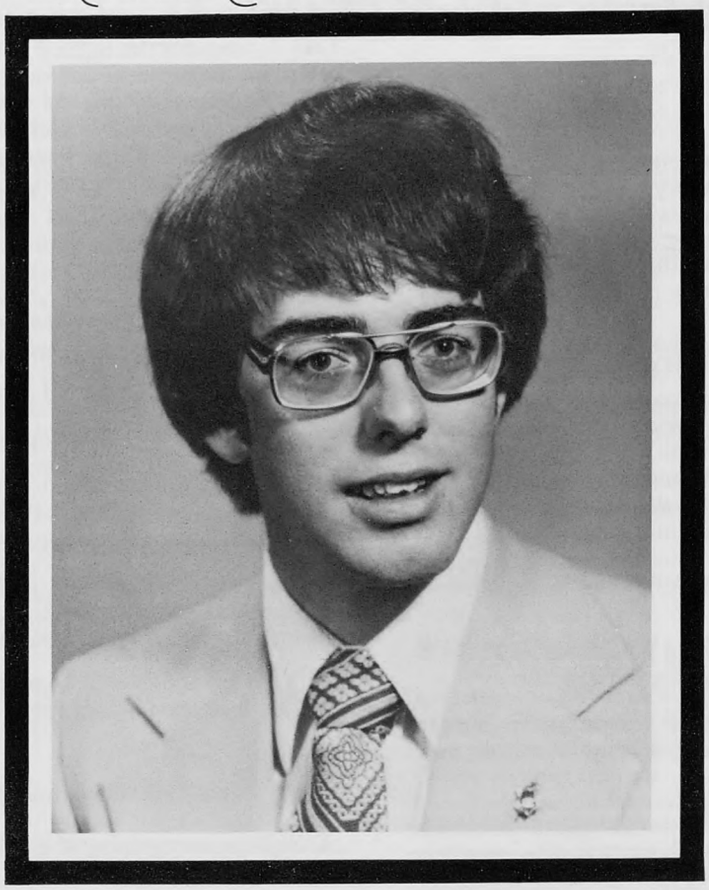
KNOWLEDGES:

1. Knowledge of human surface anatomy specifically boney landmarks and soft tissue conformations.
2. Knowledge of signs and symptoms of athletic injuries.
3. Knowledge of physiological response to injury (e.g., pupils, shock, inflammation, bleeding, etc.).
4. Knowledge of medical terminology and standard nomenclature of athletic injuries.
5. Knowledge of normal and abnormal structural relationships as they relate to the mechanisms of athletic injuries (e.g., valgus knees, varus forefoot Q angle, etc.).
6. Knowledge of human anatomy — specifically the circulatory and nervous systems.

SKILLS:

1. Skill in recognizing the relationships and severity of pathological signs of athletic injuries.
2. Skill in identifying abnormalities of boney landmarks and soft tissue conformations of specific injuries.
3. Skill in assessing the body's immediate and delayed physiological responses to injury.
4. Skill in assessing preexisting structural abnormalities and relating them to mechanisms of injuries. +

In Memoriam



Charles E. Wershing
November 13, 1956 — May 8, 1982

Charles Wershing, the athletic trainer for Northmont High School in Clayton, Ohio, died on May 8, 1982. He was 25 years old.

Charles graduated from North Olmstead High School in North Olmstead, Ohio, in 1975. He then went to Ashland College where he received his Bachelor of Science degree.

Upon graduation Charles enrolled at Miami University where he continued his work as a graduate trainer. In 1980 he received his Master of Science degree.

From 1980 until his untimely death, Charles served as a teacher/trainer at Northmont High School. He will be sadly missed by the students, athletes, and coaches at Northmont.

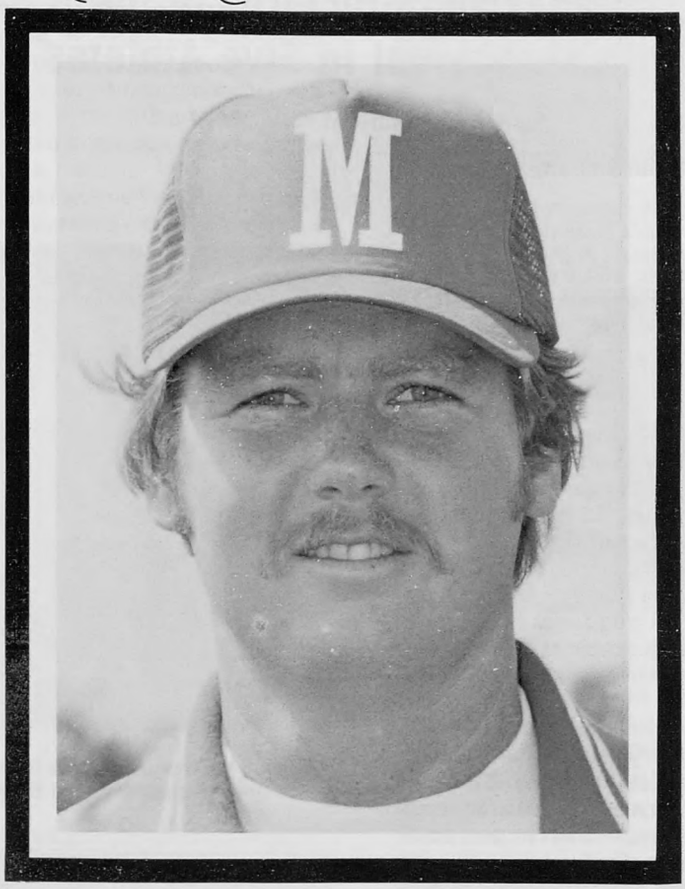
Surviving him are his parents, Charles and Thora, brother William, and sister Betty Lou. Grandparents surviving are Mrs. Rachel Wershing and Mrs. Naddine Smallsreed.

The family requests individuals send memorial contributions to:

Charles E. Wershing Memorial Fund
Northmont Athletic Department
c/o Ralph Ramsey
4916 National Road
Clayton, Ohio 45313

Dying, you destroyed our death. Rising, you restored our life.

In Memoriam



Steven K. Bowman
December 30, 1950 — July 29, 1982

Steve Bowman was a 1969 graduate of Fargo South High School in Fargo, North Dakota. In high school he was active in athletics, competing in football and ice hockey.

Following his graduation he enrolled at North Dakota State University. There he majored in physical education and athletic training.

Upon graduation from NDSU in 1974, Steve was named acting head trainer there for the 1974-75 athletic season. This position was a one-year sabbatical replacement for Denis Isrow.

From 1975 until 1978 Steve was involved in a private business venture. Steve Bowman rejoined the athletic training profession in 1978 when he was appointed to the staff of Moorhead State University in Minnesota under the CETA program. A year later this position became a full-time position.

Steve was the first trainer in the history of intercollegiate athletics at Moorhead State University. He served both the men's and women's athletic teams while at Moorhead State.

Steve is survived by his wife, Carol; his mother, Mrs. Kay Bowman; and father, Richard Bowman; two sisters and a brother, Mrs. Eric (Sandi) Matson, Beth and Larry Bowman.

Steve Bowman's untimely death was a shock to all his family, friends and athletes. This young man taken too early in his life by cancer will be missed by all who knew him.

Case Report:

The Jones Fracture — Review of Proximal Diaphyseal Fractures of the Fifth Metatarsal in Five Athletes

Bruce C. Johnson, ATC, Med

The fifth metatarsal is a vulnerable and frequent area of injury in athletes. Two kinds of injuries are especially frequent. One involves an avulsion of the tuberosity at the base of the fifth metatarsal and the other involves a fracture of the proximal diaphysis approximately three-quarters to one inch from the base.

There is a very distinct difference between the two fractures and their healing times, although they have had the misfortune of being labeled the same. The true Jones fracture as originally described by Robert Jones in 1902 involved the proximal diaphysis of the fifth metatarsal[1] (Fig. 1). Authors through the years have erroneously altered this description to include avulsion fractures of tuberosity by the peroneus brevis tendon.[2-5] Literature is scarce on true Jones fractures as they relate to athletics although various authors have distinguished between tuberosity fractures and diaphyseal fractures.[1,2,4-9]

A fracture of the proximal shaft of the fifth metatarsal (Jones fracture) is an aggravating injury that will quite readily predispose itself to reinjury if not treated properly. The fracture is unpredictable in its healing time and reaction to treatment. An athlete who incurs a Jones fracture has no guarantee that it will heal properly if at all. Non-union fractures are quite common at this site and reinjury during healing occurs frequently[2,5,7,9] (Fig. 2 and 3). Hasty decisions and apathy due to the innocent appearance of the Jones fracture can lead to a most unhappy athlete.

The purpose of this paper is to present theories associated with fifth metatarsal fractures with the primary focus on Jones fractures.

Figure 1 Original fracture of the proximal diaphysis of the fifth metatarsal as described by Robert Jones in 1902. (Reprinted by permission from the J.B. Lippincott company, Philadelphia).

Mr. Johnson is presently Athletic Trainer and Orthopaedic Assistant at the Orthopaedic Clinic, P.C., in Grand Forks, North Dakota 58201.

Figure 2 Non-union Jones fracture. This particular fracture was initially incurred five months earlier.

Figure 3 Reinjuried Jones fracture. Note fracture in callus formation. Initial injury was eight months earlier.

Anatomy

The proximal portion of the fifth metatarsal is bound very tightly to the cuboid and the fourth metatarsal by strong ligaments. Jones described the cuboid-fifth metatarsal-fourth metatarsal articulation as being so powerful that it was easier to fracture a bone than to dislocate it.[1]

The fifth metatarsal base has a variety of structures attached to it that include tendons of the peroneus brevis, peroneus tertius, flexor digiti minimi and abductor digiti muscles, a slip of the plantar fascia, and the joint capsule.

Dameron[2], through dissection found the peroneus brevis attachment point on the tuberosity of the fifth metatarsal to be four times as broad as the diameter of the tendon itself. Avulsion fractures can be attributed to this sturdy insertion on the metatarsal tuberosity.[2-5] The peroneus tertius has a less sturdy insertion on the metatarsal shaft just distal to the tuberosity and probably has little to do with avulsion fractures.

Tuberosity Avulsion Fractures

There is general agreement that avulsion fractures of the tuberosity are caused by inversion and plantarflexion of the foot.[2,3,4,10,11] Inversion of the foot causes a contraction of the peroneus brevis which inserts on the tuberosity of the base of the fifth metatarsal. The tuberosity generally fractures before the peroneus brevis ruptures. Diagnosis is easily made by point tenderness at the fracture site and roentgenographic examination (Fig. 4). Care must be taken to differentiate between a true fracture and a secondary ossification center in chidlren under fourteen years of age.[2] When secondary centers of ossification become visible on the fifth metatarsal they can appear to be obliquely oriented in relation to the metatarsal shaft and thus resemble a fracture.

The avulsion fracture is uncomfortable but can be treated symptomatically.[2,3,7,10,11] Treatment may consist only of an elastic wrap and crutches, or taping. Patients often feel better when wearing a hard soled shoe during ambulation. Three or four weeks in a cast is also a treatment of choice if ambulation is painful. Problem avulsion cases can also be resected although this is more the exception than the rule.

Figure 4 Avulsion fracture of the tuberosity of the base of the fifth metatarsal.

Proximal Diaphyseal Fractures (Jones Fractures)

The mechanism of injury in a Jones fracture is questionable. Robert Jones originally described how he trod on the outer side of his foot while dancing, causing a fracture. He described how his heel was off the ground at the moment of impact. Jones reasoned that since his heel was raised, the body weight was expended upon the fifth metatarsal rotating slightly inwards. The opposition to this force was taken at the base.[1] Other cases described by Jones related an inversion of the foot with body weight coming down on the side of the foot.

Zelko, Torg, and Rachun described three mechanisms of injury for twenty confirmed Jones fractures.[9] Included were twisting in inversion, spontaneous fracture on running and an inversion-external rotation mechanism.

Kavanaugh, Brown, and Mann have questioned the inversion mechanism of injury theory.[7] Their work using cinematographic analysis showed large vertical and mediolateral forces to be responsible for the injury without the foot going into inversion. They concluded that the Jones fracture was not a result of an inversion of the foot and could be produced with the heel on the ground as well as off the ground.

The author of this article has seen five University of North Dakota athletes who incurred seven Jones fractures. The mechanism of injury in five of the seven Jones fractures (includes reinjuries on two patients) was that of landing on the lateral side of the foot without actual inversion of the ankle (Fig. 5). The remaining two cases involved an "accidental" finding of which the mechanism of injury was unknown, and one which involved a quick forward push off the foot while the foot was in dorsiflexion (Fig. 6). The "accidental" finding occured on a basketball player when a roentgenogram was taken for a plantar fasciitis problem.

Figure 5 Mechanism of injury for the Jones fracture without inversion. Full weight bearing is borne by the base of the fifth metatarsal with slight heal elevation.

Figure 6 Mechanism of injury for the Jones fracture with full weight bearing on the fifth metatarsal. The heel is raised and the ankle dorsiflexed.

Four of the five athletes were playing basketball at the time of their initial injury. Three of the five had first time injuries that were examined immediately. Two of the five athletes reinjured (fractured) the fifth metatarsal three months and seven months respectively, following the original injury. The three first time injuries were treated conservatively with no weight bearing allowed for one month. None were casted. One fifth metatarsal healed in four months while another took 4½ months to heal. Healing time was unable to be determined on one fifth metatarsal as follow-up roentgenograms were not repeated for approximately 3½ years following the initial injury. The two recurrent injuries were corrected surgically and both healed in three months following cancellous screw fixation.

Treatment

Conservative Management of Jones Fractures

Treatment of the Jones fracture should be individualized according to the activity level of the patient. If the patient is rather sedentary and is willing to remain so for a prolonged time, no treatment may be necessary other than the application of an elastic wrap or soft dressing. The treatment is very similar to the tuberosity fractures discussed earlier.

If the attending physician wishes to follow the conservative route, the application of a cast is recommended for athletes due to their active nature.[4,9] Casting time varies greatly but does not appear to alter healing time, very similar to the tuberosity avulsion fractures. Jones fractures have taken as long as twenty to twenty-one months to heal.[2,9] There is a tendency to remove the cast after a three to four week period and allow normal activity even though the fracture site has not demonstrated healing radiographically. While the patient may perform adequately, the risk of vigorous activity before consolidation is apparent. Kavanaugh and his associates[7] and Zelko and his associates[9] reported refractures in approximately 50 percent of their conservatively treated patients with Jones fractures.

Adequate union time varies depending on the activity level of the patient during healing. Casting has not been shown to decrease healing time as compared to full ambulation and weight bearing as tolerated.[2,7,9] Dameron[2] reported on 100 tuberosity fractures (not all athletes) in which all but one healed radiographically in two months or less. The long term prognosis for avulsion fractures is good.

Surgical Management of Jones Fractures

Bone grafting and screw fixation are two alternatives to conservative treatments. Open fixation has been shown to produce better and quicker results than conservative management.[2,6,7,9] Regardless of which operative technique is involved, the sclerotic bone and debris must be reemed from the intermedullary canal to insure good results.

Dameron's five surgically repaired Jones fractures consisted of bone grafts that healed in eight to ten weeks.[2] Kavanaugh and associates operated on thirteen Jones fractures using a cancellous bone screw or a curved Leinbach screw. Each fracture healed clinically at six weeks and radiographically at three months.[7] Zelko and associates reported on nine Jones fractures utilizing an inlay graft. Eight of nine patients healed in three to four months while one patient refractured his metatarsal seven months after surgery.[9]

Rehabilitation

The therapist must be careful not to begin a rehabilitation program when the fracture site is not healed. As outlined earlier, the base of the fifth metatarsal has numerous muscular and tendinous origins and insertions. Needless activity will understandably be detrimental if initiated too quickly.

Conservatively treated Jones fractures require little rehabilitation as ambulation is possible with full range of motion of the foot and ankle. Swimming is encouraged for cardiovascular fitness. Because Jones fractures take a long time to heal, conservative treatment requires a trusting and mature athlete.

Surgical repairs and immobilization of Jones fractures are protected adequately but immobilization produces the well known range of motion loss, strength loss, and atrophy. Quadriceps and hamstring muscle groups should not decrease in strength post operatively. The knee has full range of motion at all times, thus allowing exercise through this range. The author has utilized the Orthotron* to insure muscle tone during the immobilization period. Dry weights can also be used but the athlete must be careful of cast breakdown as a result of the heavy weight on the lower leg. Cardiovascular conditioning can be maintained by utilization of an exercise bicycle routine. The casting foot can easily be strapped to the pedal to maintain contact.

Once the cast is removed, active range of motion is encouraged along with strengthening exercises. If warm whirlpool baths are used, "alphabet" range of motion with the foot is very helpful. "Alphabet" range of motion simply involves moving the foot and ankle in the form of the letters of the alphabet. It is a very simple but effective exercise to increase range of motion. The Orthotron can once again play an important role in rehabilitation of the lower leg through plantarflexion and dorsiflexion exercises. The author prefers the use of elastic straps placed around the forefoot of each foot to strengthen the evertors of the ankle. The athlete sits with the knees bent with a rolled up towel between the malleoli. Elastic straps are placed around the forefoot of each foot. Eversion of the ankle is performed with a five second hold. Rising up on the toes in neutral, internal rotation, and external rotation positions of the feet are of further value in strengthening the foot and ankle. Small foot muscles are strengthened by use of the towel pull with the toes.

Regardless of what rehabilitation program is used, a well thought out program and knowledge of the injury is essential for proper care.

Discussion

The question of whether a foot goes into inversion, or an ankle is sprained as a result of an inversion force, is academic. It is questionable whether a proximal diaphyseal fracture can occur with a true inversion of the foot or ankle in plantarflexion so often described in avulsions and sprains. Does one mean that the ankle was twisted as to cause a sprain or that one landed on the outside of the foot? Inversion of the ankle or foot is a catch-all term that is often used when inversion probably never occured as when landing on the lateral side of the foot (Fig. 5).

Summary

The Jones fracture is a debilitating injury that must be differentiated from the more common tuberosity avulsion fracture. The therapist must recognize the distinct characteristics of each. True Jones fractures show a high propensity for delayed or non-union. Many athletes have suffered through painful months because of relative apathy and the seemingly innocent appearance of the fracture.

Surgical repairs appears to show the most promise for early consolidation whether it be grafting or cancellous screw fixation. Athletes in particular should carefully consider surgical fixation if they are wishing to return to activity in the shortest possible time. Conservative treatment is occasionally quite prolonged due to the extended sedentary periods required to heal the fracture. Many athletes will find this extremely difficult to accept. Precisely this fact is what produces so many reinjuries of this fracture.

Acknowledgements

The author wishes to thank Judy Tuchscherer, Chief Radiologic Technician at the Medical Center Rehabilitation Hospital and Audrey Shea from the Orthopaedic Clinic, P.C., in Grand Forks, North Dakota for their assistance.

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AT-W82

Abstracts

John Wells, ATC, PT, PhD
Mars Hill College

"Dehydration and Its Effects Upon Endurance Activity," Stone, Bruce. *Athletic Journal:* 14, 64, June 1982.

It is essential that endurance athletes know and heed the signs of dehydration. During exercise, the primary source of heat loss occurs through our sweat glands; through evaporation, this slightly saline solution is removed from the skin. As body fluids are dissipated to maintain thermal balance, fluid available for cooling will diminish and dehydration consequently occurs. Unless these fluids are replaced through rehydration, the availability of sufficient body fluid for thermal balance may reach dangerously low levels. It is imperative that an individual drink before, during and after an endurance activity. When the water loss of the athlete is about .5 quarts per hour or if he/she loses three percent of his/her body weight, a reduction of blood volume occurs. If the activity is not reduced in intensity and fluid intake increased, circulatory collapse may occur. Because the skin, like a hot box, prevents the escape of heat and creates a potentially deadly internal body environment. This assumption is not dependable because through vasoconstriction of blood volume, heat transfer is severely hindered. Although most people, when confronted with heat cramps and heat exhaustion, will stop their activities and seek relief, conditioned and highly motivated athletes may feel invincible. They mistakingly figure they can overcome any obstacles. Wet and clammy skin, muscle cramping and spans of lightheadness will not stop them from finishing that race or continuing to practice. If the activity is not stopped or reduced in intensity, and fluid loss replenished, heat stroke or even death can occur.

George Jarrett, III

"The Anterior Cruciate: A Dilemma In Sports Medicine," Johnson, R.J., *International Journal of Sports Medicine.* 2(3): 71-79, May 1982.

Until recently the frequency of complete disruption of the ACL was felt to be less than that of the medial collateral ligament (MCL). However, several reports indicate that it is probably the most commonly totally disrupted ligament within the knee. Classically the anterior drawer test has been utilized to demonstrate the integrity of the ligament. The author believes that a positive anterior drawer test, when correctly interpreted, indicates that the ACL has sustained damage, but a negative anterior drawer test does not necessarily mean that the ligament is intact. Several factors contribute to the possibility of a falsely negative drawer test. First, the test requires the knee to be flexed to 90°. In the acutely injured knee, the presence of a traumatic effusion and pain may render it impossible for the patient to flex the knee to 90°. Second, involuntary or voluntary contraction of the hamstring muscles may effectively mask the presence of instability in the unanesthetized patient. Third, intact menisci are likely to block anterior displacement of the tibia on the femur when the knee is in 90° of flexion. Fourth, in relatively tight knees, capsular structures may be able to substitute for the function of the ACL well enough to mask its disruption. However, the patient may feel instability occur when seemingly simple activities such as cutting, turning, jumping, or sudden starts or stops result in what the patient interprets as a painful displacement of the femur on the tibia often associated with giving away. A false positive anterior drawer sign also may confuse the examining physician as MCL and medial capsular laxity which allow anteromedial rotary instability may appear incorrectly to demonstrate damage to an intact ACL. Another error sometimes resulting in a false positive anterior drawer test with ACL instability. When the knee is flexed to 90° while the patient is supine, gravity tends to drop the tibia posteriorly. If the examiner ignores this fact, the increased laxity observed on performing the drawer test may be misinterpreted. In view of the problems of interpretation associated with the anterior drawer test, a second maneuver is strongly suggested. Torg et al. termed it the "Lachman Test". The Lachman test has several advantages over the anterior drawer test: (1) it does not require the knee to be flexed further than 20°; (2) in the position of slight flexion, hamstring muscle spasm has less ability to prevent anterior motion by reducing the effective moment arm of the hamstrings; (3) the blocking effect on anterior tibial displacement by the posterior horns of the menisci is reduced by contacting the menisci with that portion of the femoral condyles with the largest radius of curvature; (4) rotary instability which may result in a false positive anterior drawer sign using the standard drawer test is not a confounding factor; (5) when the anterior drawer test is falsely negative the shift demonstrates in a dramatic fashion the functional integrity of the ACL and provides the clinician with another means of confirming the observations obtained by either the classic anterior drawer test or the Lachman test. Relatively few individuals with a torn ACL do not demonstrate this phenomenon. Perhaps the most controversial factor concerning the ACL-deficient knee is the expected course of the untreated joint. A factor adding to the confusion concerning the natural history of ACL disruption is that initially many patients apparently do well with no treatment or excision of the acutely torn ligament. Kennedy and his associates in 1974 reported that they could find no difference in results of patients treated with muscle rehabilitation following acute ACL disruption and those who underwent early repairs. The average follow-up during this study was 44 months. However, after re-evaluation of the same group of patients at 88 months, Kennedy found that those joints which had not been repaired were much more frequently developing severe complications than those which had undergone early repair.

D.A. "Bru" Brubaker

"Contralateral Effects of Upper Extremity Proprioceptive Neuromuscular Facilitation Patterns," Marilyn Pink, *Physical Therapy: The Journal of the American Physical Therapy Association.* 1158-1161, August 1981.

Proprioceptive neuromuscular facilitation (PNF) techniques are widely used in therapeutic exercise programs. One of the contentions of PNF is that it can cause a contraction of muscles in the contralateral extremity during unilateral exercise. The literature has revealed two possible explanations for

patterns of contralateral effects. One theory is based on the overflow of impulses from the muscles that are directly being exercised. The impulses are thought to be directed to muscles corresponding to the agonists or antagonists of the limb under-going resisted exercise. The other theory is based on biomechanics: the effects are due to stabilization of the contralateral side when resistance is applied to the exercised limb. The PNF pattern chosen for the study was flexion, abduction, and external rotation with elbow straight (called the flexor component) and extension, adduction, and internal rotation with elbow straight (called the extensor component). Electromyography was used to determine the presence of electrical activity in the nonexercised latissimus dorsi, infraspinatus, and pectoralis major muscles while the contralateral limb underwent the proprioceptive neuromuscular facilitation pattern of flexion, adduction, external rotation with elbow straight. The results of this study indicate that unexercised muscles do become active during resisted upper extremity PNF patterns in normal subjects when the contralateral limb undergoes an upper extremity PNF pattern. There was no significant difference in activity for the pectoralis major muscle during the flexor as compared to extensor component. The infraspinatus was more active during the flexor component, while the latissimus dorsi was more active during the extensor component. These results could be used in planning a treatment program for patients who are unable to exercise one of their upper extremities and who could benefit from the contralateral effects of upper extremity proprioceptive neuromuscular facilitation patterns.

Lois Howard

"Energy Expenditure During Ambulation with Ortho Crutches and Axillary Crutches," Catherine A. Hinton and Karen E. Cullen, *Physical Therapy: The Journal Of The American Physical Therapy Association*. 6: 813-819, June 1982.

For patients required to walk with a nonweight-bearing (NWB) gait, the choices of assistive ambulatory devices are limited to crutches and walkers. Because of the greater mobility they afford, crutches are generally chosen over walkers for both young patients and older patients with adequate balance. Nonweight-bearing ambulation with crutches requires more energy expenditure than normal, unassisted ambulation. Energy costs of different types of crutches are not reported as a clinical consideration, however, in the selection of a particular type for a specific patient. The purpose of this investigation was to determine whether significant differences exist in energy cost (measured by oxygen consumption), heart rate, and blood pressure during three-point NWB ambulation with axillary crutches and Ortho crutches and during unassisted ambulation. Responses were measured at the subject's self-selected speed for each mode of ambulation. Energy expenditure was determined by analyzing expired air collected by a calorimeter. Heart rate was monitored by telemetry. During the first 2.5 minutes of walking, heart rate and energy expenditure were significantly greater for ambulation with axillary crutches than with Ortho crutches (OCA). After 11.5 minutes of walking, no difference in energy cost was found between crutch types; however, heart rate increased significantly (p. 01) during ambulation with axillary crutches (ACA). Differences in energy cost and heart rate were attributed to increased upper extremity work performed when using axillary crutches. No significant differences in mean blood pressure were found between OCA and ACA. The results indicate that during NWB ambulation for short periods or over short distances, the Ortho crutch is less taxing in energy cost and heart rate demands.

Lois Howard +

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Ed Christman, ATC, MEd
Knoxville, Tennessee

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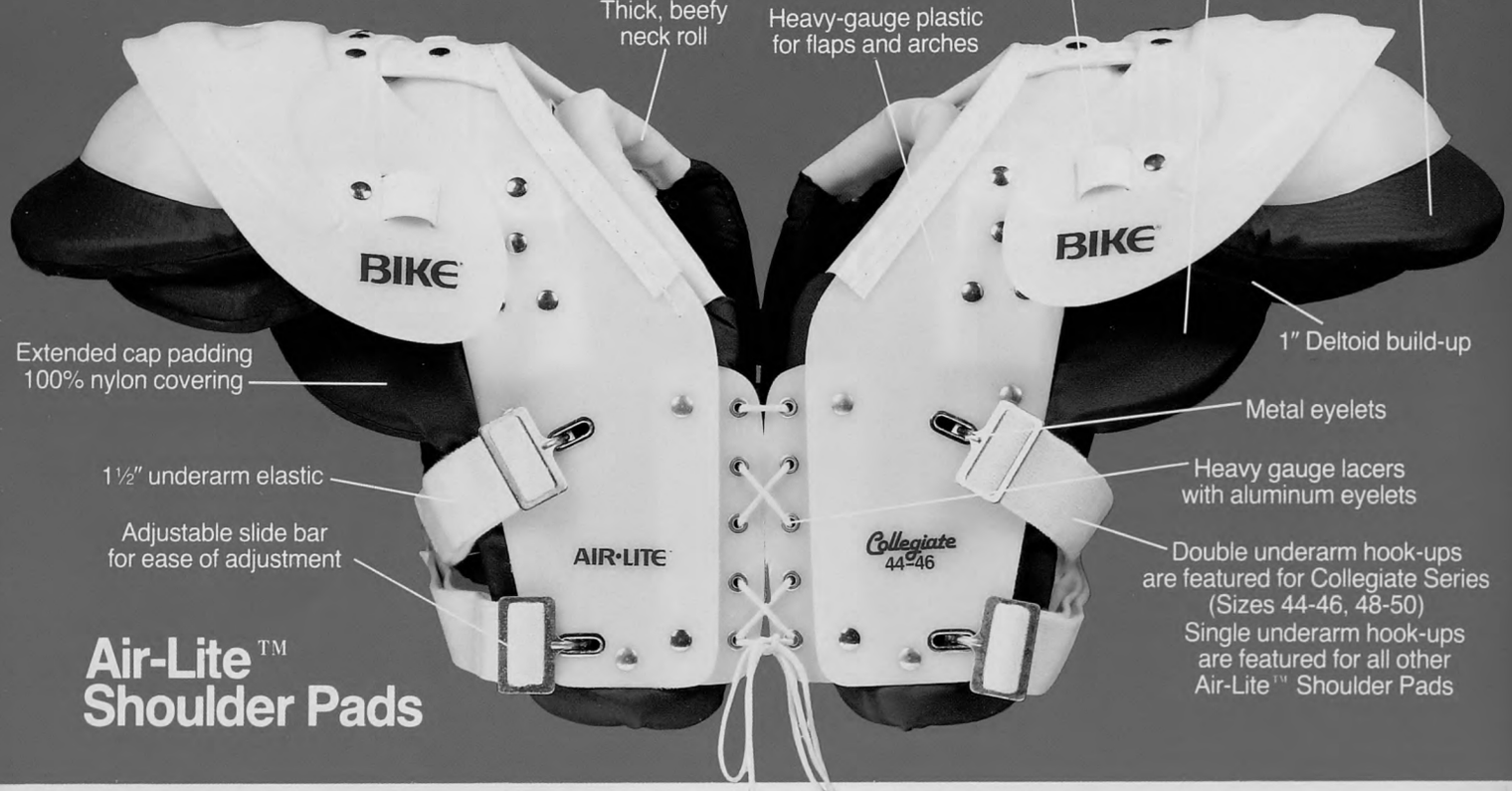

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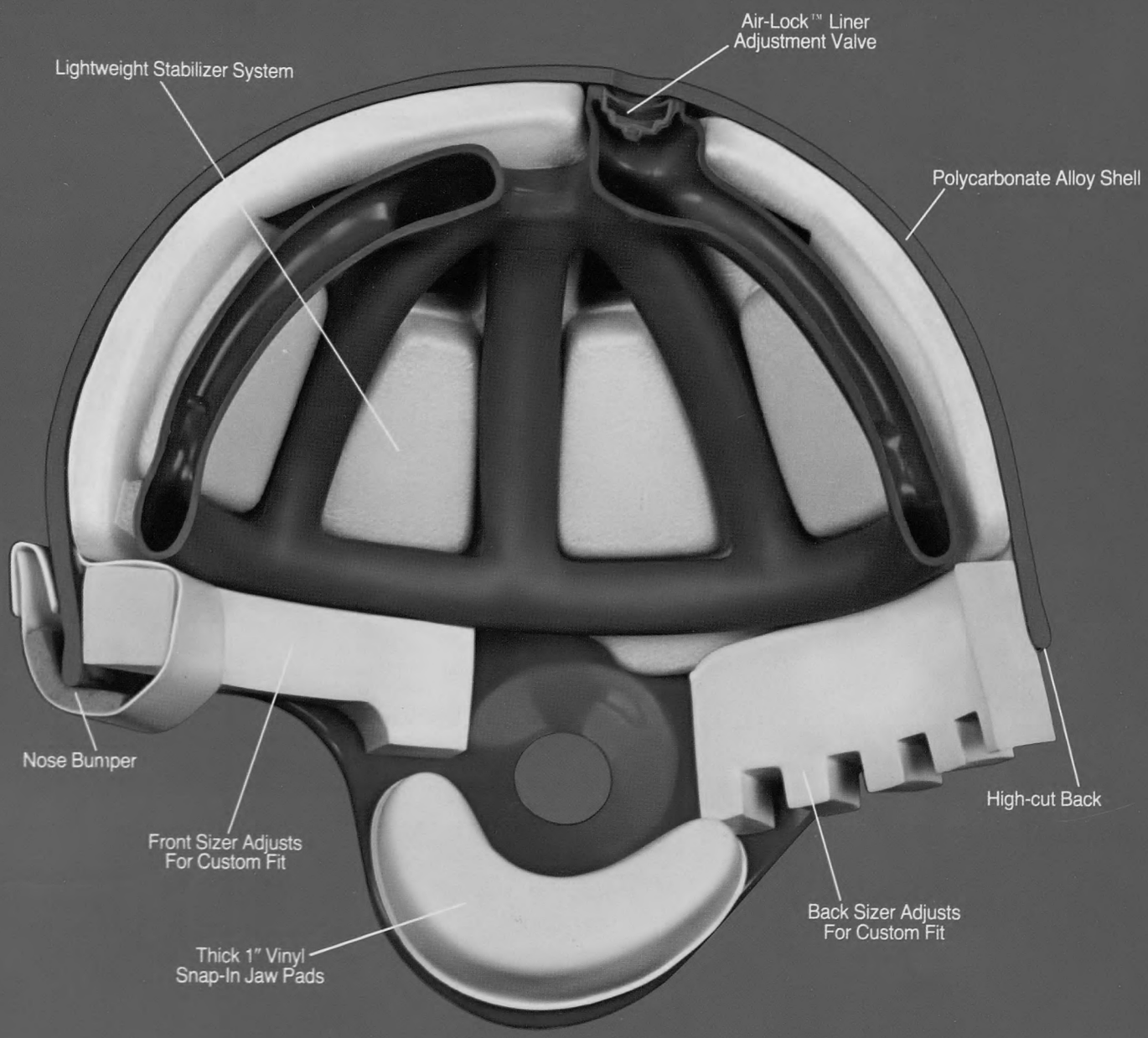

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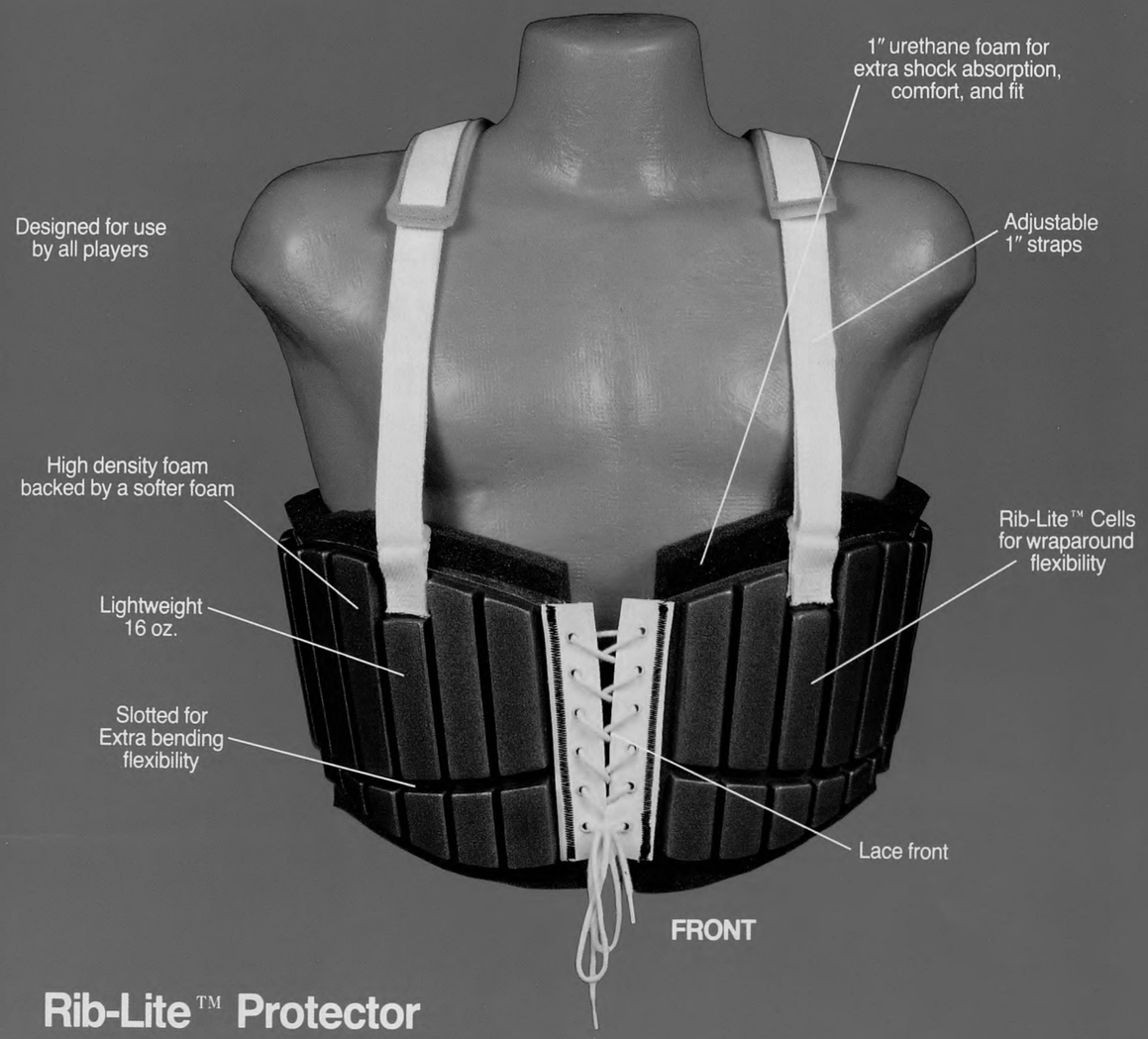

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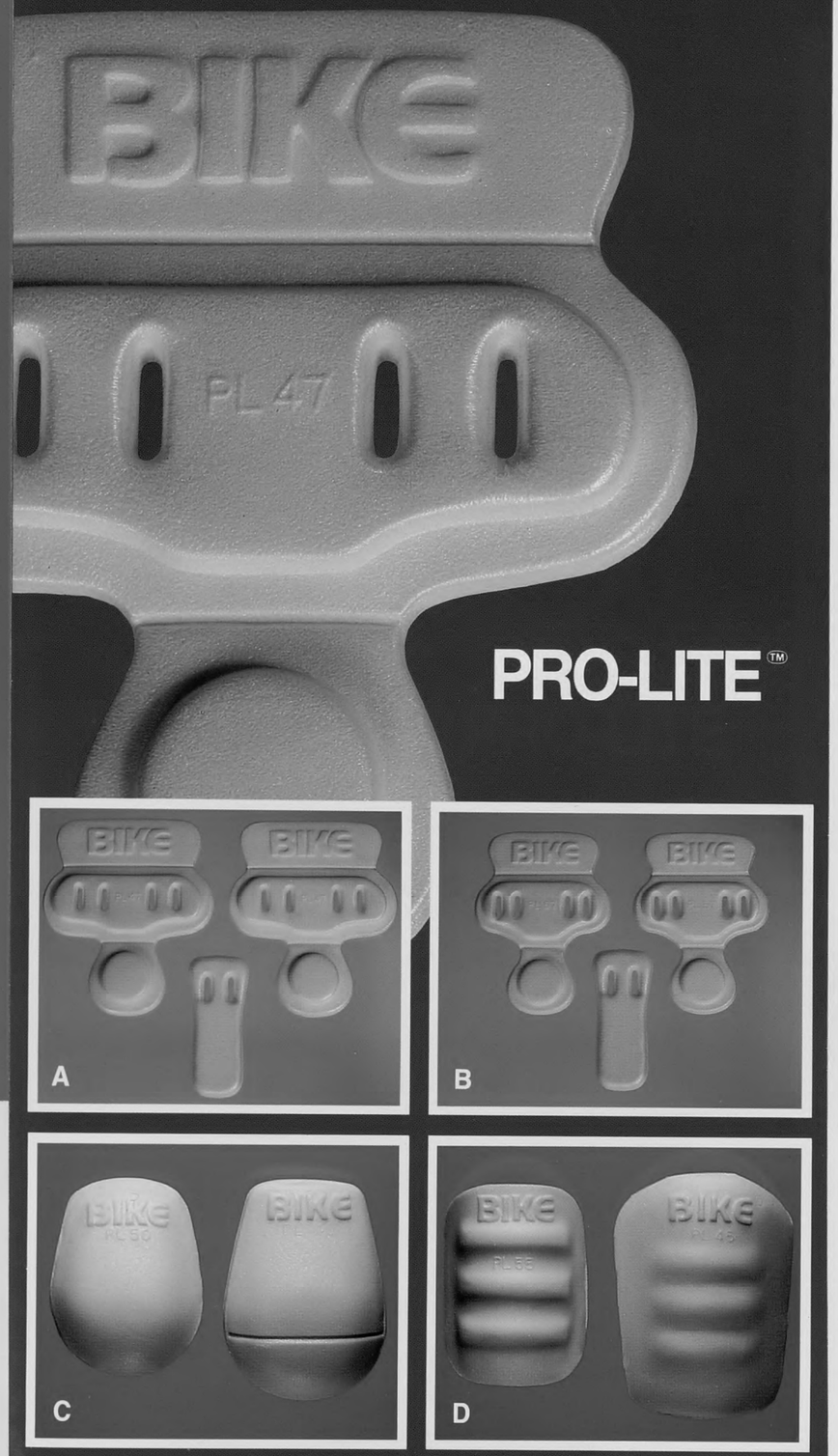

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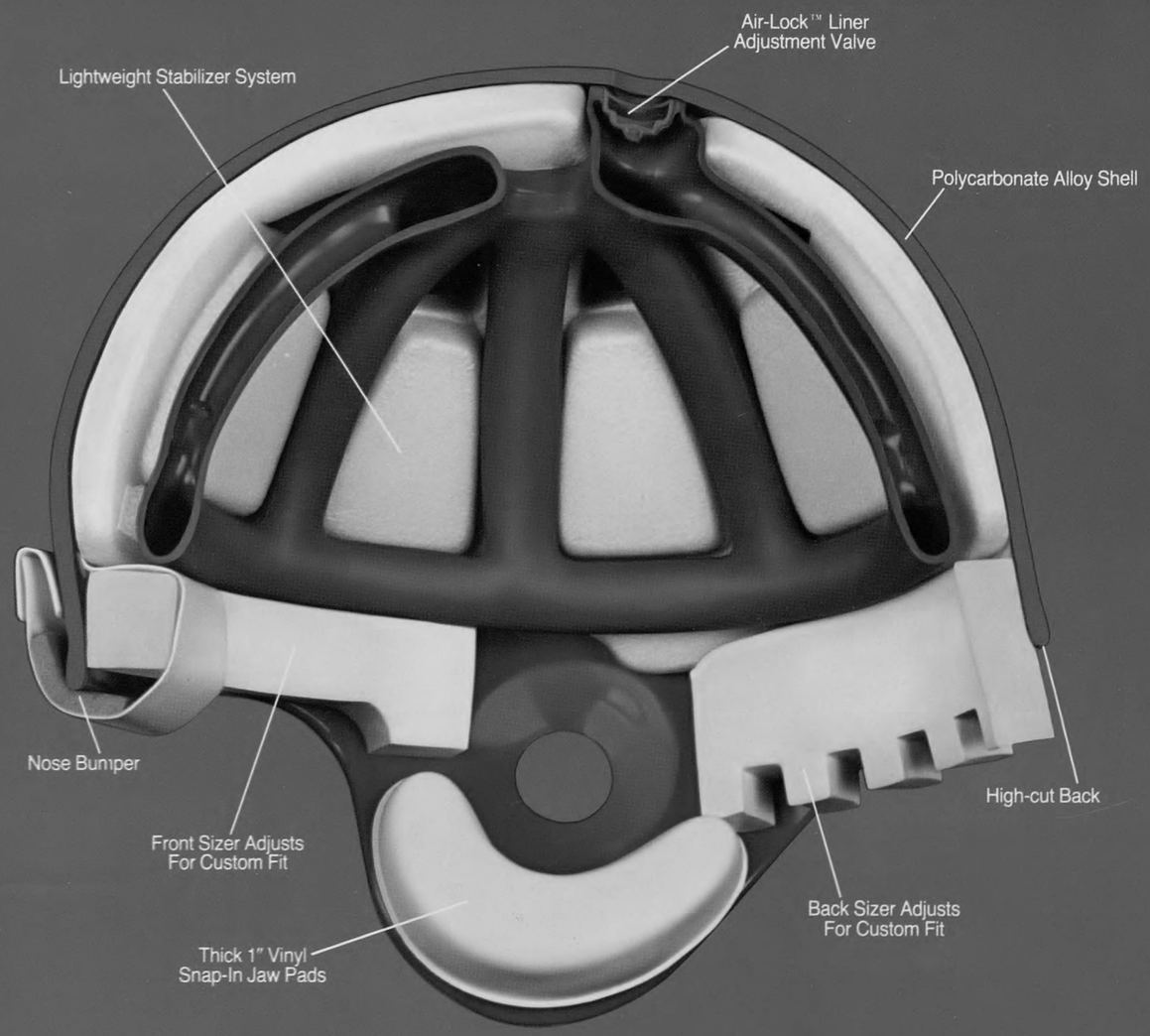

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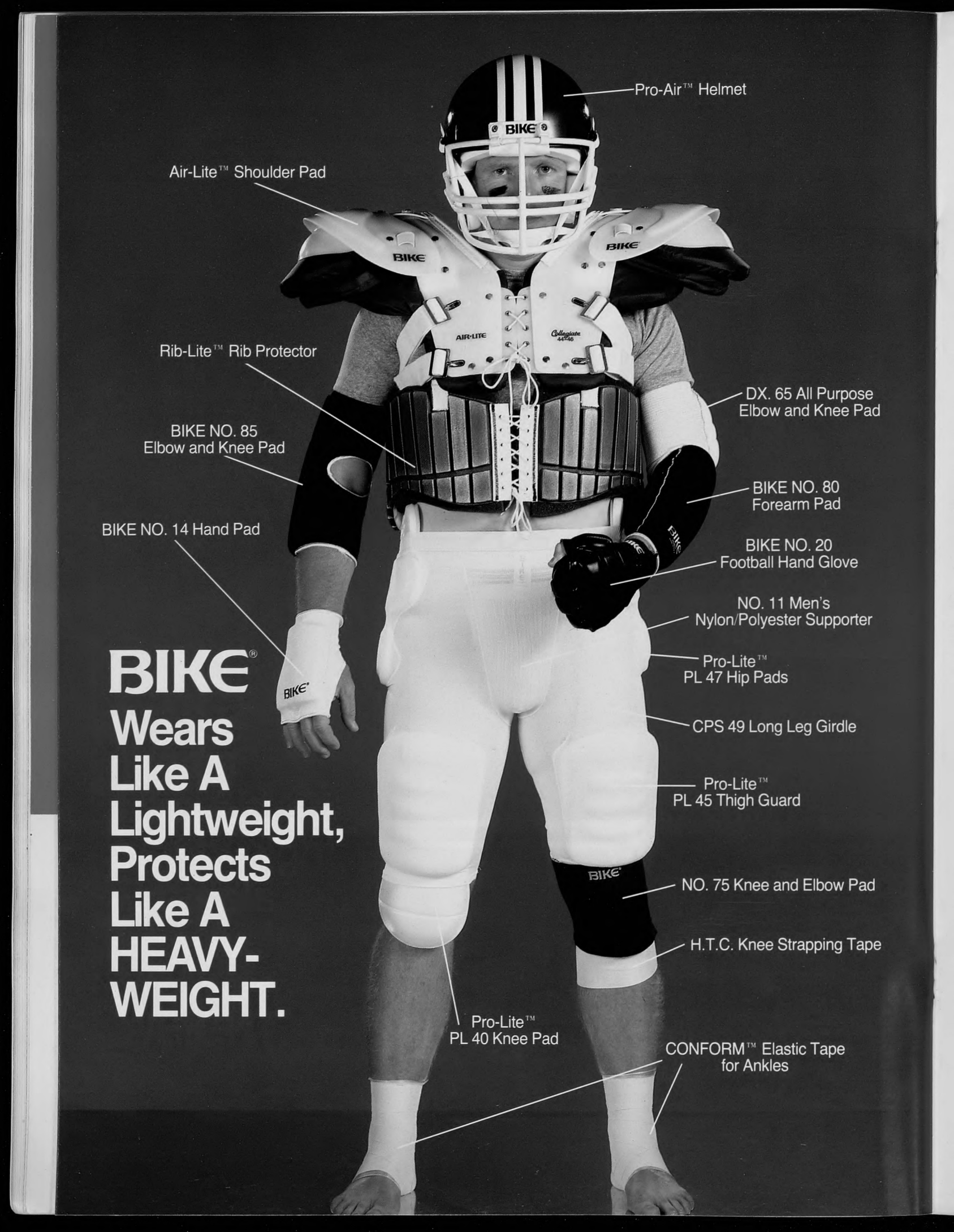
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Influence of Fluid Ingestion and Dehydration on Precision and Endurance Performance in Tennis

Edmund R. Burke, PhD
Bjorn Ekblom, MD

Introduction

Exercise dehydration, hyperthermia, and depletion of blood glucose and muscle glycogen stores has been shown to limit an individual's performance during prolonged exercise.[1,3,5,10,14] In addition, thermal dehydration has been shown to have delerious effects on physical working capacity,[4,11] but has varying effects on muscular endurance and strength [8] and anaerobic capacity.[8,11] Previous attempts to assess the influence of exercise and thermal dehydration and blood glucose levels during precision-endurance activities has not been systematically studied. A more complete understanding of the stresses imposed by these losses on skills performance is questionable. Consequently, the present study was conducted to determine the value of replacing fluid losses with a drink containing carbohydrates and electrolytes during two hours of simulated tournament tennis playing. This type of study should more closely approximate the relationship between carbohydrate availability, fluid balance and error in human performance.

Subjects and Methods

The subjects were 5 men (21-32 years) and 5 female (30-40 years) healthy and active tennis players. All were capable of reaching the quarter-finals of a local tournament and two of the males were club professionals. Each subject was fully informed of the risks and stresses associated with the experiments.

Each player was required to perform two hours of simulated tournament tennis conditions on separate days either with no fluids, a carbohydrate drink, or water. The games were played indoors (23 — 25°C) on an artifical playing surface. Thermal dehydration was performed in a sauna maintained at approximately 80°C. During thermal dehydration the subjects were instructed to lose approximately 1.5 kg of body weight. This is the approximate weight loss incurred in two hours of tennis without fluids. During one of the experimental conditions a control day was administered with the subjects sitting for two hours in a neutral environment. All trials were randomly assigned.

The frequency of all measurements before, during, and after the experimental treatments are shown in figure I. Blood samples were taken from the finger tip and analyzed for hematocrit, hemoglobin and glucose. Hematocrit ratio (Hct) was measured in triplicate with a microhematocrit centrifuge and corrected (0.96) for plasma trapped with the packed red cells. Hemoglobin (Hb) was measured by the cyanmethemoglobin method. Plasma glucose was anlayzed in duplicate, using a colorimetric method (Kabi Reagents, Stockholm, Sweden). The subjects were reminded every twenty minutes to drink ad libitium. Total amount drank in water and carbohydrate drink trials was recorded for each player. The carbohydrate drink contained 12 mEq Na^+, 2 mEq K^+, 12 mEq Cl^-, 0.7 mEq Phos, and 75 grams of carbohydrate polymer in each liter (Pripps Pluss; Pripps Inc. New York, NY). The temperature of the fluid ingested ranged from 9 to 12°C. Body weight was recorded pre and post exercise for all subjects.

A vertical jump (Sargent Jump Test) was used to measure power output in the players. Skill was assessed using a accuracy test as diagramed in figure II. Balls were fired at the players from the opposite side of the court using a Prince Ball Machine. A total of 50 balls were fired randomly (25 backhand, 25 forehand) at a slow speed; 20 balls/minute. The subject was instructed to return the balls cross court and aim for the center of the target zone. Each ball was recorded and scored as 3, 2, 1 points; balls hit outside the target zone were recorded as 0, and total number of balls hit into the net was noted. After a short rest period the same procedure was followed with 50 balls randomly fired at a faster speed; 35 balls/minute. Total number of points for the 100 balls served and total net shots were recorded. Before each skill session a 90 second warm-up period was allowed. Differences between the means of selected variables were tested for statistical significance with a paried t-test. Significance was set at the 0.05 level of significance.

Results and Discussion

In order to determine the unfluence of the five treatment trials upon the selected physiological indices and skill performance, two separate profiles were constructed: 1) the absolute changes in physiological and skill indices with each treatment in terms of magnitude of change (table I); 2) the relative changes in physiological and skill indices with each treatment, in terms of respective percentage change (△%) from values determined at pre-exercise. The pre-value for thermal dehydration is the mean of pre-value for the other four treatments.

Body weight changes were more pronounced in the no fluids (NF) and termal (T) dehydration conditions than in the other three trials; this was to be expected in view of the fact that no fluids were taken. A slight increase in body weight during the control (C) treatment is most likely due to the fact that water was allowed ad libitum during the two hours of sitting. The larger weight loss in the water (W) compared to the carbohydrate (CHO) trial may be partially attributed to the volume drank during the activitiy. A mean (± S.D.) of 736 ml (± 25) of CHO was consumed compared 505 ml (± 24) of W.

The decrease in hemoglobin (Hb) seen in all conditions except T, parallels the changes in hematocrit (Hct). The changes which occur seem to be different to what would be expected. There is a 2.5% decrease in Hct and an 1.6% increase in body weight in Condition C. Likewise, there is a 2.6% decrease in Hct in trial NF with the opposite effect of a decrease of 2.7% in body weight. While in both rehydration conditions (CHO & W) there is a decrease in Hct, hemodilution seems to be taking place in all forms of treatments except T. Intermittant exercise of this nature may not have the same deleterious effects on blood volume as continuous work[4,7].

The dynamics of water movement into or out of the vascular compartment during exercise are not clear[6]. Although

Dr. Burke is a Research scientist at the University of Iowa Hospitals, Cardiovascular Division, Department of Internal Medicine, University of Iowa Hospitals, Iowa City, Iowa 52242.
Dr. Ekblom is Associate Director of Physiology III at the Karolinska Institute, Stockholm, Sweden.

TABLE I

MEAN (± S.D.) ABSOLUTE AND RELATIVE CHANGES (%) IN PHYSIOLOGICAL AND SKILL INDICES WITH EACH TREATMENT

		Body Weight (kg)	Hb (Mg %)	HCT* (%)	Glucose (mM)	Sargent Jump (cm)	Total Points	Net Shots
Control	Pre	69.3 (11.6)	13.5 (1.4)	43.2 (3.4)	4.4 (0.5)	42.9 (16.8)	71.7 (15.3)	3.8 (3.1)
	Post	70.4 (11.5)	13.0 (1.4)	42.1 (2.7)	4.3 (0.4)	38.5 (11.9)	71.1 (22.5)	3.2 (2.4)
	Δ	+1.1	-0.5	-1.1	-0.1	-4.4	-0.6	-0.6
	% Change	+1.6	-3.7	-2.5	-2.3	-10.3	-0.8	-15.8
Pripps	Pre	69.3 (11.7)	13.9 (1.7)	43.6 (4.4)	4.5 (0.3)	37.1 (11.5)	69.7 (14.7)	3.7 (3.4)
	Post	69.0 (11.5)	13.1 (1.2)	41.9 (4.3)	4.9 (1.1)	41.5 (10.3)	69.0 (28.3)	2.9 (3.2)
	Δ	-0.3	-0.8	-1.7	+0.4	+4.4	-0.7	-0.8
	% Change	-0.4	-5.1	-3.0	+8.9	+11.6	-1.0	-21.6
Water	Pre	69.7 (11.9)	14.2 (1.5)	42.4 (2.7)	4.3(0.5)	39.5 (10.5)	74.8 (19.8)	2.9 (2.3)
	Post	68.9 (11.3)	13.4 (1.8)	42.2 (3.2)	3.8(0.6)	40.0 (10.5)	62.6 (13.9)	4.2 (3.6)
	Δ	-0.8	-0.8	-0.2	-0.5	+0.5	-12.2	+1.3
	% Change	-1.1	-5.6	-0.9	-11.6	+1.3	-16.3	+44.8
No Fluids	Pre	69.7 (11.9)	13.5 (1.3)	42.8 (3.8)	4.1 (0.5)	42.4 (12.1)	75.5 (19.4)	3.4 (2.3)
	Post	67.8 (11.8)	13.1 (1.4)	41.7 (4.6)	3.8 (0.4)	37.8 (10.5)	69.2 (8.7)	4.1 (2.1)
	Δ	-1.9	-0.4	-1.1	-0.3	-4.7	-6.3	+0.7
	% Change	-2.7	-3.0	-2.6	-7.3	-10.8	-8.3	+20.6
Thermal Dehydration	Pre	69.5 (0.2)	13.8 (0.3)	43.0 (0.5)	4.4 (0.1)	40.5 (2.7)	72.9 (2.7)	3.5 (0.4)
	Post	67.9 (11.6)	13.9 (1.1)	43.6 (4.3)	4.4 (0.6)	37.7 (9.8)	63.1 (21.7)	7.0 (5.6)
	Δ	-1.6	+0.1	+0.6	0	-2.8	-9.8	+3.5
	% Change	-2.3	+0.7	+1.4	0	-6.9	-13.4	+100

* Observed HCT x 0.96

TABLE II

MEAN POST EXERCISE VALUES (± S.D.) AND PERCENT CHANGES OF PRIPPS PLUSS VS. WATER FOR TENNIS SKILLS TEST, BLOOD VALUES, AND BODY WEIGHT

	Body Weight (kg)	Hb/MG %	HCT (%)	Blood Glucose (mM)	Total Points	Net Shots
Water	68.9 (11.3)	13.4 (1.8)	43.7 (3.2)	3.8 (.58)	62.6 (13.9)	4.2 (3.6)
Pripps Pluss	69.0 (11.5)	13.1 (1.2)	43.5 (4.3)	4.9 (1.12)	69.0 (28.3)	2.9 (3.2)
Δ	+ 0.1	- 0.2	- 0.2	+ 1.1*	+ 6.4*	- 1.3
% Change	0.1%	2.2%	0.5%	28.9%	10.2%	30%

* Significant $p < 0.05$

hemoconcentration has been reported during exercise[7], hemodilution has also been noted, and may be related to the form of exercise and state of hydration[12,13]. T dehydration resulted in an 0.7% and 1.4% increase in both Hb and Hct respectively. While the magnitude of these changes are not comparable to previous studies [4,11], there exhibted decreasing trends. However these changes are small and have no practical importance.

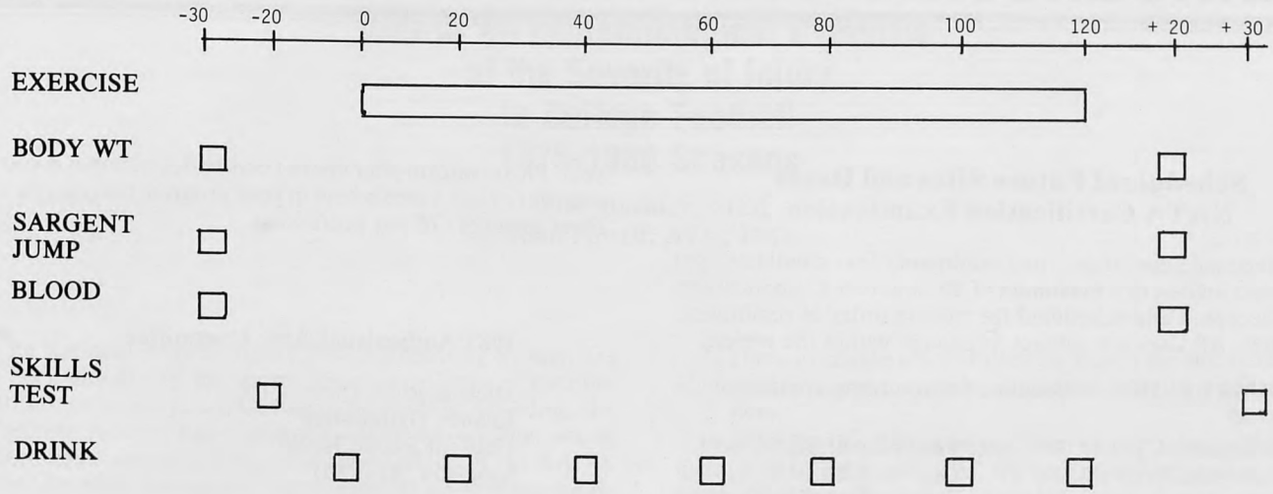
The changes in plasma glucose in both the C and T conditions over the two hour period is similar, with no significant differences observed. However the exercising trials showed pronounced differences. Playing with a carbohydrate drink there was an increase of 8.9% in plasma glucose, compared with a decrease of 11.6% and 7.3% in trials W and NF respectively. The relative plasma glucose response observed in terms of order of magnitude for trial CHO, demonstrated the effectiveness in terms of increasing plasma glucose levels. When a comparison is made between both post exercise values for treatments CHO and W we see there is a 28.9% increase in blood plasma with trial CHO (table II). This maintenance of plasma glucose and body weight during exercise may be one of the determinants for increased skill performance over W, NF and T after exercise. The findings related to the effects of the experimental formulation on plasma glucose levels confirm and support previous results concerning the efficiancy of fluid treatment with carbohydrates in maintaining performance [1,2,9,10,14].

In looking at table I, one should be careful in interpreting the results for total points and net shots. A decrease in total points can be interpreted as a decrease in skill and likewise an increase in net shots as a decrease in ones ability to hit the ball properly.

During C and CHO trials there is a slight decrease in total points compared to a 16.8% decrease with W. Similarly there was a decrease of 13.4% in T dehydration and 8.3% in the NF trials. Table II points to a significant increase of 10.2% in total points in the post-exercise trial for condition CHO over W. As seen in table II, conditions C and CHO faired more favorably than the other trials in the number of net shots. In this case, one must be careful in interpreting the data since as you see in condition T an increase of 3.5 shots into the net to 7 after dehydration, gives one a 100% increase.

Maintaining body weight and plasma glucose levels with a carbohydrate drink seems relevant in decreasing the amount of error and maintaining skills levels in athletic performance, as has been shown for endurance activities, suggests that carbohydrate availability in the form of a drink not only maintains plasma glucose for muscle metabolism, but may also maintain the metabolism of nerve cells and thus the integration controlling the contraction of skeletal muscle

FIGURE I
SCHEMATIC ILLUSTRATION OF EXERCISE AND TESTING SEQUENCE



over long periods of time[2].

In general, explosive power showed relatively no change (trial W) or decreasing trends (trial T, C, and NF) except for condition CHO with an increase of 11.6%. These results seem to correspond to the earlier results for total points and net shots. Maintaining power may result in balls being hit harder, and less shots hit into the net.

Summary

The results observed from the data collected during this field trial study indicate that a carbohydrate polymer drink will aid in the maintenance of body weight and maintain ones skill level after two hours of simulated tournment tennis conditions. The implication of this study becomes more apparent in view of the fact that many tennis players were unaware of the importance of fluid intake practices during practice or tournament condition. It may be concluded with a carbohydrate polymer drink can enhance performance over water or no fluids in tennis competition. These results, in conjunction with the data from earlier experiments, suggests that carbohydrate availability in extensive work tasks relates not only to liver and muscle glycogen stores, but to blood glucose for muscle metabolism and neural integration controlling the muscles in an endurance-skill task.

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TENNIS

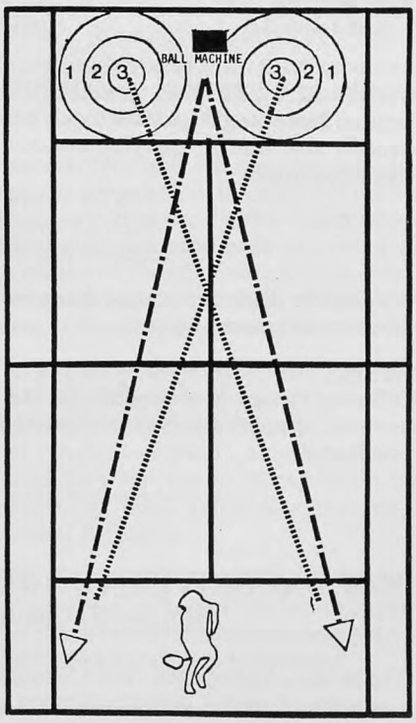


FIGURE II

Announcements

Schedule of Future Sites and Dates NATA Certification Examination

All regional sites subject to a **minimum** of six candidates per site and limited to a **maximum** of 30 candidates. Applications are accepted and scheduled for sites in order of remittance. NOTE: All sites are subject to change within the region.

JANUARY 9, 1983 — Deadline for returning applications is 11-27-82

New Britain, CT
Philadelphia, PA
Raleigh, NC
Chicago, IL
Dayton, OH
Fort Worth, TX
Denver, CO
Sacramento, CA
Portland, OR

March 20, 1983 — Deadline for returning applications is 2-5-83

Boston, MA
Pittsburgh, PA
Springfield, VA
Anderson, IN
Lincoln, NE
Fort Worth, TX
Tucson, AZ
Costa Mesa, CA
Richmond, KY
Boise, ID

June 26, 1983 — Deadline for returning applications is 5-21-83

New Britain, CT
Philadelphia, PA
Raleigh, NC
East Lansing, MI
Lawrence, KS
Denver, CO
Sacramento, CA
Richmond, KY
Portland, OR

July 31, 1983 — Deadline for returning applications is 6-18-83

Boston, MA
Philadelphia, PA
East Lansing, MI
Cedar Falls, IA
Costa Mesa, CA
Chattanooga, TN
Seattle, WA
Raleigh, NC

WHEN REQUESTING AN APPLICATION: It must be in written form, it must state the date to be examined and what section you will be applying under. Application forms are available from:

NATA Board of Certification
P.O. Drawer 1865
Greenville, NC 27834

NOTE: The 1984 examination dates will approximate the 1983 dates on a regional basis.

All items must be received by the NATA Board of Certification Office by the specified deadline for the date you have chosen; however, all applications are accepted and scheduled in order of remittance.

NATA AUDIOVISUAL AIDS COMMITTEE
John Streif, Chairman

The NATA Audiovisual Aids Committee will revise the bibliography of media items available to our membership this year. Please inform your district committee member if you are aware of or use a media item in your program that may benefit other members of our profession.

1982 Audiovisual Aids Committee

Michael Rule, District 1
Keaney Gymnasium
Univ. of Rhode Island
Kingston, RI 02881

G. Patrick Connors, District 2
Program Director
The Institute for Medicine in Sports
Hamilton Hospital
Box H
Trenton, NJ 08690

John Joseph Kasik, District 3
9005 Harford Rd
Baltimore, MD 21234

Robert S. Gray, Jr., District 4
525 East Market St
Akron, OH 44309

Jerry Nowesnick, District 4
College of Du Page
22nd St & Lambert Rd
Glen Ellyn, IL 60137

Jerry Weber, District 5
Dept. of Athletics
Stadium Office Building
University of Nebraska
Lincoln, NE 68588

Allen Eggert, District 6
Rice University
Houston, TX 77002

Thomas E. Abdenour, District 7
Head Athl. Trainer
Weber State College
Ogden, UT 84408

Robert E. Smetanka, District 8
1327 31st Ave
Apt. #3
San Francisco, CA 94122

James A. Madaleno, District 9
Valdosta State College
Athletic Dept
Valdosta, GA 31698

Dennis T. Murphy
University of Montana
Field House 208
Missoula, MT 59801

John Streif, Chairman
University of Iowa
FH Training Room
Iowa City, IA 5224

Continued on page 314

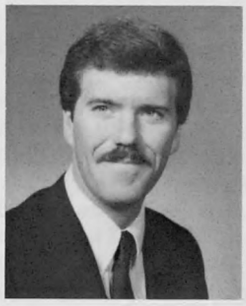
NAIRS An Epidemiological Overview of the Severity of Injury in College Football 1975-1980 Seasons

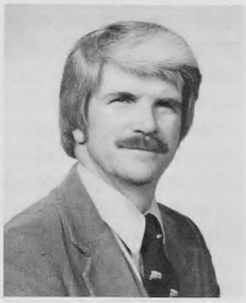
W.E. Buckley, MEd
John Powell, ATC, PhD

The National Athletic Injury/Illness Reporting System has been monitoring the sports injury experience of member institutions for six years. During these years of recording, the collection process has continued under a consistent set of recording parameters. The professional efforts of the NAIRS recorders have developed a large data set concerning sport-related injuries for a variety of men's and women's sports at both the high school and college levels. College football has characteristically accounted for the largest single sport participation within the system. It is college football that provides the NAIRS data base with the largest amount of injury as well as the greatest amount of opportunity to be injured.

The NAIRS program has a design based on the principles of epidemiological research. That is to record a variety of variables associated with an occurrance, and then search for patterns of variables which are most closely associated with specific occurrances. One of the basic objectives associated with interpreting data from epidemiological models is to establish the consistency of the data. When statistically representative populations are not available this is best accomplished by applying the recording device over a period of time. In this way minor upward and downward fluctuations in individual injury rates and the addition and deletion of recording teams among successive seasons can be taken into account when the persistency of emerging patterns is tested. By establishing a persistent baseline of information using an epidemiological data base, it becomes possible for decision makers to:

1. Determine the injury patterns that exist for the sport/game as it is presently designed; i.e. the ability to make judgements relative to the risk of participation.
2. Select appropriate intervention plans for problem areas (teaching techniques, rules, equipment).





Mr. Buckley is currently employed at the Pennsylvania State University in the department of Health Education and is working towards a doctorate in that discipline. Dr. Powell is now an assistant professor and Director of the Athletic Training Program at Penn State. He is currently the trainer for the Penn State Soccer and Lady Lion Basketball teams and Special Projects Director for the National Athletic Injury/Illness Reporting System (NAIRS). He also serves as Chairman of the Research and Injury Committee for the National Athletic Trainers Association.

3. Have available a set of data by which the utility of the program changes can be evaluated as to their effectiveness.

In order for the data obtained from epidemiological investigation to be most effective, the recording instrument must be based on specific definitions in key areas. It is also important that the recorder be made aware of these definitions prior to recording incidents which occur.

Injury Definitions

NAIRS uses definitions for reportable injuries which were developed through discussion with a variety of professionals in the area of sports safety. These definitions have been used since 1974 by all members of the system.

1. REPORTABLE INJURY/ILLNESS: Injuries and illnesses meeting **any** of the following definitions are reportable. This means that a case report must be filed. These definitions are meant to separate the nuisance injuries which warrant little attention and do not materially affect performance from the health problems which have potential or demonstrated significance.
   a) Any **brain concussion** is reportable if it causes cessation of the athlete's participation for observation before return to play is permitted.
   b) Any **dental injury** which **should** receive professional attention is reportable.
   c) Any injury/illness is reportable if it causes cessation of an athlete's customary participation throughout the participation-day **following day of onset.**
   d) Any injury/illness is reportable if it requires substantive professional attention before the athlete's return to participation is permitted (i.e., **without such attention, the athlete would not have been** permitted to return to participation on the next participation-day). NOTE: **Any program has the privilege of reporting any injury/illness** under liberal interpretation of this definition.
2. PARTICIPANT (ATHLETE): An "athlete" is defined by the type of program in which the patient was involved when stricken. For NAIRS — I and II, an athlete is one who maintains candidacy for varsity competition by subscribing regularly to the team's eligibility rules, procedures and scheduled activities.
3. PARTICIPATION (RETURN TO PARTICIPATION): An athlete is "participating" if he/she has health supervisory clearance **or** coach permission to engage in activities generally expected of his or her teammates.
4. PRACTICE (PARTICIPATION-DAY): Only those

coach-directed sessions which include supervised physical activity are recordable as practices.

Severity Classification

In addition to the importance of establishing consistant definitions for the reportable event, specific definitions for use in data interpretation must be established. Two important areas in epidemiological investigation are severity, the relative impact that the injury has on the player, and exposure, the amount of opportunity for injury which exists.

The significance of an injury can be interpreted in a variety of different ways. Standard medical significance generally depends on the amount of pathology evident at the injury site as it has been established by a medical doctor. NAIRS utilizes a more functional orientation time-loss from participation from the sport. This approach best utilizes the information which is most readily available to the recorder and can provide a more accurate perspective on the relative importance of injury to the individual and his team. It should be noted that within the NAIRS data set, clinical information is also recorded for each episode of injury as it is available from the medical community. The following degrees of severity (time-loss) are used by NAIRS to provide for optimal clarity for the interpretation of the epidemiological data being collected.

Minor. The distinction between a MINOR and a SIGNIFICANT injury is the most pivotal of the premises adopted in NAIRS. A MINOR injury constitutes a reportable injury/illness which did not prevent the athlete from returning to effective participation within one week from the day of onset. For routine reports regarding the incidence and prevalence of sports injuries, MINOR injuries will be excluded. Such problems do not reflect meaningfully on the calculated risk of football participation. For analytic purposes, the reportable injury/illness proving to be of only MINOR significance remains in the data bank for ad hoc reference and for use if that injury recurs or is followed by a significant complication.

Significant. Injuries/illnesses which exceed the criterion of MINOR become SIGNIFICANT events. SIGNIFICANT injuries include all traumata with time loss greater than seven days. An exception is made for dental injuries which may not cause absence for a week. Any dental injury which is MINOR in terms of lost time is computer-converted to SIGNIFICANT. Within the SIGNIFICANT category, injuries permitting the athlete to return to participation within eight to twenty-one days are termed MODERATE. Inability to return to participation within 21 days from onset is the criterion used by NAIRS for assigning MAJOR status to a health problem. This recognizes that any problem which prevents a highly motivated participant from being active in his sport for at least three weeks, regardless of mode of treatment, is a MAJOR problem.

Severe. To avoid overinterpretation of the word MAJOR by those reviewing data reports, a fourth severity classification, SEVERE, is used for the type of permanently disabling injury of societal significance (e.g., death, quadriplegia, amputation or brain damage).

Athlete Exposure

For epidemiological purposes, it is necessary to express frequencies of injury as they relate to the amount of exposure to the sport. Rates, as they are called, refer to the number of cases experienced in a group of individuals at risk. In the NAIRS data set, an athlete-exposure is each opportunity for an athlete to get hurt (e.g., 50 athletes at 5 practices equal 250 injury opportunities or 250 athlete-exposures). This concept provides the appropriate perspective for evaluating injuries. It takes into account the number of injuries that **did** occur in relation to the number of times an injury **could have** occurred. By using rates of injury generated in this manner, it is then possible to compare injury experiences among various data subsets.

Presentation of Data

Table I describes basic exposure information regarding the college football population that participated in the NAIRS service. The information is presented by season and includes the 1975 fall season through the 1980 fall season. The table demonstrates a variation in total participating teams. At the end of the six year period, 309 teams were monitored. The number of individual athletes monitored was 28,419 and these athletes accounted for almost 2.5 million opportunities for injury. The individual season information is presented under the appropriate season heading and were used to generate the specific injury rates per 100 athletes and per 1000 athlete-exposures for the remainder of the tables.

TABLE I

N.A.I.R.S. Participant and Exposure to Risk of Injury For College Football 1975-1980

Season	75	76	77	78	79	80	TOTAL
# Teams	42	37	69	47	57	57	309
# Athletes	3738	3330	6348	4230	5358	5415	28,419
# Athlete-Exposures	310,286	275,502	531,798	368,558	479,567	484,281	2,449,992

Tables II-V display data for each of the NAIRS severity categories that have been previously described. An exception is the **severe** category, which is not included. The extremely low incidence within this severity category, and the societal implications associated with this group, warrant more specific evaluation. Within the general scope of this discussion, the eight body part categories are the same as those that are used routinely by NAIRS for distribution to member institutions. The **miscellaneous** category includes all injuries/illnesses, that cannot be directly and exclusively accomodated by the other categories.

The data in these tables are displayed as a frequency of injury; an injury case rate per 100 athletes; and an injury case rate per 1000 athlete-exposures. The frequency raw data are presented as a point of interest but have little value in any comparative exercise. The two case rates can be used with confidence for interpretation of data among body categories or across years. These particular case rates include multiple cases for some athletes and should not be confused with the number of individual athletes who were injured.

Table II presents the injury experience of member institutions that have been categorized as demonstrating MINOR severity. It is noted that the highest case rate per 100 athletes was the hip/leg category with 13.5. Further, the three highest body part categories for case rate per 100 athletes and case rate per 1000 athlete-exposures were hip/leg, ankle/foot, and knee.

The data on MINOR cases can be used as an indicator of injury patterns that must be dealt with on a daily basis. It provides the sport health care specialists with information that will help them deal effectively with injuries seemingly inherent in the game of football. For example, based on Table II, the injury rates for lower limbs can be identified as an area that should be looked at more closely. Based on this cursory investigation, the sport health care specialist should be able to offer or suggest some type of an effective, preventive training or conditioning protocol.

Table III presents data on injuries that restricted athletic participation for more than seven days. Perusal of the TOTAL column demonstrated that the breakdown of these significant injuries by body part category are similar to that of the MINOR cases of injury experience. That is, the body categories of the lower limbs maintain a higher case rate than the other body part categories. There is a noted difference,

TABLE II

Relative Frequency of Minor Injuries
by Body Category for College Football
1975-1980 (NAIRS I & II)

	75	76	77	78	79	80	Total
HEAD/NECK/SPINE							
N	350	315	588	419	491	399	2562
CR/100 Ath	9.4	9.5	9.3	9.9	9.2	7.3	9.0
CR/1000 Ath-Ex	1.1	1.1	1.1	1.1	1.0	0.8	1.0
FACE/SCALP							
N	75	72	113	82	82	88	512
CR/100 Ath	2.0	2.2	1.8	1.9	1.5	1.6	1.8
CR/1000 Ath-Ex	0.2	0.3	0.2	0.2	0.2	0.2	
SHOULDER/ARM							
N	278	266	472	289	377	395	2077
CR/100 Ath	7.4	8.0	7.4	6.8	7.0	7.2	7.3
CR/1000 Ath-Ex	0.9	1.0	0.9	0.8	0.8	0.8	0.8
FOREARM/HAND							
N	294	215	417	246	306	305	1783
CR/100 Ath	8.0	6.5	6.6	5.8	5.7	5.6	6.3
CR/1000 Ath-Ex	1.0	0.8	0.8	0.7	0.6	0.6	0.7
TORSO							
N	220	158	368	204	302	267	1519
CR/100 Ath	6.0	4.7	5.8	4.8	5.6	4.9	5.3
CR/1000 Ath-Ex	0.7	0.6	0.7	0.6	0.6	0.6	0.6
HIP/LEG							
N	558	477	868	542	678	726	3849
CR/100 Ath	15.0	14.3	13.7	12.8	12.6	13.4	13.5
CR/1000 Ath-Ex	1.8	1.7	1.6	1.5	1.4	1.5	1.6
KNEE							
N	385	338	649	431	509	473	2785
CR/100 Ath	10.3	10.2	10.2	10.2	9.5	8.7	9.8
CR/1000 Ath-Ex	1.2	1.2	1.2	1.2	·1.1	1.0	1.1
ANKLE/FOOT							
N	478	434	768	509	604	665	3458
CR/1000 Ath	12.8	13.0	12.1	12.0	11.3	12.3	12.1
CR/1000 Ath-Ex	1.5	1.6	1.4	1.4	1.3	1.4	1.4
MISC							
N	63	35	105	80	80	89	452
CR/100 Ath	1.7	1.1	1.7	1.9	1.5	1.6	1.6
CR/1000 Ath-Ex	0.2	0.1	0.2	0.2	0.2	0.2	0.2

CR/100 Ath = Case Rate per 100 Athletes
CR/1000 AE = Case Rate per 1000 Athlete Exposures

TABLE III

Relative Frequency of Significant Injuries
by Body Category for College Football
1975-1980 (NAIRS I & II)

	75	76	77	78	79	80	Total
HEAD/NECK/SPINE							
N	58	54	102	75	99	88	476
CR/100 Ath	1.6	1.6	1.6	1.8	1.8	1.6	1.7
CR/1000 Ath-Ex	0.2	0.2	0.2	0.2	0.2	0.2	0.2
FACE/SCALP							
N	21	22	43	24	28	29	167
CR/100 Ath	0.6	0.7	0.7	0.6	0.5	0.5	0.6
CR/1000 Ath-Ex	0.1	0.1	0.1	0.1	0.1	0.1	0.1
SHOULDER/ARM							
N	122	89	203	123	154	164	855
CR/100 Ath	3.3	2.7	3.2	2.9	2.9	3.0	3.0
CR/1000 Ath-Ex	0.4	0.3	0.4	0.3	0.3	0.3	0.3
FOREARM/HAND							
N	71	73	118	79	83	92	515
CR/100 Ath	1.9	2.2	1.9	1.9	1.6	1.7	1.8
CR/1000 Ath-Ex	0.2	0.3	0.2	0.2	0.2	0.2	0.2
TORSO							
N	61	38	93	53	61	71	377
CR/100 Ath	1.6	1.1	1.5	1.3	1.1	1.3	1.3
CR/1000 Ath-Ex	0.2	0.1	0.2	0.1	0.1	0.1	0.2
HIP/LEG							
N	143	124	212	128	191	172	970
CR/100 Ath	3.8	3.7	3.3	3.0	3.6	3.1	3.4
CR/1000 Ath-Ex	0.5	0.5	0.4	0.3	0.4	0.4	0.4
KNEE							
N	325	284	556	398	418	463	2444
CR/100 Ath	8.7	8.5	8.8	9.4	7.8	8.5	8.6
CR/1000 Ath-Ex	1.1	1.0	1.1	1.1	0.9	1.0	1.0
ANKLE/FOOT							
N	190	168	286	189	265	272	1370
CR/100 Ath	5.1	5.1	4.5	4.5	5.0	5.0	4.8
CR/1000 Ath-Ex	0.6	0.6	0.5	0.5	0.6	0.6	0.6
MISC							
N	2	2	7	7	2	2	22
CR/100 Ath	0.0	0.1	0.1	0.2	0.0	0.0	0.1
CR/1000 Ath-Ex	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CR/100 Ath = Case Rate per 100 Athletes
CR/1000 AE = Case Rate per 1000 Athlete exposures

however, among the three highest categories. In Table III, the knee has the highest of SIGNIFICANT injury rate compared to Table II which places the knee as the third highest for MINOR insult. In other words, when a knee is injured it has a greater risk of restricting the athlete for more than seven days.

Tables IV and V demonstrate the injury experience that resulted in MODERATE and MAJOR injuries. These two tables are the component parts of the SIGNIFICANT Table III. They can be used to evaluate the SIGNIFICANT injuries in more detail. It is noted that the same relationships between body part categories and injury rates are evident. For example, according to Table IV, the total rates of injury for the three lower extremity body categories are very similar. The knee (3.7 per 100Ath) and ankle (3.4 per 100Ath) are very close and the hip/leg rate (2.4 per 100Ath) indicates a difference of about one less injury per 100 athletes. By contrast, the MAJOR injuries in Table V indicates a greater difference in the rates among the lower extremities with the knee at the highest level of risk.

Discussion

It is apparent that the case rates developed demonstrate persistence on a year-to year basis. That is, even with yearly fluctuations of frequency counts and population size, the case rates for each body category are similar. In fact, an analysis of variance across years and among body categories demonstrates no statistically significant variation.

The value of the data lies in the development of persistent trend lines. Without this initial trend line analysis, decision makers would necessarily rely on an arbitrary set of standards in determining acceptable levels of risk. Continual monitoring of the injury patterns provide the most objective tool to assist these decision makers in this task. Also, such trend line analysis can be used to evaluate the value of any intervention protocol. This can occur at two levels. The SIGNIFICANT injury rates could be used within the frame work of the characteristics that impact on the total sport experience. League officials, coaches, and game officials would necessarily be very concerned about the impact that SIGNIFICANT injuries would have on the benefits and image of the sport. They would naturally seek to understand the mechanisms of injury and game characteristics that may be associated with the sport injury experience. Only then could they realistically quantify the level of risk associated with the sport and determine whether or not it is an acceptable level.

The MINOR injury rates indicate the relative impact of injuries on the individual player or team. Once problem areas are identified, specific intervention can be instituted on an individual or team basis in an effort to cut down this nuisance type of injury experience.

TABLE IV

Relative Frequency of Moderate Injuries
by Body Category for College Football
1975-1980 (NAIRS I & II)

	75	76	77	78	79	80	Total
HEAD/NECK/SPINE							
N	30	37	68	43	61	55	294
CR/100 Ath	0.8	1.1	1.1	1.0	1.1	1.0	1.0
CR/1000 Ath-Ex	0.1	0.1	0.1	0.1	0.1	0.1	0.1
FACE/SCALP							
N	14	18	29	21	21	29	132
CR/100 Ath	0.4	0.5	0.5	0.5	0.4	0.5	0.5
CR/1000 Ath-Ex	0.1	0.1	0.1	0.1	0.0	0.0	0.0
SHOULDER/ARM							
N	74	58	127	77	82	98	516
CR/100 Ath	2.0	1.7	2.0	1.8	1.5	1.8	1.8
CR/1000 Ath-Ex	0.2	0.2	0.2	0.2	0.2	0.2	0.2
FOREARM/HAND							
N	24	28	49	30	37	45	213
CR/100 Ath	0.6	0.8	0.8	0.7	0.7	0.8	0.7
CR/1000 Ath-Ex	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TORSO							
N	38	29	64	40	44	45	260
CR/100 Ath	1.0	0.9	1.0	0.9	0.8	0.8	0.9
CR/1000 Ath-Ex	0.1	0.1	0.1	0.1	0.1	0.1	0.1
HIP/LEG							
N	105	89	149	82	140	112	677
CR/100 Ath	3.0	2.7	2.3	1.9	2.6	2.1	2.4
CR/1000 Ath-Ex	0.3	0.3	0.3	0.2	0.3	0.2	0.3
KNEE							
N	147	140	248	156	179	179	1049
CR/100 Ath	4.0	4.2	4.0	3.7	3.3	3.3	3.7
CR/1000 Ath-Ex	0.5	0.5	0.5	0.4	0.4	0.4	0.4
ANKLE/FOOT							
N	132	120	203	132	183	194	964
CR/100 Ath	3.5	3.6	3.2	3.1	3.4	3.6	3.4
CR/1000 Ath-Ex	0.4	0.4	0.4	0.4	0.4	0.4	0.4
MISC							
N	2	1	2	5	-	-	10
CR/100 Ath	0.1	0.1	0.0	0.1	-	-	0.0
CR/1000 Ath-Ex	0.0	0.0	0.0	0.0	-	-	0.0

CR/100 Ath = Case Rate per 100 Athletes
CR/1000 AE = Case Rate per 1000 Athlete Exposures

TABLE V

Relative Frequency of Major Injuries
by Body Category for College Football
1975-1980 (NAIRS I & II)

	75	76	77	78	79	80	Total
HEAD/NECK/SPINE							
N	28	17	34	32	38	33	182
CR/100 Ath	0.7	0.5	0.5	0.8	0.7	0.6	0.6
CR/1000 Ath-Ex	0.1	0.1	0.1	0.1	0.1	0.1	0.1
FACE/SCALP							
N	7	4	14	3	7	3	38
CR/100 Ath	0.2	0.1	0.2	0.1	0.1	0.0	0.1
CR/1000 Ath-Ex	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SHOULDER/ARM							
N	48	31	76	46	72	66	339
CR/100 Ath	1.3	0.9	1.2	1.1	1.3	1.2	1.2
CR/1000 Ath-Ex	0.2	0.1	0.1	0.1	0.2	0.1	0.1
FOREARM/HAND							
N	46	45	69	49	46	47	302
CR/100 Ath	1.2	1.4	1.1	1.2	0.9	0.9	1.1
CR/1000 Ath-Ex	0.2	0.2	0.1	0.1	0.1	0.1	0.1
TORSO							
N	23	9	29	13	17	26	117
CR/100 Ath	0.6	0.3	0.5	0.3	0.3	0.5	0.4
CR/1000 Ath-Ex	0.1	0.0	0.1	0.0	0.0	0.0	0.0
HIP/LEG							
N	38	35	63	46	51	60	293
CR/100 Ath	1.0	1.1	1.0	1.1	1.0	1.1	1.0
CR/1000 Ath-Ex	0.1	0.1	0.1	0.1	0.1	0.1	0.1
KNEE							
N	178	144	308	242	239	284	1395
CR/100 Ath	5.0	4.3	4.9	5.7	4.5	5.2	4.9
CR/1000 Ath-Ex	0.6	0.5	0.6	0.7	0.5	0.6	0.6
ANKLE/FOOT							
N	58	48	83	57	82	78	406
CR/100 Ath	1.6	1.4	1.3	1.3	1.5	1.4	1.4
CR/1000 Ath-Ex	0.2	0.2	0.2	0.2	0.2	0.2	0.2
MISC							
N	-	1	5	2	2	2	12
CR/100 Ath	-	0.1	0.1	0.0	0.0	0.0	0.0
CR/1000 Ath-Ex	-	0.0	0.0	0.0	0.0	0.0	0.0

CR/100 Ath = Case Rate per 100 Athletes
CR/1000 AE = Case Rate per 1000 Athletes Exposures

Conclusion

As previously mentioned, and reiterated here, this type of cursory evaluation is most important when identifying areas of concern. It should not, however, be the terminal effort in providing an analysis of sport risk. Rather, it is a strong base on which legitimate decisions can begin to be made concerning sport health care. As an on-going tool for continuous monitoring of the sport injury experience its value is both multiplicative and expedient. That is, any interventions that are appropriate and efficient can be more effectively implemented and evaluated. To that end, NAIRS continues its efforts and applauds the efforts of member institutions. +

Exercise Prescription and Therapeutic Rehabilitation in Sportsmedicine

Darcy P. Holland, ATC, MA

Introduction

In its infancy, athletic training focused largely on taping skills and patching techniques. Today however, although there are still some who advocate "tape at all costs", most athletic trainers realize the value of concentrating their efforts on preventive conditioning and rehabilitation techniques in order to reduce the use of tape, minimize tape-dependence, and above all help prevent reinjury. As Allman has pointed out, "In spite of the importance of adequate rehabilitation many athletes either are never rehabilitated or are inadequately rehabilitated. Numerous studies have indicated that this inadequacy of rehabilitation is most certain to result in a very high incidence of reinjury and an unnecessary restriction of future participation by the athlete."[1]

Exercise is an effective mode of therapeutic rehabilitation popular among sportsmedicine therapists today. Its popularity has even recently spurred the advent of a new field in education, that of the exercise specialist. Physicians and orthopaedic surgeons are "prescribing" exercise more readily and often assume that athletic trainers and therapists know exactly what exercises should be performed for each rehabilitative program. It is the job of the trainer/therapist/exercise specialist to educate himself in the value of prescribed exercise, its components, indications, contraindications, and even its legal implications. The purpose of this paper is to consider the various forms of exercise prescription as a therapeutic modality, the qualifications for administering them, and the elements involved in designing such a therapeutic program.

Exercise Prescription

Random House Dictionary defines a prescription as: "a direction, usually written, by the physician for the preparation and use of a medicine . . ."[8] Ideally, an athletic trainer or exercise specialist should receive a written direction such as:

Jane Doe — Exercise Prescription for Chondromalacia Patellae

Ms. Holland is presently Head Athletic Trainer and Director of the Undergraduate Athletic Training Program at the University of New Hampshire, Durham, NH 03824.

1) Quad setting
2) Last 15 degree knee extension with weights
3) SLR — hip flexion, abduction, adduction
4) Hamstring isometrics at 90 degrees/120 degrees
5) Hamstring stretching

These are concise specifications for the trainer or therapist and leave little room for doubt. However, more often than not a physician does not have the time to spell out each exercise and one might receive a standardized prescription instead; for example, "Williams' flexion exercises for low back syndrome."

More likely, however, athletic trainers may receive a brief description which simply states, "Rehabilitation exercise for fractured clavicle — flexibility/strength." This is in fact a written direction, although it leaves the format and specific exercise design totally up to the trainer/therapist/exercise specialist.

There is yet another prescription style that unfortunately remains the most commonly used direction — the verbal prescription. This may be brought by the athlete: "He wants me to strengthen my shoulder," or it may be relayed by the physician's nurse: "He said to work on straight leg lifts without weights until he sees her again", or it may even be verbalized by the physician himself: "Set him up on the orthotron and see how he does." Not only does the verbal prescription usually leave the creation of the exercise program completely up to one's imagination, but not being a true prescription it also leaves the trainer/therapist vulnerable to legal repercussions. Without adequate knowledge, improper use of exercise can cause untold damage. A trainer remains vulnerable to legal implications until such time as licensure is obtained.

It would naturally be best if all surgeons and physicians wrote out each exercise prescription thus minimizing the margin for error that exists in the present mode of verbal direction; however, as this seems both unrealistic and unlikely we are left with the next best alternative, making oneself as knowledgeable and well qualified as possible to act on verbal prescriptions. It is of course, important that professional personnel (trainers/therapists/exercise specialists) always request a written direction from the physician for their records.

Qualifications

Before filling any prescription the trainer must be qualified to do so. Trainers must ask themselves certain questions, as the athletes and patients should also ask. Do the letters after a name . . . MS, ATC, RPT, EMT, MD . . . give the right according to the law to designate a set of exercises for this individual? Is the trainer protected by the law should any further damage occur after the individual begins the program? Is it within the scope of the trainer's knowledge and

experience to devise an exercise program for this individual? Is there a full understanding of the athlete's condition, or just a vague idea, only through definition of the condition? Is there a full understanding of the anatomical structure, the physiological systems, the kinesthetic concepts, the contraindications so that trainers may consider themselves qualified to set up exercises which will aid rather than further damage this patient?[7] Is there complete knowledge of the fundamentals of "therapeutic exercise" so that there is proper monitering of the prescription?

In light of these questions, and in order to evaluate the authority to administer an exercise prescription, exercise and its components will be considered.

Exercise

Exercise is not a simple concentric contraction of a muscle, nor does it involve a single muscle fiber or motor unit. It is even difficult to isolate totally the specific muscle which needs rehabilitation, for exercise is a "purposeful motion which involves many systems of the body to various degrees."[8]

Rather than discuss each of the body systems that is involved, it will suffice simply to review those important considerations which administrators or exercise programs must be totally aware of in performing actions. They include the muscular system with its differing types of muscles, connective tissue and cell physiology; the cardiovascular system affected by exercise with an increase in efficiency, oxygen, nutrients, and number of vessels; the skeletal system affected by exercise in decreased osteoporosis and increased healing by scar tissue; the nervous system that determines the strength of muscle contraction by the number of motor units fired; and finally a knowledge of kinesthetic mechanics.[4,7,10]

Specifically, kinesthetic mechanics (biomechanics) includes a working knowledge of the origin and insertion of each muscle being exercised, the lever classification, the antagonists, fixators, synergists, and so on.[9] Without this knowledge, it is not likely that maximum effect would be attained from an exercise program. For example, although we may eventually attain our strength objective by other means, might we not attain it sooner if we applied the principle that muscle strength will develop faster if the torque is increased?[9] Therefore we must be aware of the positions in a joint's range of motion, the moment arm length in each position, and what degree of rotation in a joint will produce the greatest overload and thus the fastest strength gain.[9,10] (Figure 1)

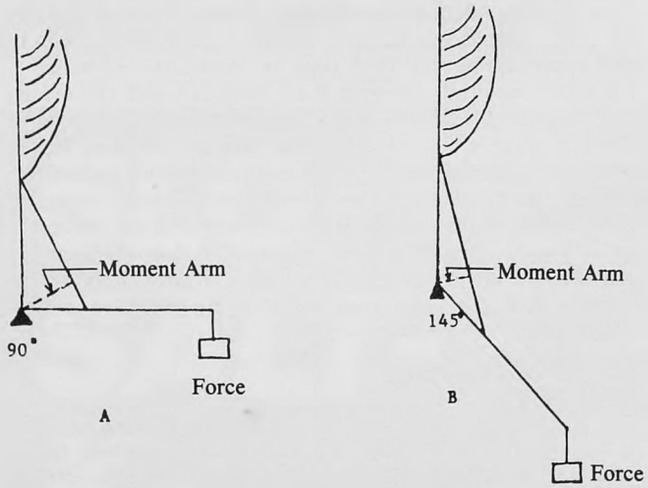


Figure 1: Biomechanical Effects on Strength. Torque = Force x Moment Arm. It takes less force to hold a ten pound weight in anatomical position A than it does in position B. Therefore, in order to increase the strength effort, position B is favored.

Trainers must also be cognizant of the types of muscle contraction and resistance in order to devise the most favorable rehabilitative exercise program. How many forget "the superiority of negative (eccentric contraction) exercise for strength building . . . ;"[9] that eccentric contraction is able to withstand more force thus producing greater strength gain.[4] How often use of isometrics is preferred over isotonics because one cannot see (measure) strength improvement as well? What is the justifiable determining factor in the selection of isometric, isotonic, insoflex or isokinetic modes of exercise? Is it recalled that perhaps "the single most important factor in exercises performed for the purpose of increasing muscular strength" is high intensity muscular contraction?[1] While isotonic exercise apparently causes greater hypertrophy, and more uniform muscle strength,[11] when is it more advantageous to develop strength in a limited segment of the full range of motion? This purposeful motion which is about to be designed or monitored encompasses all of these factors and more. If athletic trainers, exercise specialists, and physical therapists do not have a thorough working knowledge of each factor, as well as the ability to apply that knowledge, they should consider ourselves unqualified to fill an exercise prescription for the purpose of therapeutic rehabilitation.

Therapeutic Rehabilitation

Assuming that trainers are both qualified and knowledgeable they may then use exercise as a therapeutic modality for rehabilitation. The first step is to clearly designate objectives.

The following list of objectives is a basis upon which exercise prescription is designed, as an attempt to prescribe certain bodily movements made in order to restore an injured part while maintaining the full function of the uninjured parts:[5]

1) To rehabilitate the injured part back to its normal function in the shortest possible time.

2) To prevent further functional loss and atrophy to the surrounding body parts.

3) To maintain the status quo of the present body fitness.[2]

In addition to these objectives, the following principles should be established:

1) Obtain a written prescription from the physician and remain in contact with him throughout the patient's program. Although rehabilitation programs may be similar, the individual's progress rate will vary, and some can be pushed faster than others with the physician's approval.

2) Make an initial assessment of the patient's condition upon which further follow-up evaluations can be compared in order to observe their progress. It is not only necessary to perform a thorough evaluation, but also most important to record the findings and update the records with progress notes and alterations in the program (Figure 2).

3) Individualize the prescription to suit the needs of each athlete. Selection of the most appropriate exercise and strength modes should be tailored according to each individual's functional disability as well as his or her athletic activity and the demands which that activity will impose upon the injured part.

4) Monitor the exercises closely throughout the program to avoid improper performance, substitution, and alteration of speed, intensity and range of motion. An overly aggressive individual with a high pain tolerance is likely to work well beyond painfree range of motion and do more harm than good. On the other hand, an individual with a low pain threshold will need to be prodded to work to the point of pain.

Rehabilitation Program Development

The SAID Principle, as described by Allman from Wallis and Logan, 1964, is the most appropriate guide for rehabilita-

Name _____
Address _____
_____
Sport _____ Body Part _____

Nature of Injury _____ Date of Injury _____

MD Diagnosis _____
_____

MD Prescription _____
_____

Therapist Evaluation _____

Date:
Initial Assessment _____
_____

Reassessments

Date	Details

Measurements

Girth											
ROM											
Length											
Date											

Figure 2: Injury Progress Chart.

tion development.[1] Specific Adaptation to Imposed Demands refers simply to a program which is tailored to prepare the injured part for those activities and stresses which will be placed upon it during athletic performance. This requires careful monitoring and consideration of several factors.

First, the specific exercises that will be most useful to the individual must be selected and properly executed, taking care to avoid those exercises which are contraindicated or may irritate another pre-existing condition. During the later stages of rehabilitation the exercises should be as closely associated as possible with the skills which that individual is expected to perform upon complete recovery. Moreover, these final stages of rehabilitation could be considered as the refinement period when it is necessary to alter the program toward neuromuscular or proprioceptive re-education.[5] They might include specific running, throwing and agility patterns with weights or the usual sports equipment. Figures 3 and 4 demonstrate a general rehabilitation progression. Note that throughout the entire rehabilitation development, the uninjured bilateral component as well as the rest of the body should be placed on a maintenance strength (not an increased strength) program.

Next, the frequency of the rehabilitation sessions on an hourly, daily, weekly basis must be constantly altered with the individual's progress.[5] As the athlete commences with the program, his activity may be limited to range of motion and isometric exercises which should be performed frequently during the day.[2] Later in the program when increased intensity is required, the session frequency should be reduced to once daily. This of course is always a variable factor in a rehabilitation program and may change daily according to the specific needs, complications and progress of that individual. Toward the return to activity stage when the rehabilitation is complete, the program frequency should be reduced to a proper maintenance level (3 times per week) for the remainder of the activity season.

Third, the intensity of the program being inversely related to the frequency must constantly be analyzed and changed (Figure 5). The resistance load will increase as the individual gains strength; the speed and number of repetitions and sets will vary according to the desired results, strength or endurance or both; and the strength devices used will necessitate change as the injury repairs and the individual is able to handle more resistance. The intensity development in a rehabilitation program will depend upon the severity of the injury, the age and general fitness of the individual, the psychological desire and motivation to recover, and also the final rehabilitation goals (the demands of that individual's particular sport).

Although one might feel that he is completely recovered when he is able to perform his activity again, the final stage of

Phase 1 **R**ecovery
rest/healing/controlled pain free motion/isometrics
Phase 2 **E**xercise Prescription
rom/isometrics/pre/isotonics
Phase 3 **H**abituation
rom/isometrics/isotonics/isoflex/isokinetics
Phase 4 **A**ctivity Return
flexibility/isometrics/isotonics/isoflex/running/cycling/related activity
Phase 5 **B**ilateral Maintenance and Prevention
full activity/DeLorme isotonics 3x week

Figure 3: General **REHAB** Progression.

Phase	Rest	ROM	Isometric	Manual PRE	Isotonic	Isoflex	Isokinetic	Full Flexibility	Related Neuromuscular	Activity	Full Activity
1	X	X	X								
2		X	X	X	X						
3		X	X		X	X	X				
4					X	X	X	X	X		
5					X		X	X	X	X	X

Figure 4: General Rehab Progression Chart.

any rehabilitation program commences at that time. It is perhaps the most difficult task of the trainer/therapist to educate each injury victim concerning his injury; the damage done; the changed or, in some cases, rearranged structures; the percentage of recovery compared to its bilateral component; and, most importantly, the need for lifetime preventive measures. Therapeutic rehabilitation must continue in the form of prescribed preventive exercise for as long as that individual wishes to be active on a formerly injured body part. With that understanding and self-discipline, he will greatly reduce the chances of reinjury and we as exercise prescriptionists will have completed our rehabilitation program.

Summary

Exercise prescription is fast becoming a popular, effective means of therapeutic rehabilitation in sports injuries. Various forms of exercise prescription are presented showing their all too often nebulous, unstructured design. Those individuals who aspire to construct and monitor exercise prescriptions must be cognizant of the legalities, indications, contraindications, and components of a sound rehabilitation program. They must also be well versed in the anatomical structures, injury indications, and various systems of the body which will be affected during the exercise, each of which is discussed.

The principles and objectives of a sound exercise rehabilitation program are stated in an effort to present a design for such prescriptions which trainers and therapists might apply in their treatments. With proper preparation and monitoring a good exercise prescription can greatly shorten rehabilitation time and prevent further injury or reinjury.

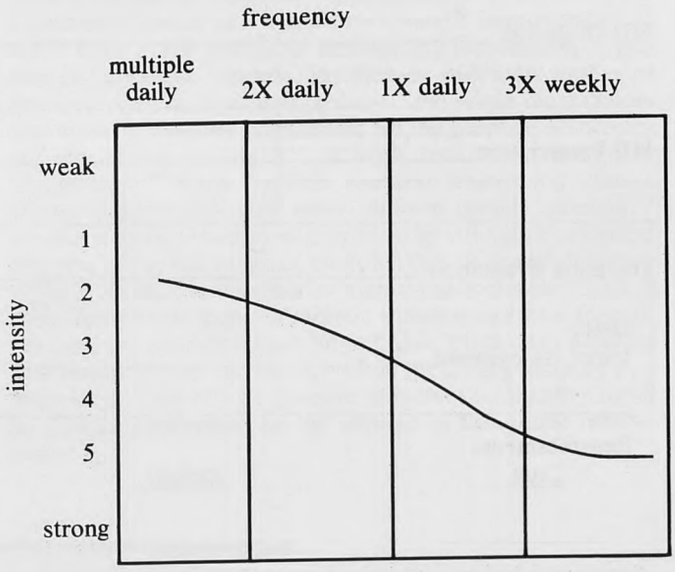


Figure 5: Frequency/Intensity Relationship. As the intensity increases the frequency rate should decrease.

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Guide to Contributors

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The following recommendations are offered to those submitting manuscripts:

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2. Good quality color photography is acceptable for accompanying graphics but glossy black and white prints are preferred. Graphs, charts, or figures should be of good quality and clearly presented on white paper with black ink, in a form which will be legible if reduced for publication. Tables must be typed, not hand written. Personal photographs are encouraged.

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   b. Klafs CE, Arnheim DD: *Modern Principles of Athletic Training*. 4th edition. St. Louis, CV Mosby Co. 1977 p. 61.
   c. Albohm M: Common injuries in womens volleyball. *Relevant Topics in Athletic Training*. Edited by Scriber K, Burke EJ, Ithaca NY: Monument Publications, 1978, pp. 79-81.
   d. Behnke R: Licensure for athletic trainers: problems and solutions. Presented at the 29th Annual Meeting and Clinical Symposium of the National Athletic Trainers Associaton. Las Vegas, Nev, June 15, 1978.
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   If time permits galley proofs of accepted papers will be sent to the author for corrections prior to publication. Reprints of the article may be ordered by the author at this time.
6. It is requested that submitting authors include a brief biographical sketch and acceptable black and white glossy photograph of themselves. Please refrain from putting paper clips on any photograph.
7. Unused manuscripts will be returned, when accompanied by a stamped, self-addressed envelope.

   Address all manuscripts to:

   Clint Thompson
   Department of Athletics
   Michigan State University
   East Lansing, Michigan 48824

The following recommendations are offered to those submitting CASE HISTORIES:

1. The above recommendations for submitting manuscripts apply to case studies as well but only two-copies of report need be sent to the Editor-in-Chief.
2. All titles should be brief within descriptive limits. The name of the disability treated should be included in the title if it is the relevent factor; if the technique or kind of treatment used is the principal reason for the report, this should be in the title. Often both should appear. Use of subtitles is recommended. Headings and Subheadings are required in the involved report but they are unnecessary in the very short report. Names of patients are not to be used, only 3rd person pronouns.
3. An outline of the report should include the following components:
   a. Personal data (age, sex, race, marital status, and occupation when relevant)
   b. Chief complaint
   c. History of present complaint (including symptoms)
   d. Results of physical examination (Example: "Physical findings relevant to the physical therapy program were . . . ")
   e. Medical history - surgery, laboratory exam, etc.
   f. Diagnosis
   g. Treatment and clinical course (rehabilitation until and after return to competition) use charts, graphs when possible
   h. Criteria for return to competition
   i. Deviation from the expected
   j. Results - days missed
4. **Release Form**
   It is mandatory that *Athletic Training* receives along with the submitted case a signed release form by the individual being discussed in the case study injury situation. Case studies will be returned if the release is not included.

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2. Copy should be typewritten, brief, consise, in the third person, and using high quality illustrations and/or black and white glossy prints.

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In order to avoid confusion and delays for any contributions you have for the Journal the deadlines for various sections of the Journal are provided below.

Send all materials for any selection of the Journal other than formal articles and "Calendar of Events" to:

Ken Wolfert
111 Buckeye Street
Hamilton, OH 45011

This includes sections such as "Tips From the Field," "Announcements," "Case Studies," "Letters to the Editor," etc. The deadlines are:

Journal	**Deadline**
Fall Issue	June 15
Winter Issue	September 15
Spring Issue	December 15
Summer Issue	March 15

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Information on upcoming events should be sent to:

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Athletic Department
Oklahoma State University
Stillwater, Oklahoma 74074

Fall Issue	June 15
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The Editorial Board will then review each paper and work with authors to help prepare the papers for publication. Each is handled on an individual basis.

The Athletic Training Major: A Report From The Professional Education Committee

Gary Delforge, EdD, ATC

Historical Perspective

Since 1969, the National Athletic Trainer's Association, primarily through the efforts of the Professional Education Committee, has provided guidance and assistance in curriculum development and has approved athletic training education programs in colleges and universities throughout the United States. As of June, 1982, a total of sixty-two NATA approved undergraduate programs were in existence in thirty-three states. Nine Master's degree level programs have received NATA approval. For the most part, NATA approved athletic training education programs at the undergraduate level represent areas of academic concentration, options, or minors within existing degree programs usually in health or physical education. Over the past fourteen years, standards and criteria for NATA approval of athletic training education programs have continually been upgraded and more precisely defined. It has been most gratifying to note the positive response of college and university personnel to the NATA's continual efforts to promote quality education programs in athletic training. As observed during the Professional Education Committee's five-year evaluations of NATA approved programs, many institutions have gone well beyond the minimal academic requirements as originally established by the NATA and have included advanced coursework in specialized areas of athletic training and sports medicine. Innovative concepts in planning and structuring clinical experiences have been implemented in an increasing number of programs.

While the foresight of Certified Athletic Trainers in implementing these programs and the support of administrative personnel in fostering their development must be recognized, it should also be recognized that continual encouragement must be given to the expansion of athletic training education programs. The increasing level of expertise expected of the contemporary Certified Athletic Trainer as a health care professional has brought with it a corresponding obligation to provide educational experiences commensurate with current and future job expectations. During the 1970s, these realizations became evident to the Professional Education Committee as long-range plans for athletic training education began to formulate. It was also realized that it may not be possible to provide the desirable scope of educational experiences within the confines of academic specializations or concentrations. As the number of NATA approved programs proliferated and as these schools expanded their course offerings, the concept of the athletic training major became increasingly viewed as a reasonable and practical educational goal. In June of 1980, the NATA Board of Directors approved a resolution requiring all NATA approved athletic training education programs to offer a major field of study in athletic training or its equivalent.

In retrospect, it is now apparent that adoption of this resolution represented a major catalyst to continued development and enhancement of athletic training education in the United States. Although several untimely events and unforseeable developments during the past two years have impeded the Professional Education Committee's progress toward development of specific guidelines for the athletic training major, several colleges and universities have accepted the challenge set forth by the NATA and have implemented academic majors in athletic training. Current information indicates that at least ten institutions have either received institutional approval or have implemented athletic training majors. Several others are in the planning and developmental stages. Official NATA recognition of these programs as academic majors will not occur, however, until such time that specific coursework and clinical experience requirements have been developed and programs evaluated accordingly.

Dr. Delforge is Chairman of the NATA Professional Education Committee. He is an associate professor in the Department of Physical Education at the University of Arizona where he serves as Coordinator of the Graduate Athletic Training Education Program, Tucson, Arizona 85721.

Recent Board Actions

During the 1981-82 academic year, several important actions were taken by the NATA Board of Directors regarding the athletic training major. For the most part, the recent Board actions discussed below represent parameters for further development of guidelines for the athletic training major and policies governing implementation of these programs. Also included are comments regarding Professional Education Committee progress and tasks to be completed. It should be noted that these Board decisions not only clarify but, in several instances, modify the original 1980 resolution. Because these new policies may have a significant affect on all undergraduate athletic training education programs, it is especially important that department chairmen and directors of current NATA approved programs as well as college or university personnel contemplating development of new programs are fully aware of the following:

1. On February 7, 1982, the Board of Directors approved a

recommendation that policies requiring NATA approved athletic training education programs (curriculums) to offer a major field of study in athletic training, or its equivalent, apply only to **undergraduate** programs. Thus, current NATA approved **graduate** level programs, or newly developing graduate programs, will not be affected by these new policies.

2. On February 7, 1982, the Board of Directors confirmed an interpretation of the original 1980 resolution which allows for NATA approval of undergraduate programs constituting the "equivalent" of a major in athletic training. Subsequently, on June 15, 1982, the Board of Directors approved the following preliminary definition of the "equivalent" of an athletic training major:

   A course of study in athletic training which is at least equivalent to the minimum number of semester/quarter hours which constitutes a major in the educational unit in which the athletic training education program is housed. The athletic training education program must also be designed so that students are provided with adequate opportunity to meet NATA specified behavioral objectives.

   An example serves as an interpretation of this definition. Should an athletic training education program be housed in a department of physical education and should that particular departmental major require completion of 45 semester units, the athletic training education program must also require a minimum of 45 semester units for completion. However, should it be determined that, as in this example, 45 units provide an inadequate opportunity for students to attain NATA specified behavioral objectives, additional units may need to be added before NATA approval of the program can be granted.

   It should be noted that the policy allowing for NATA approval of the "equivalent" of an academic major precludes the necssity of an athletic training education program involving a "formal" major leading to a bachelor's degree specifically in athletic training. Current policy allows for the identification of existing pertinent coursework within the home department or allied departments, addition of appropriate courses, if necessary, and a "packaging" of these courses within existing degree programs. Development of bachelor's degree programs in athletic training is strongly encouraged, however.

   While the above definition of "equivalent" provides some direction for further development, two important tasks are currently being undertaken by the Professional Education Committee in an effort to define the specific components of an acceptable athletic training major. First, the NATA behavioral objectives included in the 1980 undergraduate Guidelines are being revised. In 1981, the NATA employed the Professional Examination Service (PES) of New York to conduct a nationwide role delineation study. This study was designed to identify the athletic trainer's job responsibilities and corresponding knowledge and skill requirements. Results of this study are expected to contribute significantly to the development of an increasingly valid national certification examination. Relatedly, results of the role delineation study should provide sound rationale for the development of appropriate behavioral objectives for athletic training students who are preparing for the certification examination and careers in athletic training. Thus, revision of the behavioral objectives will be based, in part, on the results of the role delineation study. The second task of the Professional Education Committee will be to develop the content of the athletic training major including coursework and clinical experience requirements. It is expected that these requirements will be a logical outgrowth of the role delineation study results and the revised behavioral objectives.

3. On February 7, 1982, the Board of Directors approved a change in the requirement that all undergraduate athletic training education programs approved by the NATA offer a major field of study in athletic training or its equivalent by July 1, 1986 to a requirement that schools be officially "in the process" of developing a major or its equivalent by this date. Subsequently, on June 15, 1982, it was decided that in order to be considered "in the process" of developing a major, an institution sponsoring a NATA approved undergraduate program must submit the following materials to the Professional Education Committee:

   a. a letter from the chief administrator of the educational unit in which the athletic training education program is housed stating that development of the athletic training major is in process and that it is the institution's intent to implement an athletic training major by the specified deadline (see item 5).

   b. a statement of the goals and objectives of the athletic training major curriculum.

   c. written documents and materials which show evidence of how the program goals and objectives are to be met including identification of existing and/or proposed coursework and clinical experiences.

   d. written materials indicating the procedural steps taken in the development of the athletic training major and letters from institution committee chairmen, department heads, etc. testifying as to the progress made.

4. On June 15, 1982, the Board of Directors approved a policy stating that NATA approval of undergraduate athletic training education programs will be withdrawn if colleges and universities sponsoring existing programs fail to meet the requirements for being "in the process' of developing an athletic training major or its equivalent by the July 1, 1986, deadline.

5. On June 15, 1982, the Board of Directors approved a delay in the original date of required implementation for athletic training majors. Colleges and universities sponsoring NATA approved undergraduate athletic training education programs must now have fully implemented athletic training majors, or their equivalent, by July 1, 1990.

6. By action of the Board of Directors on June 15, 1982, NATA approval will continue to be given to those colleges and universities submitting undergraduate program proposals prior to July 1, 1986, which meet the standards and criteria specified in the 1980 Guidelines (and any subsequent 1980 Guidelines revisions). New programs approved prior to July 1, 1986, must comply with the requirements for being "in the process" of developing an athletic training major by July 1, 1986, and the requirements of full implementation by July 1, 1990.

7. On June 15, 1982, the Board of Directors approved the policy that beginning July 1, 1986, initial NATA approval will be given only to those undergraduate athletic training education program which meet the standards and criteria established for approval of an athletic train-

ing major or its equivalent.

Summary

As might be expected, development of long-range plans for education is often plagued with uncertainties and can often become quite complex. Feedback received so far from program directors and other educators indicates that the timetable and parameters for implementation of athletic training majors outlined above seem to be reasonable and practical. While the NATA Professional Education Committee is encouraged by the acceptance of the athletic training major as a worthy goal, the Committee continually invites constructive criticism and recommendations from college and university administrators and program directors. The Professional Education Committee wishes to work closely with college and university personnel in further development of guidelines and would be most receptive to feedback regarding foreseeable complications and problems. College and university personnel contemplating the development of new undergraduate athletic training education programs for NATA consideration during the next few years are strongly encouraged to remain in close contact with the Professional Education Committee. Yet to be published are the revised behavioral objectives and specific coursework and clinical experience requirements for the athletic training major. As these are developed, information in this regard can be obtained by contacting either of the following: Dan Foster, Chairman, NATA Sub-Committee on Undergraduate Education, Fieldhouse, University of Iowa, Iowa City, Iowa 52242 Telephone: (319) 353-5442 or Gary Delforge, Chairman, NATA Professional Education Committee, Department of Physical Education, University of Arizona, Tucson, Arizona 85721 Telephone: (602) 626-4947. +

Association Activities continued from page 246

Kiyoshi Okugawa
1-10-14 Setoguchi Hirano-Ku
Osaka, Japan 547

Michael Alastair Reid
Flat 34-22 Agnes St. Jolimont
Victoria, Australia

Beryl June Stannard
110 Basinghall St.
Victoria Park East
Western Australia 6101

Tadao Yamanoto
601 Furukawa-Garden Mansion 27
Nishigahara 1-Chome Kita-Ku
Tokyo, Japan

Antonio L. Miguel
Nicholas San Juan 1618
Mexico 12 DF

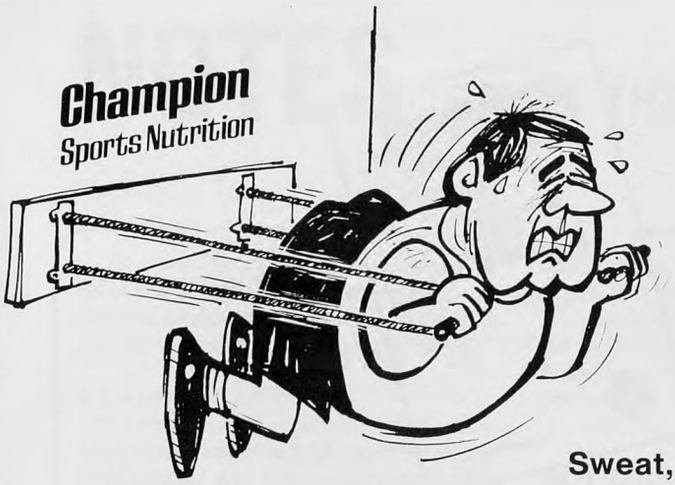
Paul Whiteman
23 Morandoo Ave.
Mt. Keira
N.W.S. 2500
Australia

John T. Ashton
40 Aqueduct Rd.
Diamond Creek
Victoria 3089
Australia

Any international affiliate members not listed should contact the NATA Office, Greenville, NC.

Merle Young, University of Alaska, Fairbanks, was the head trainer for the 1982 Arctic Winter Games. He was assisted by Sandy Caffin, Ben Eielson High School, Fairbanks, Alaska, and Neale Caffin, University of Alaska, Fairbanks. The six-day sports festival provided competition in 15 events for 1,000 athletes from Alaska, the Yukon Territory and the Northwest Territories. The games were founded in 1970 to give northern athletes a chance to demonstrate their skills in events such as snowshoe biathlon, cross country skiing, rope gymnastics and volleyball.

All District Secretaries are kindly requested to forward their newsletters to David Yeo. Information with regard to liaison activities and individual accomplishments and awards can be submitted by anyone in the membership. +



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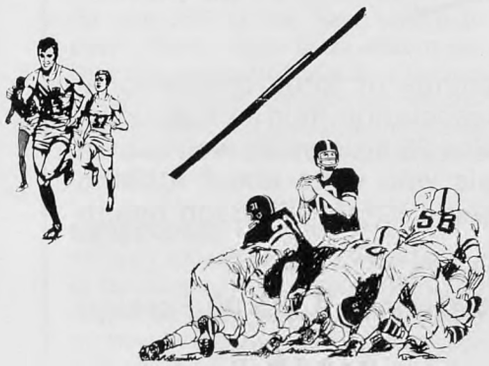

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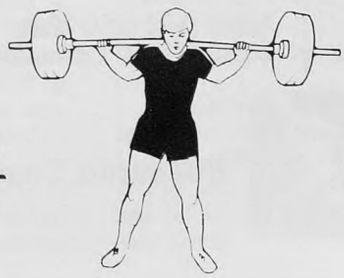

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NOTES FROM THE NATIONAL OFFICE

This new feature of the Journal will inform and update the membership on various subjects of interest and answer the most frequently asked questions.

CLARIFICATION

*** The listing of newly certified members which appeared on page 180 in the Fall Journal was not a complete list for the year 1982 as may have been indicated. Those names listed were members who were certified before the end of June, 1982. A complete list of certified members will appear in the Spring 1983 issue and will reflect ALL certified in 1982.

REMINDER

*** All CEU submittances must be sent to the National Office within thirty (30) days of the date of the activity. Look for the new Requirements and Appeal Process of the CEU Committee in this issue. The CEU report form may be photocopied directly from your Journal.

DISTRICT TRANSFER

*** See page 128 in the Summer '82 issue for the "Application For District Transfer" form which may also be photocopied in accordance with your needs. This form must be filed in triplicate with the National Office when a member changes districts due to a permanent move.

ADDRESS CHANGE

*** NATA members who have an address change within their district need notify the National Office *only once*. We often receive two notices of address change from a member because he or she believes separate notification must be sent to the Journal. This is not the case. Each NATA member has ONE address of record on file at the National Office computer. When an address change is processed, that member's address is corrected on *all mailing lists*. This includes the mailing list for ATHLETIC TRAINING. So you may save 20¢ postage, as well as some time, by sending only one notification of address change to the National Office. Your mailing label for the Journal will automatically be updated. Please be reminded, however, that while your regular first class mail will be forwarded by the post office after your move, your Journal will not be forwarded due to its second class status. ALWAYS advise your post office to forward your second class mail as well as the first class mail. There is a small charge for the second class mail forwarding — usually 30¢ to 40¢ — but this is much more economical in the long run than replacing a missing Journal for $5.00.

HOT LINE

*** The number for the 24-hour telephone "HOT LINE" offering instant job opportunities is (919) 752-1266. Two different tapes are used. Graduate Assistantship tape is run on Monday, Wednesday and Friday from 5:00 pm until 9:00 am the following working day. General employment tape is run at all other times. Have pen and paper available to take down the following information: Position Title, Location, Brief Qualifications, Person to Contact, Deadline. A current Placement File is also maintained by Committee Chairperson Craig Sink. If you would like to be included in this cross-indexed file, mail your resume to him at NCSU, Box 5187, Raleigh, NC 27650.

DUES

*** If you have not yet paid your 1983 membership dues, please do so immediately to avoid inactive status. *Please be sure to return your invoice for proper credit.*

CERTIFICATION

*** Certification candidates with applications on file should be certain their addresses are current in the Certification Office. This may be a temporary address during the period of candidacy in order to assure prompt receipt of pertinent examination information and results.

There will be an additional site for the July 31, 1983 exam in Raleigh, NC.

All requests for applications for the Certification exam must be in writing. Please specify the Section under which you will be applying (as indicated in the "Procedures for Certification") i.e.: Section I — Approved Curriculum; Section II — Internship; Section III — Actively Engaged, Uncertified; Section IV — Physical Therapy Degree Graduate.

A reminder to interns and supervisors of interns: All hours must be submitted to the Certification Office in Greenville, NC by December 1983. See pages 186 and 187 in the Fall '82 issue for necessary forms.

TAPES

*** Information on ordering cassette tapes appears in this issue. NATA is making this most valuable opportunity available to its membership to assist in expanding professional horizons. These tapes will aid in the advancement of your profession and be an invaluable instruction tool as well as an asset to your personal or departmental library.

CLASSIFICATION

*** A change in membership classification can be accomplished *ONLY* by submitting the properly completed "Change of Classification Application" form in triplicate to the National Office. If you wish to change your classification, these necessary forms may be requested from the Membership Office.

BACK ISSUES

*** The response to the appeal for back issues of the Journal (Fall, p. 185) was fantastic! Profuse thanks to the following members who, by their interest and generosity, have helped to build a complete Journal reference library from which all may benefit: John Omohundro, Ralph Berlin, Jeff Fair, Leroy Mullins, John Lacey, Keith Fitzpatrick, Marv Roberson, Edward Koehler, Robert White, Bill Battershall, George H. Christman Jr., Eddie Kwest, Dick Iliano, and James B. Laughnane.

CONFERENCE & CLINICAL SYMPOSIUM CASSETTES AVAILABLE

Cassette tapes are now available through the NATA for placement in your professional audio library. Purchase of audio cassettes of NATA approved proceedings earn .1 CEU per tape acquired for NATA Certified Athletic Trainers. Presentations are available as individual tape copies at $7.00 each unless indicated otherwise. Please use or photocopy form for ordering.

NATA Annual Meeting & Clinical Symposium
Fort Worth, Texas
June 7-10, 1981

8101 (2 Tapes) $12.00	"Opthomology And The Athletic Trainer: Sports Injuries To The Eye" John Zerdecki, MD

8102 (2 Tapes) $12.00 "Gynecology And The Athletic Trainer: Injuries Relating To The Female Athlete"
Don Smith, MD

8103 (2 Tapes) $12.00 "SCHERING SYMPOSIUM"
"Enigmatics Of The Anterior Cruciate Ligament"
Vince DiStefano, MD

"Non-Operative Soft Tissues Of The Knee"
J. Pat Evans, MD

"The Athlete's Foot"
Jack H. Henry, MD

"Groin And Hamstring Injuries"
Paul Casperson, MD

8104 KEYNOTE ADDRESS
Tom Wilson, ATC

8105 "Initial Transportation Of A Severely Injured Athlete"
T.C. Skip Cox, ATC

8106 "The Use Of Effective Therapeutic Massage In The Treatment Of Athletic Injuries"
Becky Bludau, ATC

8107 "The Use Of E.G.S. As A Diagnostic & Treatment Tool For Athletic Inuries"
Bernie La Rue, ATC

8108 "Conditioning In Pre-Season Practice"
Bobby Lane, ATC

8109 "Acupuncture"
Jim Montgomery, MD

8110 "Gambling Problems in Collegiate Sports As It Relates To The Athletic Trainer"
Hale McMenamin, NCAA

8111 "Licensing Of The Athletic Trainer"
Texas Advisory Board of Athletic Trainers

8112 "Physiological Consequences Of Deconditiong And Retraining"
Robert Patton, PhD

8113 "Hamstring Injuries"
Ken Locker, ATC

8114 "Hand Injuries"
Dennis Hart, ATC

8115 "Evaluation Of Knee Injuries"
John Gunn, MD

8116 "Basic Treatment Of Myofacial Strains And Sprains"
Wayne English, DO

8117 "Arthroscope Of The Knee"
Thurston Dean, MD

8118 "High School Budget Problems"
Doug Gibbons, ATC

8119 "Ankle Injuries"
J. Pat Evans, MD

8120 "Toe Injuries"
Dean Weber, ATC

8121 "Ankle Rehabilitation"
Larry Gardner, ATC, LPT

8122 "The Trainer And His Team Doc"
James A. Bowden, MD

8123 "Aerobic Conditioning As It Relates To Team Sports"
Larry Gibbons, MD

8124 "Arthroscope — Other Than The Knee"
Robert Vandermeer, MD

8125 "Shoulder Injuries"
Louis Levy, MD

8126 "Paper Work — Versus People Work"
Jerry Rhea, ATC

8127 "Joint Stress Through High Speed Photographic Analysis"
Peter McGrain, PhD & Marilyn Hinson, PhD

8128 "Weight Training"
Tim Kerin, ATC

8129 "How To Prepare The Athlete For Competition"
Don Cooper, MD

Professional Preparation Conference
Pittsburgh, Pennsylvania
January 8-10, 1982
NATA Professional Education Committee

PP 8201 "Selling Athletic Training in the High Schools"
Phillip Kanfush, Principal

PP 8202 "Directions of Canadian Athletic Training Education"
Barry Bartlett, Canadian Athletic Trainers' Association

PP 8203 "Pathophysiology and Mechanisms of Cervical Spine Fractures"
Joseph Maroon, M.D.

PP 8204 "Physiologic Basis of Year-Round Physical Conditioning"
Robert J. Robertson, Ph.D.

PP 8205 "Physiology and Pharmacology of Anti-Inflammatory Medications in Athletics"
Regis R. Vollmer, Ph.D.

PP 8206 "Participation for the Athlete with Acute or Chronic Systemic Disease"
H. Lee Dameshek, M.D.

PP 8207 "Alterations and Long-Term Implications in Knee Function Following Trauma"
Richard L. Ray, M.D.

PP 8202 "Implications of Specificity in Strength Training"
George Carvell, LPT

PP 8209 "Clinical Aspects of the Cybex in Professional Baseball"
Charles Moss, ATC

PP 8210 "Sports Epidemiology"
Thomas Peterson, M.D.

PP 8211 "The Musculoskeletal Examination"
George Snook, M.D.

Professional Preparation Conference
Denver, Colorado
February 5-7, 1982
NATA Professional Education Committee

DC 8201 "Psychology of the Young Athlete"
— Robert Compton, PhD

DC 8202 "Physiological Profiles of Competitive Athletes"
— Gene Hagerman, PhD

DC 8203 "Modern Techniques in the Orthopedic Examination"
— James McElhinney, MD

DC 8204 "The Athletic Trainer's Role in the Physical Examination"
— Dan Libera, ATC

DC 8205 "Physiological Responses to Trauma"
— Thomas Mahoney, MD

DC 8206 "Physiology of Heat and Cold as Related to Therapeutic Modalities"
— Bruce Kola, ATC

DC 8207 "Neurophysiological Mechanisms in Exercise"
— Marjorie Woollacott, PhD

DC 8208 "Bases for Therapeutic Exercise Techniques"
— Robert Moore, PhD, ATC, RPT

DC 8209 (Two tapes) "Ergogenic Aids in Sport — Nutritional, Pharmacological and Hematological"
— Melvin Williams, PhD

Professional Preparation Conference
Palo Alto, California
February 6-8, 1982
NATA Professional Education Committee

PA 8101 "Legal Considerations In Athletic Training and Sports Medicine"
Richard Ball, Attorney

PA 8102 "Musculoskeletal Injuries In the Adolescent Athlete"
Donald Schroeder, M.D.

PA 8103 "Clinical Evaluation of Acute Ankle, Knee, and Shoulder Injuries"
James Glick, M.D.

PA 8104 "Diagnosis and Management of Anterior Cruciate Injuries"
George Hewson, M.D.

PA 8105 $5.00 "Rehabilitation of Surgical Knee Injuries — Surgical Arthroscopy"
Jim Wlesh, ATC; RPT

PA 8106 $5.00 "Rehabilitation of Surgical Knee Injuries — Anterior Cruciate Repair"
Joseph Webb, ATC; RPT

PA 8107 $5.00 "Rehabilitation of Surgical Knee Injuries — Lateral Retinaculum Release"
Sue Anthony, ATC; RPT

PA 8108 "Conventional Uses of Therapeutic Modalities"
Don Chu, ATC; RPT; Ph.D.

PA 8109 "Flexibility and Injury Prevention"
Leon Skeie, ATC

PA 8110 "Prevention of Head and Neck Injuries"
Lindsy McLean, ATC; RPT

PA 8111 "Evaluation of Low Back Injuries"
Michael Go, ATC; RPT

NATA Annual Meeting & Clinical Symposium Seattle, Washington June 13-16, 1982

8201 Tape one — C. Gerald Warren, RPT
Therapeutic Modalities & The Athletic Trainer

8202 Tape two — C. Gerald Warren, RPT
Therapeutic Modalities & The Athletic Trainer

8203 Tape one — John Olerud, MD
Dermatology & The Athletic Trainer

8204 Tape two — John Olerud, MD
Dermatology & The Athletic Trainer

8205 Tape one — Nathan Smith, MD
Nutrition & The Athletic Trainer

8206 Tape two — Nathan Smith, MD
Nutrition & The Athletic Trainer

8207 William Clancy, MD
Knee & Thigh Injuries Diagnosis, Treatment & Functional Emphasis on Mild to Moderate Knee Injuries

8208 Vincent DiStefano
Lateral Compartment of the Knee

8209 Jay Cox, MD
Diagnosis & Management of Ankle Injuries

8210 Peter Fowler, MD
Arthroscopic Update/Diagnosis & Treatment

8211 Naseby Rhinehart, ATC
Keynote Address — The Physician — The Trainer's Bible

8212 H. Royer Collins, MD
Low Back Injuries in Athletics

8213 James R. Robbins, MD
Effects of Steroids on Ligaments & Tendons

8214 Steven T. Bramwell, MD
Open Repair & Early Motion Rehabilitation on Ruptured Achilles Tendon

8215 John Olerud, MD
DMSO — A Literature Review

8216 Pierce E. Scranton, MD
Alterations in Support Phase Forces Using Supportive Devices

8217 Letha Y. Hunter, MD
Pharmacology in Athletics

8218 June Brooks Robbins, ATC
Swimmer's Shoulder & Prevention, Treatment & Rehabilitation

8219 Lynda L. Griffith, ATC
Ankle Joint Mechanics & Return to Competitive Activity

8220 Bob Grams, ATC
Fitness Maintenance for the Injured Athlete

8221 Stan Newell, DPM
High Speed Film Analysis of Lower Extremity Overuse Injuries

8222 Kathy Rockerfeller, ATC
Dance Injuries & The Athletic Trainer

8223 James P. George, DDS, MSD
Selection of MORA Candidates: A Scientific Approach

8224 LaVar H. Riniker, DDS
Cranio-Cervical-Mandibular Syndrome in Athletics

8225 William Heintz, DDS
The Adverse Effects of MORA in Contact Sports

8226 Tape one — Larry Pedegama, MD; Rich Elsner, ATC, RPT
Upper Extremity Injuries: An Overview

8227 Tape two — Larry Pedegama, MD; Rich Elsner, ATC, RPT
Upper Extremity Injuries: An Overview

8228 Richard A. Black
Legal Aspects of Athletic Training Today

8229 Walt Krengel, MD
Cruciate Substitution in Knee Reconstruction with Consideration for Rehabilitation

8230 Richard Parr, EdD
Current Nutrition Knowledge & Practices of Athletes, Coaches & Athletic Trainers

8231 Sayers John Miller, III, ATC
Spinal Mobilization in Athletic Training

8232 Stephen G. Rice, MD, PhD
Exercise Inducted Broncho-Spasm

8233 Side one — Leesa DiBartola, ATC
Anorexia & Bulimarexia

Side one — Theodore Becker
Screening the Competitive Swimmer for Participation

Side two — Timothy M. Madden, MS, ATC
The Relationship between Pre-Season Conditioning & HS Football Knee Injuries

8234 Side one — Steve Simpson, ATC
Record Keeping in Athletic Training

Side one — Brad Agerup, ATC
Orthoplast Preventive Ankle Brace

Side two — Cheryl Cole, ATC
Menstrual Dysfunction in Female Athletes

8235 Side one — Mark Hagenbaugh, RPT
Biomechanical Assessment of Running Shoes & Orthotics Using Video Analysis

Side one — Lynn M. Conley, ATC
Nebraska High School Athletic Care

Side two — Bernie E. LaReau, ATC
The Injury Rate in Professional Basketball

Side two — Robert Worden, ATC
Relationship of Coaching Variable to Male High School Soccer Injuries

8236 Richard Hall, RPT, ATC
Soft Playing Splint for Significant Hand & Wrist Injuries

8237 Stephen G. Rice, MD, PhD
Athletic Health Care & Training Program — A Model Program

8238 Nathan J. Smith, MD
Sports Anemia

8239 Ronald E. Smith, MD
Coping with Stress & Burnout

INDEX TO VOLUME 17

PROCEEDINGS of the BOARD OF DIRECTORS NATIONAL ATHLETIC TRAINERS' ASSOCIATION

June 6-11, 1982
Westin Hotel
Seattle, Washington

SUMMARY OF ACTIONS NATA BOARD OF DIRECTORS

The following agenda items were considered and actions taken by the NATA Board of Directors at its meeting held on June 6-11, 1982, at the Westin Hotel, Seattle, Washington, Mr. William Chambers, President, presiding and with the following present:

Mr. William H. Chambers, President
Mr. Otho Davis, Executive Director
Mr. Bruce Melin, Parliamentarian
Mr. Jack Baynes, District 1
Mr. Richard Malacrea, District 2
Mr. Harold Biggs, District 2
Mr. Andy Clawson, District 3
Mr. Hunter Smith, District 3
Mr. Robert Behnke, District 4
Mr. Frank Randall, District 5
Mr. Cash Birdwell, District 6
Mr. Paul Zeek, District 6
Mr. Dale Mildenberger, District 7
Mr. Roger Dennis, District 8
Mr. Bobby Barton, District 9
Mr. Roy Don Wilson, District 9
Mr. Gary Craner, District 10
Mr. Mark Smaha, District 10

I. REAFFIRMATION OF MAIL APPOINTED ITEMS:

Moved by District 7, seconded by District 2, put to a vote and carried 10-0 to approve mail appointed items.

The items are as follows:

Reappointment as committee members:

A. **Audio Visual Aids**
Robert Gray, District 4
Lorain, OH
Robert E. Smetanka, District 8
San Francisco, CA
Dennis Murphy, District 10
University of Montana
Jerry Nowesnick, District 4
College of DuPage

B. **Career Information and Services**
Robert Behnke, District 4
Indiana State University
Fred G. Kelley, District 1
Dartmouth College

C. **Continuing Education**
Harriett Pearce, District 1
Mass. Institute of Technology
Donald Kessler, District 2
Princeton University
Debbie Granner, District 3
University of South Carolina
Fred Turner, District 4
Hazelcrest, IL
Reginald Speak, District 5
Bettendorf, IA
Ronald Carroll, District 6
Arkansas State University
Mike Nesbett, District 7
Northern Arizona University
Larry Krock, District 8
California State — Northridge
Linda Arnold, District 9
Memphis State University
Jackie Leander, District 10
University of Idaho

D. **Drug Education**
Scott Biron, District 1
University of New Hampshire

E. **Grants and Scholarships**
Tenley Albright MD
Boston, MA
Robert Brashear MD
Knoxville, TN
C. Carson Conrad
Washington, DC
Don Cooper MD
Stillwater, OK
Elvin "Ducky" Drake, District 8
UCLA
Cliff Fagan
Crystal Lake, IL
A.C. "Whitey" Gwynn, District 3
West Virginia University
Thomas Hamilton
La Jolla, CA
Kenny Howard, District 9
Auburn, AL
Charles Medlar, District 2
Penn State University
Gene Monahan, District 2
New York Yankees Baseball Club
Don H. O'Donoghue MD
Oklahoma City, OK
Joles Reichel
Syracuse, NY
W.K. Smith MD
Cheswick, PA
Howard Waite
Tucson, AZ

F. **Journal**
Dennis Aten, District 4
Eastern Illinois University
Ed Christman, District 9
Knoxville, TN
Jeff Fair, District 5
Oklahoma State University
Kathy Fox, District 9
University of Central Florida
Sue Halstead, District 3
University of Virginia
Don Kaverman, District 4
Ferris State College
Grand Rapids, MI
Kenneth Knight, District 4
Indiana State University
Dan Libera, District 7
University of Northern Colorado
Bob Moore, District 8
San Diego State University
Jim Rankin, District 4
Michigan State University
Clint Thompson, District 4
Michigan State University
John Wells, District 3
Mars Hill College
David Yeo, District 2
Montgomery Community College

G. **Memorial Resolutions**
Connie Bauman, District 1
Wellesley College
Donald Kessler, District 2
Princeton University
Max Crowder, District 3
Duke University
Dennis Helwig, District 4
University of Wisconsin
Ivan Milton, District 5
Southwest Missouri State University
Ken Murray, District 6
Texas Tech University
Tom Abdenour, District 7
Weber State College
William Nakaso, District 8
San Jose City College
Warren Morris, District 9
University of Georgia
Gary Smith, District 10
Spokane, WA

H. **Placement**
Phillip Mateja, District 1
University of Maine — Orono
John Sciera, District 2
SUNY at Cortland
Terry Middleswarth, District 3
UNC — Wilmington, N.C.
Larry Leverenz, District 4
Western Illinois University
Jim Booher, District 5
South Dakota State University
Steve Smith, District 6
Texas A&M University
Larry Willock, District 7
University of New Mexico
Jerry Lloyd, District 8
California State — Fullerton
Ernie Golin, District 9
Athens, GA
Phil Luckey, District 10
Idaho State University

I. **Professional Education**
Gerald Bell, District 4
University of Illinois
L.F. "Tow" Diehm, District 7
University of New Mexico
Joanne Dolcemaschio, District 1
Brown University
Dan Foster, District 5
University of Iowa
Ken Murray, District 6
Texas Tech University
Louis Osternig, District 10
University of Oregon
David Perrin, District 2
University of Pittsburgh
William Prentice, District 3
University of North Carolina
Al Proctor, District 3
Raleigh, N.C.
Jack Redgren, District 9
Nashville, TN
Dennis Sealey, District 10
University of Washington
Ron Sendre, District 4
Central Michigan University
Leon Skeie, District 8
Orange Coast Junior College
Glen Snow, District 4
New Albany, IN

J. **Publications**
Rick Carey, District 4
La Grange, IL
Karl Glass, District 4
Southfield, MI

2. Resignation of Paul Zeek, Lamar University, District 6, as member of Continuing Education Committee.

3. Resignation of L.F. "Tow" Diehm, University of New Mexico, District 7 as chairman of Ethics Committee.

4. Resignation of Ray Baggett, Indiana State University, District 4, as member of Journal Committee.

5. Resignation of Larry Standifer, Eugene, Oregon, District 10, as member of Licensure Committee.

6. Appointment of Jerry Lewis, Antelope Valley College, District 8, as member of Licensure Committee.

7. Appointment of Larry Leverenz, Western Illinois University, District 4, as member of Placement Committee.

8. Appointment of Ernest Golin, Athens, GA, District 9, as member of Placement Committee.

9. Appointment of Phillip Luckey, Idaho State University, District 10, as member of Placement Committee.

10. Resignation of Kathy Doyle, Eastern Illinois University, District 4, as member of Placement Committee.

11. Resignation of John Schrader, Indiana University, District 4, as member of Professional Education Committee.

12. Honorary Membership approved for:
James R. Andrews, M.D.
Jim Cody
Arthur E. Ellison, M.D.
William B. Ferguson, M.D.
Richard Gardner, M.D.

13. District Liaison representation with The American Orthopaedic Society of Sports Medicine.

14. Approved $3,600.00 for addition to display at College Football Hall of Fame.

15. **Football News** subscription discount to NATA membership.

16. New postgraduate scholarship award to be sponsored by School Health Supply Company in honor of co-founders, Mr. Good and Mr. Smith.

II INFORMATIONAL REPORTS:
The following reports having been submitted with no action recommendations contained therein, the Board by motion made by District 7, seconded by District 9, and carried, accepted them for information:
American Alliance for Health, Physical Education, Recreation and Dance
American College Health Association
American Corrective Therapy Association
National College Athletic Association Football Rules Committee
National Head and Neck Injury Registry

III CAREER INFORMATION AND SERVICES:
Motion to reapprove Committee members Charles Demers, Chairman, Robert Behnke and Fred G. Kelley made by District 10, seconded by District 9 and carried.

IV DRUG EDUCATION:
Motion to approve Committee members John Wells, Chairman, John Wells and Scott Biron made by District 3, seconded by District 10 and carried.
Motion to accept Items 1, 2 and 3 of report for informational purposes made by District 7, seconded by District 2 and carried.

V HISTORY AND ARCHIVES:
Moved by District 9, seconded by District 10 to establish a depository for NATA records and summaries of Board meetings and conventions through Michael O'Shea. Motion carried.

VI HONOR AWARDS:
Motion by District 8 seconded by District 2 to approve the Twenty-Five Year Award winners as listed. Motion carried.
Motion by District 1, seconded by District 2 to approve the various winners as listed for the Hall of Fame Awards. Motion carried.
Motion by District 4, seconded by District 6 and carried to approve Dr. L.W. Combs for Presidential Award.
Motion by District 10, seconded by District 1 and carried that the Honor Awards Committee review application forms for awards and make a more professional and better type application form, to be submitted by October 1.

VII LICENSURE COMMITTEE:
Motion by District 5, seconded by District 8 to approve committee members Pinky Newell, Paul Grace, Troy Young and Bobby Barton. Motion carried.
Motion to accept Committee report for informational purposes made by District 5, seconded by District 7 and carried.

VIII MEMORIAL RESOLUTIONS:
Motion to approve Committee members Connie Bauman, Donald Kessler, Max Crowder, Dennis Helwig, Ivan Milton, Ken Murray, Tom Abdenour, William Nakaso, Warren Morris and Gary Smith made by District 5, seconded by District 7 and carried.

IX PLACEMENT:
Motion made by District 2, seconded by District 6 to accept the Placement "Hot Line" and discontinue Position Vacancy Notices. Carried.

X RESEARCH AND INJURY:
Motion made by District 7, seconded by District 1 and carried to approve committee members Bob Moore and Steve Antonopulos.

XI FUNDS FOR PORTRAITS:
Motion made by District 2, seconded by District 1 and carried to approve appropriate funds for color photographs.

XII FUNDS FOR OFFICE SIGN:
Motion made by District 10, seconded by District 2 to investigate the subject further and secure three bids to meet zoning requirements, which are to be submitted to the Executive Director.

XIII ELECTION OF VICE PRESIDENT:
Mr. Robert Behnke was elected Vice President.

XIV APPOINTMENT OF EXECUTIVE DIRECTOR:
Mr. Otho Davis was reappointed Executive Director. Motion made by District 5, seconded by District 3 and carried.

XV MAGINNIS AND ASSOCIATES:
Motion by District 7, seconded by District 2 and carried that the Executive Director talk to Mr. Lang about segregating the athletic trainer as to where he is employed for insurance purposes.

XVI MEMBERSHIP:
Charles Chartier Case. Motion made by District 7, seconded by District 3, to support March 23rd letter from Executive Director to Mr. Chartier advising him he had been removed from NATA membership list for nonpayment of dues. Motion carried.

XVII BYLAWS REVISIONS:
Retired Classification, Article XXX, Section 1,
3.1.0, moved by District 7, seconded by District 10 to accept as proposed. Carried.
3.2.0, moved by District 7, seconded by District 10 to accept as proposed. Carried.
3.2.1, moved by District 7, seconded by District 10 to accept as proposed. Carried.
3.2.2, moved by District 5, seconded by District 1 to delete. Carried.
3.2.2, moved by District 7, seconded by District 9 to read, "If a person is granted retired status and resumes the practice of athletic training, he/she must notify the National Office. The person will then be reclassified to the membership classification in accordance to his/her eligibility and assessed dues for the current year." Carried.
3.2.3, moved by District 5, seconded by District 7 to delete. Carried.
3.3.0, moved by District 7, seconded by District 9 to accept as proposed. Carried.
3.4.1, moved by District 7, seconded by District 8 to accept as proposed. Carried.

XVIII BYLAWS REVISION:
Allied Classification, Article XXX, Section 1,7.0.0.
7.1.0 moved by District 10, seconded by District 8 to approve change which is to read, "This membership class is open to individuals whose business interest or employment are related to athletics in general." Carried.
Certification Committee, Article XI, Section 6, No. 1 and No. 2.
Motion to eliminate Section 6, No. 1 and No. 2 made by District 5, seconded by District 1 and carried.
Motion by District 5, seconded by District 1 and carried new Section 6 to read, "The functions and responsibilities of the Committee are to coordinate and administer the certification examination."
Publications Committee, Article XXVIII, Section 6, No. 1.
Moved by District 5, seconded by District 1 to accept with the addition of the words, "as directed by the Board", immediately following, "NATA Athletic Training". Carried.

XIX NATIONAL CONVENTION:
Motion by District 6, seconded by District 7 to approve Mr. Fred Hoover's budget as submitted. Carried.
Motion by District 10, seconded by District 7 to accept Mr. John Pickering's report on computerization as informational. Carried.
Motion by District 10, seconded by District 6 to accept Items III and IV for informational purposes. Carried.
Motion by District 9, seconded by District 1 commending District 10 for the work they have done in conducting the convention. Carried.

XX AMA LIAISON CONTACT MEETING:
Motion by District 9, seconded by District 1 and carried to accept the report for informational purposes.

XXI ETHICS:
Article I, add new Section 8, "Membership Status", to read, "It is unethical for a member to misrepresent his/her membership status and/or

classification. Moved by District 8, seconded by District 1 and carried.

XXII RESEARCH AND INJURY COMMITTEE:

By laws Changes: Section 6.

Revision 3: Informs District Directors of well conducted research related to athletic training for possible inclusion in programs of district meetings.

Revision 4: Informs chairmen of National Annual Meeting and Clinical Symposium Committee of well conducted research related to athletic training for possible inclusion at the Annual Meeting and Clinical Symposium.

Motion made by District 9 to accept, seconded by District 1. Carried.

XXIII UNITED STATES OLYMPIC COMMITTEE:

Motion by District 8, seconded by District 5 to add under functions of the committee that the chairman of the Committee be the liaison representative to the Sports Medicine Council and Clinic Committee. Carried.

Motion by District 6, seconded by District 7 to appoint Troy Young as the liaison. Carried.

XXIV ANNUAL PREPARTICIPATION PHYSICAL EXAMINATIONS:

Moved by District 2 an amendment to the proposed resolution as follows: Take the second Whereas out and insert, "It has been demonstrated that physical and physiological capability for sports may be ascertained through a program of preparticipation medical evaluation."

The first whereas and the third whereas remain as is. Then strike the next two paragraphs. Then insert, "BE IT RESOLVED: That the National Athletic Trainers Association supports the concept of a preparticipation medical examination which includes an examination by a duly licensed physician on an annual basis." Motion seconded by District 8 and carried.

XXV NATIONAL ANNUAL SYMPOSIUM AND WORKSHOP COMMITTEE:

Moved by District 7, seconded by District 3, that the committee members be approved as follows: Fred Hoover, Tim Kerin, John Pickering and Dean Weber. Carried.

Moved by District 8, seconded by District 7, to go to a concept of West-Central-Central-Central-East-Central-Central-Central-West for meeting sites and that Mr. Hoover look in to the bidding system for such sites. Carried.

Moved by District 7, seconded by District 3 that the rotation would be West 1986, Central 1987, East 1988, Central 1989, 1990, 1991, West 1992, Central 1993, 1994, 1995, East 1996. Carried.

Moved by District 8, seconded by District 1 to approve recommendation to have Student Trainers Luncheon instead of banquet. Carried.

XXVI MEETING OF THE NATA FOUNDATION:

Motion to approve the minutes of the February 1982 meeting in Greenville made by District 9, seconded by District 10 and carried.

Motion by District 10, seconded by District 1 to approve the financial statement. Carried.

XXVII PRINTING EQUIPMENT:

Motion by District 8, seconded by District 9 to accept Mr. McIntyre's recommendation to not purchase printing equipment. Carried.

XXVIII FINANCIAL REPORT:

Motion by District 2, seconded by District 7 that Mr. McIntyre estimate the cost of inflation, to be submitted to the Executive Director by January 1, 1983. Carried.

XXIX UNIFORM DUES STRUCTURE:

Motion by District 2, seconded by District 10 that all dues structures be uniform throughout as far as the National Office, from Certified and through all classifications except Student. Carried.

XXX GRANTS AND SCHOLARSHIPS COMMITTEE:

Motion by District 9, seconded by District 2 to accept report for informational purposes. Carried.

Motion by District 7, seconded by District 8 to approve the budget request and financial statement as submitted. Carried.

Motion by District 4, seconded by District 8 to approve in concept the Endowment Fund. Carried.

Motion by District 10, seconded by District 9 to approve the list of scholarship winners. Carried.

Motion by District 10, seconded by District 9 to approve the Committee members as follows:

Dr. Tenley Albright
Dr. Robert Brashear
Mr. C. Carson Conrad
Dr. Don Cooper
Mr. Elvin Drake
Mr. Cliff Fagan
Mr. A.C. Whitey Gwynne
Mr. Thomas Hamilton
Mr. Kenneth Howard
Mr. Charles Medlar
Mr. Gene Monahan
Dr. Don O'Donoghue
Mr. Jules Reichel
Dr. W.K. Smith
Mr. Howard Waite
Ex Officio Dr. Bobby Barton

XXXI LIAISON WITH AMERICAN ORTHOPEDIC SOCIETY:

Motion by District 10, seconded by District 8 to permit the Society to pick their own representatives to NATA. Carried.

XXXII AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS AND THE NATIONAL ASSOCIATION OF SCHOOL BOARDS:

Motion by District 2, seconded by District 1 to accept Items 1 through 4 for informational purposes. Carried.

Motion by District 5 seconded by District 8 that NATA be represented at the National Association of School Boards meetings. Carried.

XXXIII PROFESSIONAL EDUCATION COMMITTEE:

Motion by District 7, seconded by District 10 to approve their annual report. Carried.

XXXIV PUBLIC RELATIONS COMMITTEE:

Motion by District 1, seconded by District 8 that the report be accepted for informational purposes. Carried.

Motion by District 5, seconded by District 2, that Mr. Vandervoort submit a timetable of what he plans to do and how he is going to do it, a midyear report and also an in-depth report by April 1, 1983. Carried.

XXXV AUDIO VISUAL COMMITTEE:

Moved by District 9, seconded by District 10 that Items 1, 3 and 5 of the report be accepted for informational purposes. Carried.

Budget submitted of $1255. Motion by District 6, seconded by District 2, to approve the budget as submitted. Carried.

Moved by District 3, seconded by District 10 to approve committee members as follows: Robert Gray, Robert Smetanka, Dennis Murphy, Jerry Nowesnick. Carried.

Motion by District 10, seconded by District 6 that the proposed budget request for audio-visual equipment be approved and that in three years if it has not paid for itself, the Executive Director to pay the difference. Carried.

Motion to accept Item 2 of Mr. Strief's report for informational purposes made by Division 9, seconded by Division 7 and carried.

XXXVI JOINT COMMISSION OF COMPETITIVE SAFEGUARDS AND MEDICAL ASPECTS OF SPORTS:

Motion to continue liaison with Commission made by District 9, seconded by District 1. Carried.

Motion to approve Commission's change in meeting times, a bylaw change, made by District 2, seconded by District 1. Carried.

XXXVII NATIONAL OFFICE:

Motion by District 9 for a procedures manual and role delineation of job descriptions to be distributed to all of the Board of Directors by October 1, 1982. Seconded by District 1 and carried.

AMERICAN COLLEGE OF SPORTS MEDICINE: Motion by District 7, seconded by District 10 to endorse their program of Fun N'Fitness For All. Carried.

CONTINUING EDUCATION COMMITTEE: Motion by 8, seconded by 10 that the recommended Category D be changed as submitted in the report. Carried.

Motion by District 7, seconded by District 6 that Item 3, Section E be deleted. Carried.

Motion by District 1, severally seconded Item 4 that the recommended category heading read as submitted in the report. Carried.

Motion by District 9, seconded by District 10 that Item 5, recommended category J be changed to read as submitted in the report. Carried, with the word "program" added as the third word of the title.

Motion by District 8, seconded by District 6 that the recommended change in Category K be accepted as submitted in the report.

Motion by District 6, seconded by District 3, the recommendation that Category L be deleted be accepted. Carried.

Motion by District 7, seconded by District 6 that in Item 9, Category P be changed to read as submitted in the report. Carried.

XXXVIII PROFESSIONAL EDUCATION COMMITTEE:

Item 1, approving PEC official recognition be accepted as submitted in the report, motion to accept by District 4, seconded by District 5 and carried.

Item 2, to approve the guidelines as in the report for governing further development and implementation of the Athletic Training Major. Motion to accept as written made by District 4, seconded by District 1. Carried.

Item 5, recommended changes in the manual, "Guidelines for Development and Implementation of NATA Approved Undergraduate Athletic Training Education Program". Motion to accept made by District 4, seconded by District 6. Carried.

Item 6, recommendations re PEC Distinguished Athletic Training Educator Award. Motion to accept by District 5, seconded by District 10. Carried.

Items 7 and 8, resignations of Messrs. Sealey and Skeie. Motion to accept by District 6, seconded by District 7 and carried.

Item 9, reappointment of individuals. Motion by District 10 to table motion until the leadership of District 10 gets together and discusses the issue, seconded by District 9. Carried.

Item 10, approval of budget as submitted. Motion by District 4, seconded by District 1 to accept. Carried.

Item 11, approval of Athletic Training Education Programs of listed universities for a five-year period. Motion to accept by District 7, seconded by District 8. Carried.

They are as follows:

University of Arizona (graduate)
Indiana State University (graduate)
South Dakota State University (undergraduate)

Item 12, place listed Athletic Training Education Programs of universities on probation for a one-year period.

Indiana State University (undergraduate), moved by District 8, seconded by 7 and carried; 9-0-1 (District 4 Abstained).

University of Montana (undergraduate), moved by District 6, seconded by District 7 and carried.

Item 13, approve removal from probation on Athletic Training Education Programs at listed institutions. Motion to accept by District 4, seconded by District 6. Carried.

They are as follows:

California State University — Sacramento
Springfield College
Toledo University
Arizona State University
Brigham Young University
Bridgewater State College

Item 14, to approve withdrawal of NATA approval of Undergraduate Athletic Training Education Program at SUNY Brockport, for the listed reasons. So moved by District 2, seconded by District 9 and carried, 9-0-1 (District 4 Abstain).

Item 15, grant Initial approval of Athletic Training Education Programs at listed institutions for a period of five years. So moved by District 3, seconded by District 6. Carried.

They are as follows:
Old Dominion University (graduate)
James Madison University (undergraduate)
Kean College of New Jersey (undergraduate)

Item 16, resumption of printing and mailings of Athletic Training Job Vacancy announcement. Motion by District 4 to table until a later date, seconded by District 7. To be reconsidered during District reports. Motion carried to table.

Item 17, to approve PEC request for renaming of Continuing Education Workshop. In a previous discussion it was recommended that the following be added, "That the expenses and revenues go to PEC and it will become a committee budget item." Motion to approve with the addition made by District 4, seconded by District 5. Carried.

XXXIX REPORT OF THE BOARD OF CERTIFICATION:

Motion to approve for informational purposes by District 5, seconded by District 6. Carried.

XL NEW DISCRIMINATION POLICY:

A new Discrimination Policy, Policy 17, was recommended as follows: "The National Athletic Trainers Association will not discriminate against any individual on the basis of religion, sex, ethnic background or physical handicap". Motion to accept made by District 5, seconded by District 6. Carried.

XLI CONTINUATION OF PROFESSIONAL EDUCATION REPORT:

Item 9, recommendation previously tabled. Moved by District 9 to approve the Committee as recommended, seconded by District 7 and carried.

XLII LIAISON WITH AMERICAN COLLEGE OF SPORTS MEDICINE:

Moved by District 10 that NATA send a liaison representative to the American College of Sports Medicine from the area of their annual meeting. Motion seconded by District 6 and carried.

Motion by District 4, seconded by District 9 to accept the report for informational purposes. Carried.

Motion by District 3, seconded by District 9, that the NATA pay for two nights lodging, three days meals and travel for Ken Knight at the American College of Sports Medicine meeting in Montreal in 1983. Carried.

Motion was further amended by approval of the maker and seconder to read, "Limited to standard NATA per diem". Amendment accepted.

XLIII REPORT OF THE JOURNAL COMMITTEE:

Moved by District 5, seconded by District 7 that advertisement of the NATA Journal in other journals be tabled for one year. Carried.

Motion by District 4, seconded by District 5 to approve the budget of the Chairman of the Journal as submitted. Carried.

Motion by District 6, seconded by District 8 to approve the Committee members. Carried.

Motion by District 1, seconded by District 10 that the remaining portion of the Journal Report be received for informational purposes. Carried.

XLIV NATA FACULTY ATHLETIC TRAINER PROGRAM:

Motion by District 7, seconded by District 6 that the NATA Faculty Athletic Trainer Program will be discontinued at the end of the currently approved program (August 1983) with the provision that students presently enrolled will be allowed to finish but no new students may be added to the program. Carried.

XLV REPORT OF LIAISON REPRESENTATIVE TO THE COMMITTEE ON SPORTS MEDICINE OF THE AMERICAN ACADEMY OF PEDIATRICS:

Motion by District 2, seconded by District 10 to accept the report for informational purposes. Carried.

XLVI REPORT OF THE MEMBERSHIP COMMITTEE MEETING OF JUNE 14, 1982:

Motion by District 1, seconded by District 6 that the appeal case of Mark Hagenbaugh for eligibility for Associate membership be denied. Carried.

Changes in bylaws concerning membership.

Certified:

1.4.1 recommended to delete "and maintains continuous Certified membership". Delete "two". Delete "Revision of this paragraph approved June 19, 1979". Motion to accept made by District 3, seconded by District 6. Carried.

Associate:

2.1.2c recommended to be deleted. Motion to accept recommendation made by District 7, seconded by District 8. Carried.

Motion by District 7, seconded by District 1, that Mr. Melin investigate problems in District 7 concerning Associate membership and have a report by the Midwinter Meeting as to possible wording and effect. Carried.

2.1.3 recommended to be deleted. Motion by District 6, seconded by District 3 to delete. Carried.

2.2.0, 2.2.1, 2.2.2, 2.2.3 and 2.2.4 recommended to be deleted. Motion by District 8, seconded by District 4 for deletion. Carried.

Recommended that present (June 15, 1982) Associate members in good standing be allowed to continue membership in this class as long as he/she continues to pay dues and abides by the CEU requirement when it becomes effective. Motion to accept made by District 6, seconded by District 7. Carried.

Moved by District 8, seconded by District 7 to approve 2.0.0 through 2.1.2 b. Carried.

XLVII BYLAWS REVISIONS:

Section 1, Membership Classes, Student Code 4.

4.1.2 b eliminate the sentence, "Such hours must conform to the description of the character of supervised work hours indicated in the bylaws under "Membership", and also the paragraph concerning the transition period.

4.2.0, 4.2.1, 4.2.2, 4.2.3 and 4.2.4 to be deleted. Motion to accept recommendation made by District 4, seconded by District 5. Carried.

XLVIII MEMBERSHIP FORMS:

Mr. Melin requested approval of the general information called for in the form and that he and the National Office will endeavor to make the form as efficient as possible in achieving the information needed in accordance with the qualifications for membership. Motion to accept made by District 7, seconded by District 1 to accept the recommendations for changes and the details to be worked out between the Membership Committee Chairman and the National Office. Carried.

Motion by District 7, seconded by District 8 to approve the concept of the subject matter involved in the forms and the Membership Committee Chairman and the National Office to finalize it in acceptable form. Carried.

XLIX DUES:

Motion by District 6 to leave the dues as they are until there is a summary of cost of living submitted including all budget requests and the four items of inflation, computerization, Executive Director and Public Relations are submitted as to costs. Motion seconded by District 10 and carried.

L LONG RANGE PLANNING COMMITTEE:

Motion by District 9, seconded by District 8 to dissolve the Long Range Planning Committee and let the Board take over its duties. Carried.

LI ETHICS COMMITTEE:

Motion by District 8, seconded by District 6 to approve Mr. Chris Patrick as Chairman.

LII NATIONAL CONVENTION:

Motion by District 8, seconded by District 10 to exclude all exhibitors who sell wares at the convention. Carried.

LIII BUDGET REQUESTS:

Motion by District 6, seconded by District 5 that at future meetings all budget requests be acted upon at one time and this be in a form following the financial report form. Carried.

LIV DISTRICT REPORTS:

Motion by District 6, seconded by District 10 that all miscellaneous items be deleted from any budget request. Carried.

LV ADJOURNMENT:

There being no further business, the meeting of the Directors was at 4:15 a.m., Wednesday morning, June 16, 1982, declared to be adjourned.

PROCEEDINGS of the NATIONAL ATHLETIC TRAINERS ASSOCIATION

June 14, 1982
Seattle Center Playhouse
Seattle, Washington

1982 BUSINESS MEETING

BUSINESS MEETING
June 14, 1982

The National Business Meeting held at the 33rd Annual Meeting of the National Athletic Trainers Association convened at 11:15 o'clock, Monday morning, June 14, 1982, in the Seattle Center Playhouse, Seattle, Washington, with Mr. William H. Chambers, the President, presiding.

PRESIDENT CHAMBERS: I would like to call to order the 1982 National Athletic Trainers Business Meeting in Seattle, Washington.

Our first order of business is Ken Murray who will lead us in the Pledge of Allegiance and give our opening prayer.

... The audience arose and Mr. Kenneth Murray led the Pledge of Allegiance ...

MR. MURRAY: Dear Lord, we thank You this morning for the opportunities we have as individuals in the Trainers Association to come here to a beautiful city, to enjoy the nature that is around us.

We thank You for the opportunities we have as Trainers to serve mankind, to be able to help people and work with people. Always remind us that through You we gain our strength.

Be with us now in this meeting, help us to have clear minds and give the necessary things we all need. In Jesus Name we pray. Amen.

... The audience was seated ...

PRESIDENT CHAMBERS: Thank you, Ken.

The first order of business will be our Treasurer's report which will be given by Brooks McIntyre, the Accountant for the Association. Brooks.

MR. BROOKS McINTYRE: At the end of the 1982 fiscal year assets of the Association totaled $284,054. There were liabilities of $12,419, giving the organization an equity of net worth of $271,635.

The assets do not include the sum balance or equity of the grants and scholarships. It is our intention to include this in reports beginning with fiscal year 1983.

Our revenues for the year total $380,416 with expenditures or disbursements of $402,202.

As most of you know, additional disbursements were required for the establishment of the NATA Foundation, Inc., which was an entity set up to purchase and maintain the building purchased in Greenville, North Carolina, to house the National Headquarters. The net investment in the building is reflected under the "Other Assets" section of the balance sheet.

I should mention to you the building was purchased at somewhat of a bargain price. The purchase price per square foot was $16.80 from approximately comparable properties in the area selling for amounts in excess of $30 per square foot.

Bill, that is all I have.

PRESIDENT CHAMBERS: Thank you, Brooks.

Next will be the report of the Executive Director from the first Board Meeting. I would like to remind the membership to discuss any problems or questions with their respective District Director and any item which is to be brought before the Board of Directors has to be submitted to your District Director.

At this time the Executive Director of the NATA, Otho Davis.

MR. OTHO DAVIS: The following items were presented and considered for action taken at the first Board of Directors' Meeting at the Westin Hotel, Seattle, Washington, with Mr. William Chambers presiding as President.

PRESIDENT CHAMBERS: Thank you, Otho. The written minutes will appear in our Journal.

Next we have with us Mr. Al Ward, President of the National Football League Charities. He is here representing Commissioner Pete Rozelle of the National Football League and he has a presentation to make at this time.

MR. AL WARD: Thank you, Bill.

This is the fifth straight year that NFL Charities has come to your convention to pay our respects to the members, to the officers and to your scholarship program, which is something the NFL Charities strongly believes in. We feel like it makes our game safer, better and it is something we will continue to support well beyond this meeting.

So it is with a great deal of sincerity that I come before you and represent the directors of NFL Charities and the owners of the National Football League in presenting a check for $5,000 to Bill Chambers for your scholarship program and also to thank you for letting me come here.

... The check was presented to President Chambers ...

(Applause)

PRESIDENT CHAMBERS: Because of the fact that Commissioner Rozelle, Al Ward, Joe Rhein and other gentleman who are not here with us, have taken time from their busy schedule to come and present these awards, we do have some plaques we would like to present to Commissioner Pete Rozelle and also Al and Joe Rhein.

Al, we would like to present this to you in our appreciation for what the Charities have done for us and I would hope you would get the Commissioner's back to him and also Joe Rhein's.

... Presentation of plaques to Mr. Ward ...

(Applause)

PRESIDENT CHAMBERS: Next, our Special Committee reports. First off, the Memorial Resolution and this is presented by each District to be included in the official minutes and published in the Journal.

I would like to ask all of you to stand for a moment of silence for the members deceased this past year.

... The audience arose and observed a moment of silence ...

PRESIDENT CHAMBERS: We pray for all who have died that they may have a place in the Eternal Kingdom; Amen. Thank you.

PRESIDENT CHAMBERS: Next, George Sullivan, Chairman of the Awards Committee, will announce the Twenty-Five Year Award recipients, Honorary Award recipients and also the recipients of our Hall of Fame. This will be strictly an announcement and the formal presentation will be at our Honors Banquet tomorrow night. George.

MR. GEORGE SULLIVAN: Fellow Trainers, I would like to announce the following people for the Hall of Fame for tomorrow night when we will induct them.

From District 10 we have Francis Packy Boyle, deceased.

District 6, Robert "Bobby" Lane.

District 1, Mike Linkovich.

District 4, Leo Murphy.

District 8, Joseph Romo.

District 2, Bruce Vogelsong.

For the Twenty-Five Year Award, we have Ed Abramoski District 2; Vernon Eschenfelder, District 6; Irving Fountain, District 1; Bobby McClintock, District 6; Eugene Paszkiet from District 4; Joseph Quigley, District 2; Duane Stober from District 3 and Richard Waterman, District 1.

The gentlemen who will be going into our Honorary Membership will be Dr. James R. Andrews from District 9; Jim Cody from District 8; Dr. Arthur E. Ellison from District 1; Dr. William Ferguson from District 4; and Dr. Richard Gardner from District 10.

Thank you.

PRESIDENT CHAMBERS: Thank you, George.

Next we have a presentation to NATA. Jim Cody from Kwik Kold, which is a Division of Kay Laboratories has a check to present in honor of our President's Challenge Cup Award winner and this recipient will be announced and presented at the banquet tomorrow night. (Dr. Bill Combs, Purdue University was the recipient.) Jim.

MR. JIM CODY: Bill, it is with great pleasure that I, as well as those of Kay Laboratories, are able to present a check for $1,500 for the recipient of the President's Challenge Cup Award. We thank you.

... Presentation of check to President Chambers and applause ensued ...

PRESIDENT CHAMBERS: Next, Sara Paxton will announce the Trainer of the Year Award and she also has a presentation to make.

MS. SARA PAXTON: 1982 will be the seventh year of the Trainer of the Year Award and Nutrament/Drackett has been delighted amd proud to be your sponsor.

Each year we get to know more about you and the work that you do and each year we have been more convinced that our decision seven years ago to help promote awareness of your organization was indeed a good decision.

We are committed to sponsorship of this award and thank you for the privilege of working with you.

Each year the Trainer of the Year voting takes place in the fall and you should be receiving announcement and ballots for the 1982 award at the end of September. The award ceremony and presentation of plaques are video taped at the College Football Hall of Fame near Cincinnati and televised on a bowl game in December.

Five thousand dollars will be awarded in scholar-

ship money, $1,000 to each school represented and $2,000 to the NATA Scholarship Fund in honor of the professional Division winner.

At this time I would like to formally recognize this year's winners before the convention.

The High School Trainer of the Year is from New Albany, Indiana. Since the ballots go to your headquarters to be counted, it is not true that he won because he and I are both from the State of Indiana and graduates of Ball State University. He has become famous for raising funds from among his citizens of New Albany to build one of the finest training rooms in the nation. Your High School winner is Glen Snow. (Applause)

In the Junior College Division the recipient is well known to you. Over the years we have gotten to know him pretty well, too. We found him so confident, so capable and so likeable, we can certainly understand why you elected him your President for four years and voted him this award. Originally from Alabama, a graduate of the University of Missouri and Head Trainer at Fullerton Junior College since 1961, he is your outgoing President, Bill Chambers. (Applause)

Last year you remember I told you Otho almost did not make it to the awards ceremony on time. This year the person I had to worry about was your College Division winner. He almost did not make it because it seems they had an awful lot of clouds in Beaumont, Texas, and he just could not get off the ground.

Those of you who know him know he always has his feet on the ground. A graduate of the University of Texas at El Paso, newly elected to your Board of Directors, a Trainer for twenty-one years and Head Trainer at Lamar University since 1971. At Lamar they call him "Our Mr. Zeek." Will you stand up, Paul Zeek. (Applause)

Before I met the recipient of your Professional Division Award, I did not know you could have your business suits tailored in a western style. Of course, being from the back woods of Indiana, I also did not know that the ultimate in fashionable footwear was snakeskin boots with big green eagles embroidered on them. (Laughter and applause)

Seriously, though, we have come to know and respect this gentleman as another fine leader in your organization. A Texan, graduate of Lamar University and Kent State University, a Trainer for twenty-seven years, Head Trainer of the Philadelphia Eagles, surprise Hall of Fame inductee in 1981, he is your Executive Director, Otho Davis. (Applause)

And Bill would like to present to you this check for the Scholarship Fund.

... Presentation of check and applause ensued ...

PRESIDENT CHAMBERS: Thank you, Sara.

Next we have Paul Grace, the Chairman of the Certification Committee who will come up and announce the winner of the Eddie Wojecki Scholarship Award which is sponsored by Mueller Company.

MR. PAUL GRACE: The winner of the Eddie Wojecki Scholarship Award for 1982 is Lesley Rogan from Ohio University, District 4. (Applause)

PRESIDENT CHAMBERS: Next from the University of Virginia and our liaison to the American Orthopaedic Society for Sports Medicine to announce the winner of that scholarship, Joe.

MR. JOE GIECK: The winner this year for the American Orthopaedic Society for Sports Medicine which also gives a grant to the NATA, is Otho Davis. (Applause)

PRESIDENT CHAMBERS: Pinky Newell, the Chairman of our NATA Scholarship Committee will come forth and announce the winners of our NATA Scholarship Awards which were presented last night at our Student Trainer Banquet.

MR. PINKY NEWELL: These are the 1982 Scholarship Award winners and I would like to read them and ask that their names be included in the minutes.

The Eddie Wojecki 1982 Achievement Award, Lesley Rogan, Ohio University. Sponsor of the Award, Mueller Chemical Company.

The Undergraduate Scholarship Award, Wayne Rodriguez, Bridgewater State College. Sponsor of the Award, the National Football League Charities.

Sandra Janine Shultz, California State University, Fullerton. Sponsor of the Award, National Basketball Trainers Association.

The Robert H. Gunn Scholarship Award, Duane Lloyd Wieding, Southwest Texas State University. Sponsor, National Athletic Trainers Association.

The Sayers J. Miller, Jr., Scholarship Award, Leslie Paul Sewall, Northeastern University Boston-Bouve College. Sponsor, National Athletic Trainers Association.

The Chuck Cramer Scholarship Award, Gary Lee Harrelson, University of Southern Mississippi. Sponsor, Cramer Products, Incorporated.

Frank Cramer Scholarship Award, Warren David Franke, East Carolina University. Sponsor, Cramer Products, Incorporated.

The William F.X. Linskey Scholarship Award, Karen J. Freeman, Canisius College. Sponsor, Johnson and Johnson.

The William E. Newell Scholarship Award, Jeannie B. McCormick-Hayden, Washington State University. Sponsor, Chattanooga Pharmaceutical Company.

The Post Graduate Scholarship Awards, Dale Frank Blair, Central Washinton University. Sponsor of the Award, National Football League Charities.

Robert Huston Cochrane, Jr., Bowling Green State University. Sponsor, National Basketball Trainers Association.

The Otho Davis Post Graduate Scholarship Award, Kenneth Floyd Brown, Jr., University of North Carolina at Charlotte. Sponsor, National Athletic Trainers Association.

The Del C. Humphrey Post Graduate Scholarship Award, Suzanne Leigh Powelstock, Lock Haven State College. Sponsor of the Award, Schutt Manufacturing Company.

G.E. "Moose" Detty Post Graduate Scholarship Award, Michael Anthony Ramaeker, University of Wisconsin, La Crosse. Sponsor of the Award, P.R.O. Orthopedic Devices, Inc.

Good-Smith Post Graduate Scholarship Award, Jamy Ann Nuttall, South Dakota State University. Sponsor of the Award, School Health Supply Company.

The Naseby Rhinehart Undergraduate Scholarship Award, Don Gleason, University of Montana. Sponsor, NATA District 10.

Living Memorial Scholarships Undergraduate Award, Janet Beth Putzier, Ohio University. Sponsored by the NATA District 4.

Living Memorial Post Graduate Award, Glenn Rodney Brickey, Indiana State University. Sponsor of the Award, NATA District 4.

Thank you, Mr. Chairman. (Applause)

PRESIDENT CHAMBERS: Thank you, Pinky.

I would like to recognize the 1981 Board of Directors.

District 1, Jack Baynes.
District 2, Dick Malacrea.
District 3, Andy Clawson.
District 4, Bob Behnke.
District 5, Frank Randall.
District 6, Cash Birdwell.
District 7, Dale Mildenberger.
District 8, Roger Dennis.
District 9, Bobby Barton.
District 10, Gary Craner.

I would like for all of you to give these men a round of applause for the work they have done. (Applause)

We have five men who will be coming onto the Board of Directors. At this time I would like as I call their names, I would like for them to stand so you can see who they are in case you do not know.

District 2, Hal Biggs.
District 3, Hunter Smith.
District 6, Paul Zeek.
District 9, Roy Don Wilson.
District 10, Mark Smaha.

These are the five new Directors who will be coming onto the Board starting with tomorrow morning's meeting.

Our next order of business, our Executive Director will announce the sites of the District Meetings and also he will present the individual awards and recognize those who have put on our Annual Meeting and Conference Symposium.

MR. DAVIS: The District Meetings are printed in your Program Directory. However, on page 2, Districts 1 and 2 meetings will be at Mercer I and II. Seattle Center.

District 3, your meeting will be at Mercer III, Seattle Center. All of these are in the Seattle Center.

District 4, Nisqually, North Court.
District 5, Mercer IV.
District 6, Snoquamie, North Court.
District 7, Shaw, North Court.
District 8, The Playhouse.
District 9, Mercer VI.
District 10, Mercer V.

At this time we would like to recognize the local committee from Seattle who have done such a super job in putting this convention on. Dennis Sealey has worked his tail off. You have no idea the many, many things he has done for you and the long hours of time and hard work he has put into this convention, Dennis, would you come forward, please. (Applause)

"Presented to Dennis Sealey in appreciation of outstanding contributions to the National Athletic Trainers Association, Annual Meeting and Clinical Symposium, Seattle, 1982." Dennis, we thank you.

... Presentation of plaque to Mr. Sealey ...

MR. DENNIS SEALEY: I do not have much to say. I would really again welcome everyone to Seattle. I hope you have a good time and enjoy the meeting. That is the important thing, if we can continue educating our members. Enjoy our city.

Again, thank you for being here. Without the NATA this all would not be possible. (Applause) Plaques were also presented to: Rick Griffin, Wayne Rasmussen, Jim Whitesel, Rick Hall, Lynda Griffith, Tammy Kiehn, Bob Grams, Joe Reiter, Frank Furtado.

MR. DAVIS: We have a gentleman who has been involved in the Association from day one. He just retired or resigned as our Chairman of our Ethics Committee. Is "Tow" Diehm here today? (Absent)

Anyway, there is an award here to Tow Diehm.

"To Tow Diehm, in grateful appreciation for your guidance and contributions as Chairman of the NATA Ethics Committee."

We will present this to Tow at a later time. Let's have a round of applause for Tow. (Applause)

Is Phil Donley here today? Phil Donley has long served our Professional Education Committee and this will also be presented to Phil at a later time. (Applause)

There are some individuals we wish to recognize who have served us on our Certification Committee. Mike Cappeto, Russ Miller, Bob Williams, Mike, on behalf of the Association we wish to present this to you for your many hours and your great contribution you made to our Board of Certification and Certification Committee.

... Presentation was made to Mr. Cappeto ...

MR. CAPPETO: Thank you very much. I enjoyed it a great deal and I hope some of you have a chance to attend some of the interesting soccer games I have over the years. (Laughter)

MR. DAVIS: Russ Miller. Russ, we appreciate it.

... Presentation was made to Mr. Miller ...

MR. RUSSELL MILLER: Thank you and thanks to all of you for the help in the past and continue to help with the certification exam. I think we all realize how important that is to all of us in helping people recognize who we are and what we do. Thanks to the very beginners and now to Paul Grace for the fine job they are doing. (Applause)

MR. DAVIS: Is Susan Anthony here today? (Absent)

Bob Williams. Bob, on behalf of the Association, thank you.

MR. WILLIAMS: I cannot repeat what has already been said. Thank you. (Applause)

MR. DAVIS: Will Andy Clawson come forward, please.

"Presented to Andy Clawson in recognition for outstanding services as Director of District 3 of NATA." Andy, we thank you!

... Presentation was made to Mr. Clawson ...

MR. DAVIS: Andy was our Vice President for the past year.

Paul, would you come forward and accept Cash Birdwell's plaque for him. This goes to Cash Bird-

well, outgoing Director of District 6.

... Presentation of plaque to Mr. Zeek for Mr. Birdwell ...

MR. DAVIS: Bobby Barton as the outgoing Director of District 9, coming into more problems than he ever thought he would realize.

... Presentation of plaque to Mr. Barton ...

MR. DAVIS: Gary Craner, District 10.

... Presentation of plaque to Mr. Craner ...

PRESIDENT CHAMBERS: We want to thank those people who have contributed to our Association, and because our Association is so great is that we have people working.

I have a few remarks I would like to make before I introduce you to your new President.

The first time I stood before you as your President was at our National Business Meeting in Las Vegas. I asked you, the membership, to have faith in your elected Officers, in our Association and most of all in yourselves.

Henry Ward Beecher once wrote, "We should so live and labor in our time that what came to us as seed may go to the next generation as blossom, and what came to us as blossom may go to them as fruit. This is what we mean by progress."

This past year we made progress in many areas and this progress was due to the faith our membership had for NATA that I asked for in Las Vegas.

As some of you know, NATA was presented the Presidential Citation by The American School and Community Safety Association. This was presented to us for our continuous efforts on behalf of the health and safety of athletes. All of us should be proud that we have been recognized and given this honor.

This fall or early next year, we will realize a goal that a short time ago really did not seem realistic. Thanks to the work of and faith of several people we will gain membership in the National Commission for Health Certifying Agencies. This membership will give additional status for our certifying procedures.

Late this summer we are going to have a permanent display at the College Football Hall of Fame in Kings Island, Ohio. This display will utilize computers to answer questions about NATA and our profession. The funds for this were provided by our friends at the Drackett Company.

Perhaps the most gratifying thing that occurred this past year was when I received a phone call from one of our members concerning the possibility of leaving half of his estate to our Grants and Scholarships Committee. This very generous gesture will probably amount to over $250,000. Their faith and belief in our Association are the reasons Dick and Concetta Vandervoort have put this in their will and I am very grateful that they want to help the future students in athletic training in this way.

The surface has only been scratched as far as our progress is concerned. I hope each of you will continue to be loyal to and supportive of NATA.

In King Lear, Act One, Scene Four, William Shakespeare wrote "How sharper than a serpent's tooth it is to have a thankless child."

With this in mind, I want to finish up by saying thanks to some people that have meant so much to me throughout my career and particularly these past four years.

To the late Ken Rawlinson, thanks for the patience, guidance and discipline. All of this would not have been possible without what he gave me.

To those of you that have served as Board Members, District Secretaries, Committee Chairpersons, Committee Members — thanks for your dedicated efforts in making NATA so great.

A humble thanks to Roger Dennis, Bick Harmon and Leon Skeie. These three Southern California friends have always been around when I needed help and were always willing to do what I asked them to do.

My Athletic Director, Hal Sherbeck, has been supportive of not only me but also our profession. The help and extra work of my assoicate, Wendy Scobell, allowed me to spend the time needed to serve you. I am thankful for the help and support these two people gave me.

To my family within the profession, Larry Gardner, Jerry Rhea, Fred Schwake and Roy Don Wilson, thanks for your support and for giving me the needed laughter during the periods of frustration.

The people that kept me going in the right direction were Mary Edgerley and the Sweethearts of NATA at our National Office in Greenville. I am thankful for the help they gave me but I am thankful for what they have done and continue to do for NATA.

Last and certainly not the least, I want to say thanks to Otho Davis for what he has done and what he does for NATA. It has been great working with this man. Recently on a CBS Sports Special, Reggie Jackson was asked what he felt a hero was. He answered by saying that, "A hero is someone that makes a contribution to mankind — someone that makes man-kind better." To me, this statement exemplifies Otho Davis and he will always be a hero to me, especially when it comes to NATA.

Thanks to each of you for giving me the opportunity and privilege of serving as your President. I have enjoyed every minute of it.

Every time there is an end to something there is always a new beginning. That new beginning for NATA is today as Bobby Barton begins to serve as President of our Association.

I hope and pray that you will give him the same support you have given me and I think it is important that each of us keep in mind the 37th and 38th verses of the 6th Chapter of Luke. It goes like this:

"Do not judge, and you will not be judged.
Do not condemn, and you will not be condemned.
Forgive and you will be forgiven.
Give and you will receive.
The measure you give is the measure you will receive."

At this time I would like to have Bobby Barton, the Kentucky Colonel, Eastern Kentucky University, come forth and I would like to present him with a gavel, which is traditional, and Bobby, I might say that there are going to be times when you will wish this thing were a sledge hammer.

... Gavel was presented to incoming President Barton as the audience arose and applauded ...

PRESIDENT CHAMBERS: Also I want to present a patch that has the National Athletic Trainers Association on there. I will stick it on there, Bobby, and you can put it where you want it. I have been very proud to wear this patch and Bobby, I am sure you are going to wear this with just as much pride and dignity as I have tried to.

... The patch was presented to incoming President Barton and applause ensued ...

PRESIDENT CHAMBERS: Your new President Bobby Barton. (Applause)

... Mr. Bobby Barton assumed the Chair as President ...

PRESIDENT BARTON: Thank you very much, Mr. Chambers. As has happened in the past, you did confuse me. You said you enjoyed every minute of it and then you gave me a sledge hammer. I do not really quite understand that analogy.

President Chambers, the Board of Directors, Fellow Officers and Fellow Trainers: It is certainly a pleasure and an honor and privilege to be inducted into this office. As I reflect back upon my tenure as a Director and Board Member, great advances have been made by Mr. Chambers during his Presidency. It has been a great learning experience for me and the other Board Members, too, I believe will concur with that. We can all be proud of the contributions made by Dick Malacrea, Andy Clawson, Cash Birdwell, Gary Craner as well as the present and past veterans on the Board of Directors. You have to be there to appreciate the work that has been done.

With a new President and five new Board Members, we start up tomorrow morning and our appearance and posture will certainly change to some degree. I only hope two years from now we can look back and say that the next two years will have been as progressive as the last two.

I sincerely believe our centralizing the National Office, the office delineation study and the licensure efforts, due to both Bill Chambers, Frank George and particularly Bob Behnke are great strides to make us a more understood profession in the outside world.

Before coming to Seattle, I spent a month preparing a very long speech. The day I got here, our Committee Chairman, Dennis Sealey stole it. He put it on the front page of the paper, "Trainers' Revival, But Jobs Are Scarce." As I go into this office I hope I never go through a day without remembering that I think that is our most important charge.

I cannot express the thanks to my District and I cannot express my thanks to the Board of Directors enough for the support of me in coming into this office. Needless to say there is work to be done and I certainly am looking forward to it.

I had the opportunity to attend the Districts 1 and 2 meetings already and so I may not make it around to yours today, but I sincerely hope to make it to the others. I will look forward to meeting those of you I have not had the opportunity to meet.

I would ask that you be patient. I would ask that you be supportive of both the new President and the new Board of Directors.

When I look back at the size of the Board Meeting the books we carried to Seattle and compared them to the size of our materials we were carrying about six years ago, I am well aware progress is being made.

I consider this a great professional honor and look forward to working with all of you.

As many of you know, there were many changes proposed to our Consitution. They were mailed out to the entire membership. We do not have a quorum here today so they may not be acted upon.

At this time before adjourning, I would like to give an invitation to anyone who would like to bring new business to our attention. I would ask that you introduce yourself, give your name, place of employment and District.

I do not see anybody. For that reason I would entertain a motion to adjourn this business meeting.

MR. DON LOWE (Syracuse University): I so move to adjourn.

MR. DEAN WEBER (University of Arkansas): I second the motion.

PRESIDENT BARTON: The motion has been made and seconded. All those in favor please say aye; opposed? Thank you very much.

... Whereupon, the meeting was adjourned at 12:20 o'clock p.m. ...

National Athletic Trainers Association Approved Athletic Training Education Programs

Programs listed here are approved by the National Athletic Trainers Association. For detailed information, write to the program director whose name is given in parentheses in the listing. Two basic plans of education for athletic training are listed according to the following key:

(1) Undergraduate Athletic Training Education Programs
(2) Graduate Athletic Training Education Programs

ARIZONA

UNIVERSITY OF ARIZONA (2)
Department of Physical Education
Tucson, Arizona 85721 (Gary Delforge)

ARIZONA STATE UNIVERSITY (1)
Department of Health, Physical Education & Recreation
Tempe, Arizona 85281 (Michelle Piette)

CALIFORNIA

CALIFORNIA STATE UNIVERSITY, FULLERTON (1)
Department of Health, Physical Education & Recreation
Fullerton, California 92634 (Jerry Lloyd)

CALIFORNIA STATE UNIVERSITY, LONG BEACH (1)
Department of Physical Education
Long Beach, California 90840 (Keith Freesemann)

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE (1)
Department of Physical Education & Athletics
Northridge, California 91324 (Dale Rudd, Acting Director)

CALIFORNIA STATE UNIVERSITY, SACRAMENTO (1)
Department of Athletics and Sport
Sacramento, California 95819 (Doris Fennessy)

DELAWARE

UNIVERSITY OF DELAWARE (1)
Department of Physical Education & Athletics
Newark, Delaware 19711 (Roy Rylander)

IDAHO

BOISE STATE UNIVERSITY (1)
Department of Physical Education
Boise, Idaho 83725 (Ron Pfeiffer)

ILLINOIS

EASTERN ILLINOIS UNIVERSITY (1)
School of Health, Physical Education & Recreation
Charleston, Illinois 61920 (Dennis Aten)

ILLINOIS STATE UNIVERSITY (2)
Department of Health, Physical Education & Dance
Normal, Illinois 61761 (William Kauth)

SOUTHERN ILLINOIS UNIVERSITY (1)
127 Davies Gym
Carbondale, Illinois 62901 (Sally Rouse Perkins)

UNIVERSITY OF ILLINOIS (1)
Department of Physical Education
Urbana, Illinois 61801 (Gerald Bell)

WESTERN ILLINOIS UNIVERSITY (1)
College of Health, Physical Education & Recreation
Macomb, Illinois 61455 (Larry J. Leverenz)

INDIANA

BALL STATE UNIVERSITY (1)
Department of Men's Physical Education
Muncie, Indiana 47306 (Mary E. O'Carroll)

INDIANA UNIVERSITY (1,2)
School of Health, Physical Education & Recreation
Bloomington, Indiana 47401 (John Schrader)

INDIANA STATE UNIVERSITY (1,2)
School of Health, Physical Education & Recreation
Terre Haute, Indiana 47809 (Kenneth Knight/Graduate)
(Catherine Grove — Undergraduate)

PURDUE UNIVERSITY (1)
Department of Physical Education, Health, & Recreation Studies
West Lafayette, Indiana 47907 (Dennis Miller)

IOWA

UNIVERSITY OF IOWA (1)
Department of Physical Education for Men
Iowa City, Iowa 52242 (Dan Foster)

KENTUCKY

EASTERN KENTUCKY UNIVERSITY
College of Health, Physical Education, Recreation & Athletics
Richmond, Kentucky 40475 (Robert M. Barton)

LOUISIANA

LOUISIANA STATE UNIVERSITY (1)
Department of Health, Physical Education & Recreation
Baton Rouge, Louisiana 70803 (Marty Broussard)

MASSACHUSETTS

BRIDGEWATER STATE COLLEGE (1)
Department of Physical Education
Bridgewater, Massachusetts 02324 (Marcia Anderson)

NORTHEASTERN UNIVERSITY (1)
Department of Physical Education
Boston, Massachusetts 02115 (Kerkor Kassabian)

SPRINGFIELD COLLEGE (1)
Division of Health, Physical Education & Recreation
Springfield, Massachusetts 01109 (Sherrod W. Shaw)

MICHIGAN

CENTRAL MICHIGAN UNIVERSITY (1)
Physical Education Department
Mount Pleasant, Michigan 48859 (Ron Sendre)

GRAND VALLEY STATE COLLEGE (1)
Department of Physical Education & Recreation
Allendale, Michigan 49401 (Doug Woods)

WESTERN MICHIGAN UNIVERSITY (2)
Department of Health, Physical Education & Recreation
Kalamazoo, Michigan 49009 (Jack Jones)

MINNESOTA

MANKATO STATE UNIVERSITY (1)
Physical Education Department
Mankato, Minnesota 56001 (Gordon Graham)

MISSISSIPPI

UNIVERSITY OF SOUTHERN MISSISIPPI (1)
Department of Athletic Administration & Coaching
Hattiesburg, Mississippi 39401 (James B. Gallaspy)

MISSOURI

SOUTHWEST MISSOURI STATE UNIVERSITY (1)
Hammons Student Center
901 S. National
Springfield, Missouri 65802 (Ivan Milton or Gary Ward)

MONTANA

UNIVERSITY OF MONTANA (1)
Department of Health & Physical Education
Missoula, Montana 59801 (Russ Cagle)

NEBRASKA

UNIVERSITY OF NEBRASKA (1)
University Health Center
Lincoln, Nebraska 68588 (Roland E. LaRue)

NEVADA

UNIVERSITY OF NEVADA — LAS VEGAS (1)
Department of Physical Education
Las Vegas, Nevada 89119 (Leo Milan)

NEW JERSEY

KEAN COLLEGE OF NEW JERSEY (1)
Department of Physical Education
Union, New Jersey 07083 (Iris Kimura)

WILLIAM PATTERSON COLLEGE OF NEW JERSEY (1)
Department of Movement Sciences and Leisure Studies
Wayne, New Jersey 07470 (Tobias Barboza)

NEW MEXICO

UNIVERSITY OF NEW MEXICO (1)
Department of Health, Physical Education & Recreation
Albuquerque, New Mexico 87131 (L.F. Diehm)

NEW YORK

CANISIUS COLLEGE (1)
Department of Physical Education
Buffalo, New York 14208 (Peter Koehneke)

STATE UNIVERSITY COLLEGE AT CORTLAND (1)
Division of Health, Physical Education & Recreation
Cortland, New York 13045 (John Sciera)

ITHACA COLLEGE (1)
Department of Health, Physical Education & Recreation
Ithaca, New York 14850 (Marsha Grant)

NORTH CAROLINA

APPALACHIAN STATE UNIVERSITY (1)
Department of Health, Physical Education & Recreation
Boone, North Carolina 28608 (Ron Kanoy)

EAST CAROLINA UNIVERSITY (1)
Department of Health, Physical Education, Recreation & Safety
Greenville, North Carolina 27834 (Rod Compton)

MARS HILL COLLEGE (1)
Physical Education Department
Mars Hill, North Carolina 27854 (John Wells)

UNIVERSITY OF NORTH CAROLINA (2)
Department of Physical Education
Chapel Hill, North Carolina 27514 (William Prentice)

NORTH DAKOTA

NORTH DAKOTA STATE UNIVERSITY (1)
Department of Health, Physical Education, Recreation & Athletics
Fargo, North Dakota 58102 (Denis Isrow)

UNIVERSITY OF NORTH DAKOTA (1)
Department of Health, Physical Education & Recreation
Grand Forks, North Dakota 58201 (A.G. Edwards)

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Oxford, Ohio 45056 (Patricia Troesch)

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Slippery Rock, Pennsylvania 16057 (James R. Pennell)

WEST CHESTER STATE COLLEGE (1)
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School of Health Sciences
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Beaumont, Texas 77710 (Paul Zeek)

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Nacogdoches, Texas 79562 (Sandy Miller)

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Forth Worth, Texas 76129 (Ross Bailey)

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Intercollegiate Athletics & Physical Education
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5th Annual NATA Student Writing Contest

In an effort to promote scholarship among young athletic trainers, the National Athletic Trainers Association sponsors an annual writing contest.

1. This contest is open to all undergraduate student members of the NATA.

2. Papers must be on a topic germane to the profession of athletic training and can be case reports, literature reviews, experimental reports, analysis of training room techniques, etc.

3. Entries must not have been published, nor be under consideration for publication by any journal.

4. The winning entry will receive a $100.00 cash prize and be published in *Athletic Training* with recognition as the winning entry in the Annual Student Writing Contest. One or more other entries may be given honorable mention status.

5. Entries must be written in journal manuscript form and adhere to all regulations set forth in the "Guide to Contributors" section of this issue of *Athletic Training*. It is suggested that before starting students read: Knight KL: Writing articles for the journal. *Athletic Training* 13:196-198, 1978. NOTE: A reprint of this article, along with other helpful hints, can be obtained by writing to the Writing Contest Committee Chairman at the address below.

6. Entries must be received by May 1. Announcement of the winner will be made at the Annual Convention and Clinical Symposium in June.

7. The Writing Contest Committee reserves the right to make no awards if in their opinion none of the entries is of sufficient quality to merit recognition.

8. An original and two copies must be received at the following address by May 1, 1983. **NATA Student Writing Contest, c/o Clint Thompson, Jenison Gym, Michigan State University, East Lansing, MI 48824.**

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The Computer in Sports Medicine

Ron Ribaric, ATC

Within the past few years the Micro Computer has made its way into small business and even home use. It will be only a matter of time before most training rooms have a Micro Computer.

There are many companies that offer Micro Computers. Apple, Texas Instruments, Radio Shack, and IBM are only a few of the companies in the market. When looking to purchase the equipment cost and needs should be considered. List your needs and see which unit will fill these needs. Also consider the possibility of growth, you may need to expand. This would require your unit to accept additions.

What is needed? Certain components are required for a Micro Computer:

1) Central Processing Unit — This is the brains of the computer. This is the part that looks like a typewriter.

2) Disc Drives or Cassette Tape Recorder — This is where the data is stored for further use.

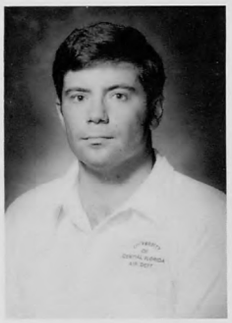
3) Monitor — A special television without a channel selector. This allows you to see what is being typed into the computer.

4) Printer — The printer enables the computer to give you a hard copy of the data on the storage discs.

These are the parts needed for a basic set up in Sports Medicine.

Costs for a Micro Computer vary depending on the pieces of equipment purchased. For $3000-5000 you should be able to obtain a good unit with the capability to add on.

There are various languages that are available. Basic, Logo, Pascal, and Machine are some of the languages available. Most Micro Computers have Basic language capacity. This is what is suggested for a computer in Sports Medicine. Most units offer a tutorial textbook that you can use to self-teach programming. You do not need to have extensive classes in programming to be able to program a Micro Computer. If you do not wish to do your own programming, you can purchase pre-programmed discs such as Apple's DB Master. The DB Master should have all the data needed for Sports Medicine. The DB Master cost is in the $200-250 range. Obtaining this type of pre-programmed information will save you a great deal of time.



Mr. Ribaric is the Head Athletic Trainer at the University of Central Florida, Orlando, FL 32816

The uses of the Micro Computer in Sports Medicine are varied. Basically, you can do just about any data storage that you need. For the purpose of this paper, the Apple II Computer will be discussed as this is the unit I use.

We have been using the computer for 3 years for our insurance coverage. We store all the names, addresses, phone numbers, and type of injury needed. Also we have the ability to store each bill and payments. We also can receive a total of expenses and breakdown on the types of injuries by sport. All the data can be printed out as needed.

Physical examination information is also stored in the computer. We have the ability to obtain such items as athlete's and parent's addresses, Social Security numbers, list by sport as to who has completed the physical and any special medical problems that are of a concern.

Treatment and injury tallies are kept in the computer. These can be broken down by week, month, or year and by sport, type of treatment, or type of injury. This saves our staff a great deal of time.

Budget and inventory data can be easily stored and updated. This gives you an up-to-date read out of all items. The major help is in reordering. The items can be stored and printed out ready to submit for purchasing.

Payroll (workstudy) and scholarship data of our students is stored in the computer. This helps us maintain a closer account of what we have spent.

Addresses can be stored for print-out onto labels. We have our current staff, alumni, recruits, workshop participants, and a high school mailing list. All these can be printed as needed.

Workshop data such as schedules, budget, staff, and rosters may also be printed. The computer can also be programmed to print out the number of schedules needed. For example, the schedule can be reprinted for 50 copies.

These are some of the areas in which we use the Micro Computer. There are many other uses that we have not yet discovered. In my opinion, the Micro Computer will be a time saver for our program.

It is relatively easy to program the computer using the DB Master from Apple. The first step is to list your data that you want stored. This is then transferred onto a screen format layout sheet. The layout sheet allows you to put data in so that it will not go beyond the margins of the screen. Once this is complete, the computer will give you the instructions to follow to place this information on the data disc. After this is done, the specific information is added. The program usually does not have to be tampered with. You now have your data stored.

The next step is to obtain hard copy from the stored data. To do this, a print program worksheet is developed. This allows you to program the computer to print out only the specific information you require. The data stored may contain 20 items of information, you may only need 5 items. The computer also has the ability to store more than one group of these items for future use. The worksheet help to keep the data within the margins.

The Micro Computer is part of our society and will be a common place item in Sports Medicine. +

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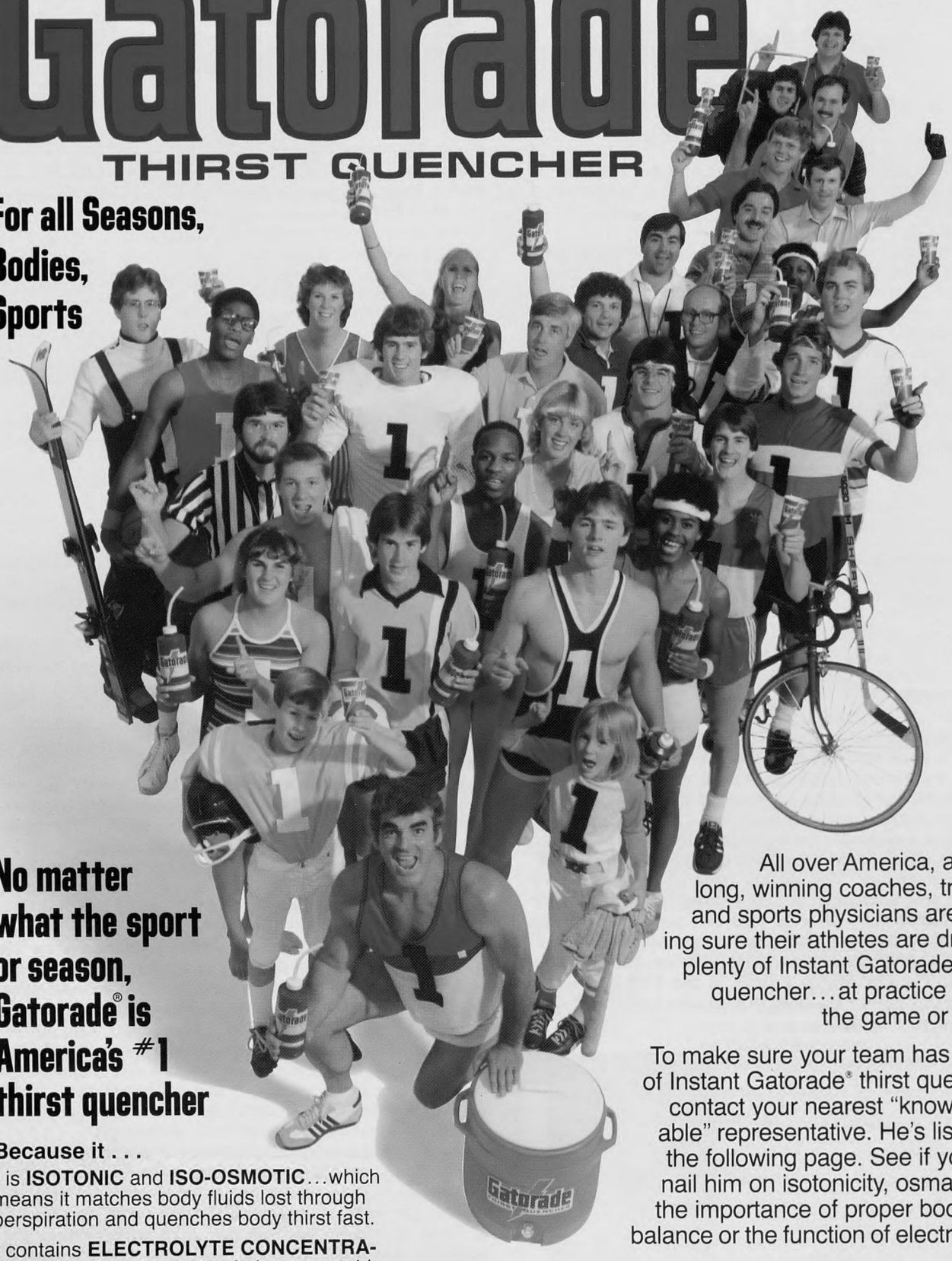

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