

ATHLETIC TRAINING



THE JOURNAL OF THE NATIONAL ATHLETIC TRAINERS ASSOCIATION, INC.

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IN THIS ISSUE:

- Legal Duties & Liability in Athletic Training
- Stress Fractures
- Salt Replacement by Natural Methods

**36th ANNUAL MEETING
SAN ANTONIO, TEXAS,
JUNE 7 THRU 11, 1985**
See pages 8 and 9

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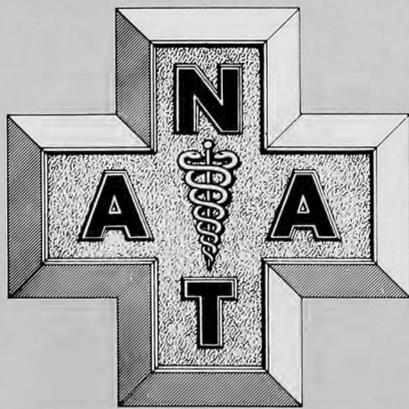
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ATHLETIC TRAINING

THE JOURNAL OF
THE NATIONAL ATHLETIC TRAINERS ASSOCIATION, INC.

Volume 20, Number 1, Spring 1985

Features

- | | |
|----|--|
| 10 | <p style="text-align: right;">CEU Quiz</p> <p>Legal Duties & Liability in Athletic Training
JOHN N. DROWATZKY</p> |
| 16 | <p style="text-align: right;">Stress Fractures
LYNN M. CONLEY</p> <p>The Utilization of Athletic Trainer/Team Physician Services and High School Football Injuries
DANIEL T. LACKLAND
JAMES M. TESTOR
PAUL C. AKERS, MD
ISAO HIRATA, JR., MD
ROLAND M. KNIGHT
J. LORIN MASON</p> |
| 20 | <p style="text-align: right;">Salt Replacement by Natural Methods
MARTIN A. HERKER</p> <p style="text-align: right;">A Clinical Study of Topical 10% Triethanolamine Salicylate Cream for Relief of Postexercise Muscle Pain
VIRGINIA POLITINO
SARAH L. SMITH
WILLIAM C. WAGGONER</p> |
| 25 | <p style="text-align: right;">CASE REPORT
Cervical Orthosis for Football
JENNIFER DIX
GARY R. HANNA</p> |
| 29 | <p style="text-align: right;">CASE REPORT
Fracture of the Scapula in a Professional Football Player
M. I. CULPEPPER
J. M. ROBERTS</p> |
| 33 | <p style="text-align: right;">33</p> |
| 35 | <p style="text-align: right;">35</p> |

Departments

- | | | | |
|----|-------------------------------------|----|--------------------------------|
| 67 | Abstracts | 49 | Memorials |
| 69 | Announcements | 38 | Notes from the National Office |
| 41 | Association Activities | 69 | New Products |
| 71 | Book Reviews | 63 | Potpourri |
| 59 | Calendar of Events | 6 | President's Message |
| 43 | Editorial (Endodontics) | 74 | Question - Answer |
| 7 | Editor's Comments | 65 | Student Trainer Corner |
| 76 | Guide to Contributors/
Deadlines | | |

President's Message



Dear NATA Members:

In January I was invited to a meeting sponsored by the American Medical Association, concerning the misuse and testing of drugs in the athlete. As you are all aware this is presently a national concern of all allied health personnel. Although I am confident that our members have handled themselves extremely well in this area, I would like to remind you that your procedures are being scrutinized more closely than ever before. The entire American Medical Association is concerned about the problems associated with drug abuse and wants the input of our membership.

Paul Grace and myself were invited to "Who Speaks for Sports Medicine" sponsored by AAHPER&D. The main focus of this group is the upcoming **1985 Sports Medicine Congress/Exposition** to be held in Indianapolis. NATA, Inc. will have an exhibit at this meeting and our membership is encouraged to attend.

Many positive comments have been made to us concerning the recent release of **Athletic Training and Sports Medicine**. Our members and the members of the American Academy of Orthopaedic Surgeons can be very proud of this joint venture.

The Mid-Year Meeting of the Board of Directors was held in San Antonio, Texas, February 10 & 11. We devoted a great deal of time and effort to a public relations program that seems to meet the needs of our growing profession. Your Directors will be explaining the program at your next district meeting. After devoting an entire year studying our options, I strongly believe that our membership will be very pleased with our future direction.

You should soon be receiving housing information for the Annual Meeting and Clinical Symposium for 1985 which will be hosted by District Six and held in San Antonio, Texas. Please make note of the different dates and remember that our meeting will officially begin on Saturday instead of the usual Sunday. Our Arkansas/Texas delegation has done a magnificent job of planning this event. I hope that each of you will be able to attend.

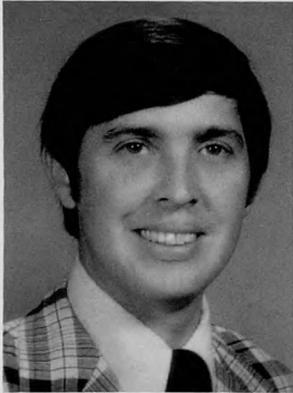
Best Wishes for a prosperous New Year.

Sincerely,

A handwritten signature in cursive script that reads "Bobby".

Bobby Barton, ATC

Editor's Comments



Steve Yates, ATC, M.Ed.
Wake Forest University
Winston-Salem, NC 27109

Appreciation . . .

I would like to take this opportunity to thank the membership for all the favorable responses to the Winter issue dedicated to Mr. William E. "Pinky" Newell. I feel the newer members now have a greater understanding of what this man meant and did to promote the National Athletic Trainers Association.

Student Trainers . . .

Deloss Brubaker reports a need for participation with regard to the Student Trainer Corner and Student Writing Contest. This is "your" forum. Please respond.

Future Tentative Convention Sites . . .

1985	San Antonio, Texas
1986	Las Vegas, Nevada
1987	Columbus, Ohio
1988	Washington, D.C.
1989	Fort Worth, Texas
1990	Indianapolis, Indiana
1991	Houston, Texas
1992	San Diego, California

Guidelines . . .

Please "reference in alpha order" your contributions to be printed in the Journal. This will expedite running the Index into the computer at the National Office. I also remind contributors that material of announcement or promotion nature should be submitted "camera-ready."

Make Plans . . .

August 6-10, 1985: 1985 Sports Medicine Congress/Exposition — "The Impact of Injury on Sport and Exercise", Indianapolis, Indiana. For more information, contact Mr. Thomas Miller, Sports Medicine Congress, P.O. Box 55095, Madison, WI 53705-8895, (608) 231-3480.

New Year . . .

Another new year has been granted to us in this fraternity of caring, listening and treating our fellowman — this profession known as athletic training/sports-medicine. I trust that we will view each day with our best effort, knowing that satisfaction will be forthcoming.

SY(SSSA)+

Certificate and Plaque Order Form For NATA Certified Athletic Trainers

The Board of Certification is offering a new graphically designed certificate printed in Old English Script with gold embossed NATA logo and seal of certification. Each certificate is professionally personalized with the athletic trainer's name, certification number, and date of certification. The certificate may be purchased on a 12" x 6" hardwood plaque protected by plexiglass, or ordered as the certificate of Certification only.

Please indicate below which of these two alternatives would better suit you:

_____ I wish to order the plaque mounted certificate for the price of \$35.00 each.

_____ I wish to order the certificate of Certification for the price of \$10.00 each.

Enclose this order form with a check or money order in payment for the plaque or certificate and mail to the following address:

NATA BOARD OF CERTIFICATION
Post Office Drawer 1865
Greenville, North Carolina 27834

Use a permanent street mailing address. No post office boxes please. Delivery will be by United Parcel Service.

NAME _____
(as you wish it to appear on the certificate)

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Certification Number _____

Certification Date _____

San Antonio

June 7 thru 11

TOWER OF AMERICAS



ENTERTAINMENT SCHEDULE (Tentative) SAN ANTONIO, TEXAS - JUNE 1985

Friday, June 7

Evening
(time unknown
at press time)

Denver Broncos Party - Marriott
Golf Tournament

Saturday, June 8

7:00 - 11:00 P.M.

Mission Pharmaceutical Company Party - Lone Star Brewery

Sunday, June 9

7:00 - 8:30 P.M.
(time unknown
at press time)

NFL Cocktail Party - Hyatt
"Fun Run"

Monday, June 10

6:30 - 7:30 P.M.
7:30 - 9:00 P.M.

J&J Cocktail Party - Marriott
Annual Awards Banquet - Convention Center
Country & Western Apparel
Dance - Convention Center

TENTATIVE SPOUSES' PROGRAM

- Sunday morning - Aerobics - Marriott
- Monday Morning - Aerobics - Marriott
- Monday (time unknown) - Home Emergencies: "What To Do When The Trainer's Not Home"
- Tuesday morning - Aerobics - Marriott

SOME TYPE OF BABYSITTING SERVICE WILL BE AVAILABLE

PREVIEW: San Antonio, An Original City

San Antonio is a city where remnants of a colorful past are juxtaposed with the energy of an even more exciting future. Located in the heart of Texas, it is a city of almost one million people with a vivid cultural heritage spanning more than 250 years.

A city set firmly in the Sunbelt, San Antonio has definitely prospered from its careful planning, rich Mexican heritage and many gifts of nature.

On a stroll through downtown, one can discover many of the sites for which San Antonio has become famous — the Riverwalk, also called the Paseo del Rio; La Villita (the Little Village); El Mercado (the Mexican marketplace); and HemisFair Plaza.

Also nestled in the heart of the downtown area is the Alamo, where over one hundred eighty brave men fought and died in the name of Texas Independence. This popular visitor's spot carries memories of famous men who were legends in their own time, including Davy Crockett, Jim Bowie and William Travis. Here began one of the most heroic and dramatic battles in history.

The San Antonio River, one of the most exceptional tourist spots in the world, meanders its way through the downtown business district, twenty feet below street level. Lined with a lush, subtropical terrain, this deep green waterway is the center of its own community. While strolling along the cobblestone paths, one can find an array of European-style sidewalk cafes, specialty boutiques, showy nightclubs and restaurants of international cuisine.

With an average annual temperature of 68.8 degrees and 300 days a year of clear, blue skies, San Antonio is perfect for year-round river tours aboard open-air barges or self-powered paddleboats. Groups can float down the river, dining aboard candlelit barges, enjoying the

sights and sounds of the River.

While walking along the banks of the River, one can visit La Villita, an original San Antonio settlement. Local artists not only sell their wares in restored historic stone houses located there, but also demonstrate their crafts for spectators.

Once on the street level, open-air wooden trolleys or horse-drawn carriages are available for touring downtown. One of the city's well-known downtown sites is HemisFair Plaza, home of the 1968 World's Fair and location of the 750-foot Tower of the Americas. From the revolving restaurant or the observation deck at the summit of the Tower, one can see the city spread beneath as it gradually fades into the Texas Hill Country.

The choices of places to see and things to do in San Antonio are many. Visitors can spend a quiet afternoon touring the new San Antonio Museum of Art and in the evening catch an exciting Broadway show. A cool, clear morning can be spent at San Antonio's internationally famous zoo followed by a short walk to the nearby Oriental-style Sunken Gardens. Or one can step back into Texas history at the Witte Museum which houses the Museum of Natural History and archaeological exhibits. Later catch a glimpse of the 27 different ethnic cultures represented at the Institute of Texas Cultures located on HemisFair Plaza.

The city's close proximity to Mexico is most evident at El Mercado, San Antonio's bustling Mexican marketplace. The cobblestone pedestrian mall is complete with arts and crafts shops, clothing boutiques, jewelry stores, restaurants and a farmer's market — all with a "south of the border" flavor. Sounds of traditional Mexican mariachi or other musical groups can most always be heard as one dines on a Mexican food found only in San Antonio. The enchiladas, tacos, tamales and tortillas

prepared here have become world famous for their unique flavor and fine quality.

South of the city near the San Antonio River are historic eighteenth century Spanish missions. Established by Franciscan Friars, the four missions are still active churches. An inspiring mariachi mass is celebrated each Sunday at San Jose Mission. San Jose is the largest and most elaborate of San Antonio's missions but each of the four has its own charm.

History buffs especially can enjoy the elegant King William Historical District. The stately, restored Victorian mansions were built in the late 1800s by wealthy German merchants.

The city's hotels and motels reflect the various cultures and lifestyles represented in San Antonio. Architectural styles even vary, ranging from the very large and modern to the quaint and historic Spanish mode. And bellmen, taxi drivers and all service personnel alike are exemplary of the city's southwestern graciousness and warmth, eager to tell about the city of which they are so proud.

For the sports-minded, the city boasts beautiful golf courses and tennis facilities which are easily accessible to hotels, jogging trails along the River Walk and horseback riding in Brackenridge Park. And one can join in the contagious merriment and not-too-genteel whooping and hollering at one of the NBA Spurs basketball games or USFL Gunslingers football games. Or one can visit the prestigious Retama Polo Center, a spectacular facility that is easily the largest polo center in the United States.

San Antonio has the advantages of a major city, the diversity of many cities, and the originality of only one city. It is a truly charming place of history and tradition, carefully blended with cosmopolitan progress. See you there!

1985 NATA, INC. CONVENTION

TENTATIVE SCHEDULE 1985 NATA, INC. CLINICAL SYMPOSIUM & WORKSHOP MARRIOTT HOTEL, SAN ANTONIO, TEXAS JUNE 8-11, 1985

Saturday, June 8

9:00-12:00 Noon
2:00- 5:00 P.M.
3:00- 6:00 P.M.

Pre-Convention Workshops
Schering Symposium
Visit Exhibits

Sunday, June 9

8:30- 8:45 A.M.

Banquet Hall #1

Welcome
B. Barton, President, NATA
Mayor of San Antonio
Paul Zeek, District Director
Bernie LaReau, Host Trainer

Mission Room

Room #31

8:45- 9:30 A.M.

Jean Edwards Holt, MD
"Athletic Injuries of the
Eye and Orbit"

John Richards, MD
Knee Braces: Their Function
"Support or Prevention"

Jerry Julian, MD
"Overuse Syndromes
in Women"

9:30-10:00 A.M.

Visit Exhibits

10:00-11:00 A.M.

Billy Pickard, ATC
Keynote Address

11:00- 1:00 P.M.

National Business Meeting

1:00- 2:00 P.M.

Lunch

2:00- 2:30 P.M.

Ty Goletz, MD
"Anterior Cruciate Ligament
Repair/Reconstruction"

Ron Carroll, ATC
"Athletic Improvement
Through Body Composition,
Evaluation and Analysis"

2:00- 3:00 P.M.

2:30- 3:00 P.M.

Philip D. Manfredi, MD
"Injuries to the Head, Chest
and Abdomen"

2:00-3:30 P.M.

Dental Group Panel
"Update on Mouthguards"
Robert Morrow, DDS
Richard Seals, DDS
William Kuebker, DDS

3:00- 3:30 P.M.

Jesse Delee, MD
"Elbow Injuries in Sports"

Dean Weber, ATC
"You Can Do More For
the Injured Athlete
Than You Think You
Can"

3:30- 4:00 P.M.

Visit Exhibits

4:00- 4:30 P.M.

Jack Henry, MD
"Myositis Ossificans"

George Young, ATC
"Implementing a Computerized
Injury Reporting System"

Kenwyn "Peanuts" Boyer,
ATC
"Anaphylactic Reactions
in Athletics"

4:30 P.M.

District Meetings

Monday, June 10th

8:30- 9:00 A.M.

Ted Edwards, MD
"An Overview of Fluid Replacment
and Fluid Balance for Athletes"

8:30-10:00 A.M.

Bill Nemeth, MD
John Faggard, MD
Tim Kirschner, ATC
"Update on Knee Treatment
Rehabilitation"

9:00- 9:30 A.M.

Ron Scott, ATC
"Thigh Contusions and Their
Treatment"

9:30-10:00 A.M.

Greg Rauer, ATC
"The Trainer's Role in Evaluation,
Treatment and Rehabilitation of an
Acutely Sprained Ankle"

10:00-10:30 A.M.

Visit Exhibits

10:30-11:00 A.M.

Warren Morris, ATC
"Drug Testing at the
University of Georgia"

Kaye Wilkins, MD
"Current Controversies in
Youth Sports"

Susan Leeper, ATC
"Treatment of the
Female Athlete"

11:00-11:45 A.M.

Kenneth Blum, PhD
"Natural vs. Drug Induced
Healing in Sports Medicine"
Lunch

Maurice Johnson, PhD
"The Role of the Abdominal
Muscles in Injury Prevention"

Gilbert Tamez, ATC
"Management of Student
Trainers in High School"

11:45- 1:30 P.M.

1:30- 2:30 P.M.

David Green, MD
"It's Just a Sprain"
and Judy McGee,
Hand Therapist

Bill Nemeth, MD
"Drug Abuse in
Athletics"

2:30- 3:00 P.M.

John Krusenklau, RPT
"Rehabilitation Modalities"

Jill Gass, ATC
"Use of Eccentric Muscle
Contraction in the
Treatment of Chronic
Tendonitis"

3:00- 3:30 P.M.

Visit Exhibits

3:30- 4:00 P.M.

Keith Markey, MD
"The Use of Orthotics in
Athletics"

Robert Donnelly, DDS
"Mouth and Face Injuries
in Athletics"

4:00- 4:30 P.M.

Lawrence Czelusta, RPT and
Podiatrist
"Resistive Aerobic Plyometers"

Steve Birkhardt, MD
"The San Antonio
Gunslingers - The First
Year"

Tuesday, June 11

9:00- 9:30 A.M.

Banquet Hall #1

Melvin Thornton, MD — "Thermoregularity Problems in the Athlete"

9:30-10:00 A.M.

Joe Tippett, MD — "Arthroscopic Evaluation and Treatment of the Acute Knee"

10:00-10:15 A.M.

Break — No Exhibits

10:15-10:45 A.M.

Skip Cox, ATC — "Cybex Evaluation for Prevention"

10:45-11:15 A.M.

Fred Curley, MD — "Brachial Plexus Injuries"

11:15-11:45 A.M.

1986 Site Presentation



RIVER WALK



ALAMO



MARIACHI'S



CONVENTION CENTER

CEU Credit Quiz

Legal Duties and Liability in Athletic Training

John N. Drowatzky, JD, EdD

Along with the growing field of athletic training are the increased risks of legal conflict. The rules governing the status of trainers may vary from state to state, however, the dominating base is derived from the duty of an athletic trainer which . . . "consists of implementing prevention-of-injury programs and immediate treatment and rehabilitation procedures for the injured athlete as directed by the team physician". The areas of athlete preparation, treatment of injuries, rehabilitation, record keeping, and physician coverage are reviewed to better remind those involved of the risks that in the past have caused conflicts to people in sports medicine. The majority of legal problems relating to athletic training are due to claims of negligence. Using reasonable care and understanding one's own limitations is the beginning of attempting to protect oneself against liability.

While the practice of medicine has been around for many years, the specialized area of sport medicine and related professions, including athletic training, is relatively new. Consequently, as is true for any rapidly developing field, the legal issues are also being developed. The status and duties of a physician or a practitioner in a limited aspect of medicine, such as a chiropractor, are rather well defined. However, until recently athletic trainers were only present in professional teams and colleges and universities. In this earlier situation trainers had a limited impact on the overall sports picture. With the growth of sports participation and the increased knowledge about training, conditioning and treatment of athletic injuries, athletic trainers have become present at all sports participation levels. In some cases the high school coach serves a dual role as athletic trainer and coach while in others a full time trainer is present. Because of this recent change in

the number and nature of athletic trainers it is difficult to locate case law specifically relating to athletic training and other sport medicine personnel so the information in this article is based on the legal principles that usually apply to occupations with similar responsibilities.

Athletic Trainers

An athletic trainer is defined by the National Athletic Trainers Association (NATA) as an allied health professional who has fulfilled the requirements for certification as established by the NATA Board of Certification. The Certified Athletic Trainer works under the direction of a licensed physician when practicing the art and science of Athletic Training, which includes the following domains: 1) Prevention of Athletic Injuries; 2) Recognition and Evaluation of Athletic Injuries; 3) Management, Treatment and Disposition of Athletic Injuries; 4) Rehabilitation of Athletic Injuries; 5) Organization and Administration of an Athletic Training Program; and 6) Education and Counseling of Athletes (1).

According to a Careers Placement publication, the athletic trainer's duties . . . "consist of implementing prevention-of-injury programs and immediate treatment and rehabilitation procedures for the injured athlete as directed by the team physician" (2). While these statements by the NATA regarding the duties and preparation of athletic trainers are quite definitive, the status of athletic trainers can vary considerably from state to state as statutory regulations may either be present in differing forms or nonexistent. Consequently, the athletic trainer should make sure what types of tasks can be legally performed and which may be prohibited.



Dr. Drowatzky is Professor of Exercise Science and Physical Education at The University of Toledo, a member of the Ohio Bar and has served as an expert witness in several sports injury cases.

Legal Duties Defined

The overall legal duty which is imposed on all professionals is that they must use due care to prevent an unreasonable risk of injury to others. Thus, in the case of the athletic trainer, the legal issue is usually that of negligence. According to Torts (Second), the standards for negligence are as follows (3):

Section 284 - Negligent Conduct: Act or Failure to Act. Negligent conduct may be either: (a) An act which the actor as a reasonable man should recognize as involving an unreasonable risk of causing an invasion of an interest of another, or (b) A failure to do an act which is necessary for the protection or assistance of another and which the actor is under a duty to do.

Section 299A - Undertaking in Profession or Trade. Unless he represents that he has greater or less skill or knowledge, one who undertakes to render services in the practice of a profession or trade is required to so exercise the skill and knowledge normally possessed by members of that profession or trade in good standing in similar communities.

Looking at the legal duties in terms of the job description provided earlier by the NATA, three areas merit consideration: immediate treatment of injuries, rehabilitation and supervision of treatment, and prevention-of-injury programs.

Treatment of Injuries

In the case of injuries to participants or others, the legal duty is that of preventing further injury or harm to the injured party. Thus, the first step to be performed and minimize your liability is to assess the types of injuries that may occur and to make reasonable plans to deal with them. The plans should include the facilities and emergency equipment necessary to handle the injuries that are foreseeable during that activity. For example, if broken bones are a foreseeable possibility, splints should be available during the activity.

The second step is to make sure that all personnel are trained in first aid and appropriate emergency procedures. Coaches have been found liable for their failure to have and use adequate first aid training (4). Coaches should have special knowledge about the particular types of problems that may face them. Football coaches, in particular, should know the signs and procedures relating to heat disorders, as one example. Nonmedical personnel should not attempt a procedure that is classified as medical or they will be held to the standard of care used for physicians. For example, a biology professor supervising a project involving the taking of blood samples was held to the level of care imposed on physicians when he was tried for negligence. There is no reason to believe otherwise than athletic trainers performing medical tasks would be held to the standard of care applied to physicians performing the same task. Furthermore, state laws usually describe what may be considered as the practice of medicine or other state controlled professions and so you should not perform tasks specifically designated as medical or those that are outside your profession by statute.

To summarize, athletic trainers and coaches in charge of the sports activity have the following legal duties with regard to injuries suffered in connection with that activity. First, they have a duty to provide or secure reasonable medical assistance to the injured party as soon as possible under the circumstances. Second, if such medical assistance is not immediately available, the duty of care will require that the injured party be

transported to a place where medical care can be provided as soon as is reasonably possible. There is an added requirement that the injured party be properly cared for until medical assistance can be rendered in this circumstance (4, 5). Thus, proper first aid, proper handling and availability of necessary first aid equipment are all required in order to meet these duties. At least one court has defined reasonable medical assistance as the provision of reasonable facilities and equipment as well as persons with the necessary degree of skill and experience (5). If the athletic trainer or coach in charge performs unnecessary or detrimental acts they will in all probability be found liable for failure to use due care under the law of negligence (6).

Preparation of Athletes

As indicated above, another part of the athletic trainer's job is that of preparation for athletic contests. Several different tasks have been assigned to athletic trainers relating to this part of the job. The trainer may be involved in administering screening tests such as evaluating flexibility, strength and other abilities related to safe participation in sports. He may be responsible for receiving and evaluating the medical examination screening forms completed by the physicians. In some institutions the athletic trainer is responsible for developing the physical conditioning program used to develop physical fitness. While involved with sports that are conducted in places having high temperature and high humidity conditions, he may be designated as the person who monitors the environmental conditions to determine if practice must be modified or cancelled. During such adverse environmental conditions, he often has the responsibility to supervise the pre- and post-practice weighing of players to determine water loss and supervise water intake during practice. Thus, the trainer is involved in the prevention of heat disorders in athletes. The same duty applies to the athletic trainer during the performance of these tasks as would apply to coaches; he must exercise due care to avoid subjecting others to an unreasonable risk of injury.

Rehabilitation

When the athlete experiences an injury, the athletic trainer is expected to determine if medical assistance is required and if so, to make sure that the athlete receives the medical treatment. After the injury has been treated by the physician, the trainer is expected to supervise the rehabilitation program and perform taping or other supportive assistance as necessary. The rehabilitation program may involve the use of exercise and physical activity or it may involve the use of such modalities as cold and heat. In the case of rehabilitation for injuries, the athletic trainer is subject to the same duties as other persons performing similar tasks; to use reasonable care to prevent further injury. It is important, therefore, to know the characteristics and safety considerations relating to the equipment and techniques used during the rehabilitation process.

A search of the case law surrounding the liability of athletic trainers did not disclose any pertinent case law relating to the above duties as most situations reaching the courts involved either coaches and/or physicians. The current lack of cases probably exists because in most high school situations the coach also serves as an athletic trainer and it has been easier to sue him in the coaching role without an attempt to separate the two roles. There have been several state and national attempts to legislate that athletic trainers are required to be present at sporting events, but to date these

attempts have been generally unsuccessful. If such laws should be passed or when athletic trainers become more visible and plentiful, the case law relating to the athletic training profession will also become more widespread. In the interim, the best practice is to make sure you have adequate and up-to-date training in first aid and athletic training procedures, that you do not perform activities that exceed the scope of athletic training, that you exercise due care to prevent injuries from occurring, and when they do happen, that you exercise due care to prevent making the situation worse. You should also carry an up-to-date insurance policy to protect you financially in case a law suit does occur.

Record Keeping

Record keeping is not necessarily a legal duty but athletic trainers should pay attention to their records. Adequate records can help you perform your duties with regard to proper preparation and rehabilitation of athletes as well as serve to show you have exercised reasonable care if you become involved in a law suit. Keep your records on file, especially in the case of injuries. All medical records are confidential and should not be released without the athlete's written permission. Likewise, Federal law makes all academic and personal files confidential and subject to the same requirements (7). If an athlete wishes that his records be sent to a professional team or another person, the athlete should sign a release before the records are sent and be informed that once those records are released the school has no control over the manner in which the other party will use the records. The athlete must be made aware that his cause may be either helped or hurt by the release of the records. Make sure that an accident form is completed for all injuries, describing the type and extent of injury, how it occurred and what action was taken to treat the injury. These forms should be completed when the staff is injured also, as they may be necessary in the case of workman's compensation claims. Record keeping is an important way in which you can show how the prevention, treatment and rehabilitation aspects of your job are completed.

Physicians

Because athletic trainers generally work under the direction of a physician, some knowledge of the legal duties that apply to a physician can be helpful. The brief description of the legal duties relating to the practice of medicine is followed by suggestions of ways to improve the relationship existing between the physician and the athletic trainer.

Extensive case law has evolved surrounding the legal duties that apply to physicians. These duties include the following: (1) to act with utmost good faith toward the patients; (2) to advise the patient about the effectiveness of the treatment being considered; (3) to refer the patient to a more successful treatment if such a treatment exists; (4) to perform a proper diagnosis; (5) to exercise due care during the treatment of the patients; and (6) to insure continuity of treatment for the patients (8).

During the years, several approaches have been used to determine the standard of care expected of physicians. The most frequently used standard of care is that the physician is under a duty to employ those practices that a reasonably competent member of the profession practicing in the same specialty would be expected to do in order to conform to the approved professional practice. In the case of practitioners in either the specialties or allied health care fields, the courts have generally held such individuals to the professional standards of other

similarly situated members of the specialty or field in which they practice (8).

Physicians and Sports

Successful accomplishment of several duties of the physician when serving as a team physician requires the assistance of the coach, athletic trainer or other school officials. For example, the physician's first duty is to the adequate care of the patient, not to the team, the coach or school. He should not return the player to participation until the player is medically able to participate without further risk. Dick Butkus received a large out of court settlement because the team physician was also a part owner of the team which he played for as a professional. According to Mr. Butkus, he was returned to action before his knees were medically ready and this limited his playing career. Consequently, if the physician does not permit participation, accept the situation and act accordingly to provide continuity of treatment, the coach or trainer may have to supervise the athletes. In many high schools volunteer physicians serve as team doctors at the games. If an injury occurs and the doctor requests that the injured player see his personal physician the next day, the coach or trainer should make sure that the player follows through with this direction. The follow-up visit is necessary for continuity of treatment and the coach or athletic trainer may be found negligent if they let the player participate when they know or should have known that the player required further examination. You are responsible for considering and taking into account any conditions in your players that you either have knowledge of or reasonably should have knowledge of.

In the legal system, the concept of medical malpractice has evolved to represent the system of loss allocation that is based, for the most part, on the fault of the defendant physician. Malpractice results from conduct below the level that society allows with impunity rather than the mere fact that a patient has suffered a health-impairing experience during the course of a medical procedure (8). Generally, whenever a physician undertakes to render care to a person, a professional relationship between the physician and that person is established and a corresponding duty of care to the patient is created as described above. In the team physician role, any liability that arises from the physician-patient relationship is a problem for the physician rather than the schools; however, exceptions to this general rule do arise.

As an example, in *Welch v. Dunsmuir Joint Union High School District* (9), a high school quarterback sustained an injury following which he was unable to get to his feet. When his coach arrived, he was able to move his hands at his coach's direction. The injured player was then carried to the sidelines by his teammates with no supervision given to the manner in which he was transported. When the injured player arrived at the sidelines, he was unable to move either his hands or his feet. Although a physician was in attendance during this period of time it was not clear whether he examined the player on the field or only at the sidelines. In any event, the boy was rendered a permanent quadriplegic by these events and brought suit against the school, the coach and the doctor. Testimony during the trial established that the spinal cord was not severed at the time of the injury since he could move his hands and that the severance could only have occurred when he was being carried from the field. The jury issued a verdict against all defendants. The negligence of the doctor was apparently his failure to treat the athlete

immediately on the field and instruct the others as to how the injured player should be carried from the field. The school officials and the coach were negligent because they did not follow appropriate transport and first aid procedures.

The point this case emphasizes is that the athletic department personnel should develop procedures that will minimize the potential for situations like that described above to develop. Communication between trainers, coaches and physicians is a must. Adequate training must include emergency first aid procedures. Appropriate equipment to deal with injuries must be provided by the schools during practice and games.

Recommended Procedures

The following suggestions should be implemented to facilitate the use of team physicians in the athletic program and reduce your potential for liability from negligent acts and omissions.

1. Regardless of the status of your team physician, volunteer or paid, complete and execute a written contract or agreement so all parties understand each other's responsibilities.

2. Make sure what equipment the school is responsible for providing and what equipment will be supplied by the physician. With regard to the equipment supplied by the school, keep an up to date inventory and a record of when the shelf life of the item has lapsed and its replacement is necessary.

3. Establish procedures for the appropriate transfer of persons needing medical attention beyond that which is within the capabilities of your school situation.

4. Develop job descriptions for all personnel associated with athletic programs: coaches, equipment supply personnel, nurses, athletic trainers, student managers and physicians.

5. Keep records! Fill out accident reports, keep training and medical records, document your "follow-up" procedures. The physician who renders emergency care is not required to attend the patient once the injured player has been referred to the player's family physician or to hospital emergency personnel and that fact has been communicated to the patient or his parents. If your player is to see his family physician before returning to practice or class, make sure that the player followed these directions. Usually the relationship between the team physician and the injured athlete is not a permanent one and the athletic trainer or coach may be negligent if they do not follow-up on the athlete's behavior.

6. Make sure that the proper screening occurred during the preseason physical examination. In some states only doctors of medicine or osteopathy can certify fitness for athletic participation. The objective of the medical examination should be to discover problems in paired organs, occult sites, mental and physical retardation and innocuous defects or other abnormalities that may present problems. School personnel, particularly athletic trainers, should inspect the completed medical examination form to make sure that all of the examination requirements were met and be aware of any conditions that might exist in the athletes (10). Chiropractors and other practitioners of limited medical professions often desire to sign the medical approval forms. Before accepting such an approval form signed by a limited practitioner, make sure that person can legally complete the required aspects of the examination and has in fact done so. Do not accept partially completed medical examinations. If the practitioner should insist that you do so, either get an opinion from

your state's attorney general (and keep it on file) or let them bring suit so the courts can settle the issue.

Summary

The purpose of this article was to describe the legal duties of athletic trainers and coaches when preparing athletes for participation, when faced with an injured player during either practice or competition and when providing rehabilitation from injury. The case law relating to athletic training in these circumstances is almost nonexistent, however, the duties and standard of care that apply can be determined from the law of negligence. Generally, athletic trainers must use reasonable care to secure medical treatment for injured players and use reasonable care to prevent further injury until such medical care is provided for the injured player. They must also provide reasonable screening, conditioning, rehabilitative and supportive activities for the athletes under their supervision to prevent any undue risk of harm. Finally, coaches and athletic trainers must be aware of the legal duties of physicians and facilitate the successful accomplishment of these duties. Suggestions were made as to how this facilitation can be accomplished. The case law relating to athletic trainers is sure to develop as the number and role of trainers increases in the future. Be sure to make the legal aspect of athletic training a part of your continuing education along with information about new techniques, equipment and treatments. Finally, keep good records to show that you have made reasonable efforts to meet your legal duties and keep your professional insurance up to date. Remember, you are required to act in a reasonable, responsible manner using your skill and knowledge appropriately. You are not required to insure that no injuries occur.

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LEGAL DUTIES AND LIABILITY IN ATHLETIC TRAINING

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Questions

	a	b	c	d	e
1. Ultrasound may be used by an athletic trainer engaged in the rehabilitation of an injured athlete. a. True b. False					
2. Which of the following personnel working with athletes should be trained in first aid and appropriate emergency procedures? a. coaches b. athletic trainers c. both a and b above d. neither of the above					
3. Legally athletic trainers performing a medical task in an emergency situation are not liable for injury to the athlete as a result of this act. a. True b. False					
4. The athletic trainer's responsibilities with respect to preparation of athletes for competition may include a. evaluating the athlete's strength and flexibility b. evaluating the medical examination screening forms completed by physicians c. developing the physical conditioning program used to develop physical fitness d. b and c above e. all of the above					
5. Which of the following statements is/are true regarding the athletic trainer's record keeping? a. athletic trainers are legally required to keep records of athletic injuries b. records should be kept of the athlete's preparation c. written permission must be given by the athlete if records are to be sent to an interested party d. b and c above e. all of the above					
6. It is the coaches' or athletic trainers' responsibility to see that an athlete follows up on a physician's recommendation. a. True b. False					

	a	b	c	d	e
7. Medical malpractice results from a. conduct below the level that society allows with impunity b. a patient experiencing a health-impairing experience during the course of a medical procedure					
8. In the team physician role, any liability that arises from the physician-patient relationship is generally a problem for the school. a. True b. False					
9. The objective of the preseason physical examination for the athlete should be to discover problems in 1. paired organs 2. occult sites 3. intelligence 4. physical development a. 1,2,3 b. 1,3 c. 2,4 d. 4 only e. 1,2,3,4					
10. Medical approval forms for athletic competition may be signed by a chiropractor in any state in the United States. a. True b. False					

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STRESS FRACTURES

Lynn M. Conley, MA, ATC

In recent years the frequency of diagnosed stress fractures has been increasing, perhaps due to greater participation by the general public and/or positive detection, both clinically and radiologically, with increased utilization of radionuclide bone scans. In the past stress fractures could only be detected after the healing phase began. Conventional roentgenograms may be normal, when stress is present, for three reasons: 1) appearance of reactive bone formation is usually delayed from three weeks to three months after the development of symptoms; 2) reactive bone formation and fracture may be present, but not identified because the reactive bone was tangential and the fracture line not perpendicular to the x-ray; 3) the wrong area was examined roentgenographically because of referred pain. The new method using 99mTc -phosphate has shown positive bone scans within the first few days of the initial clinical findings. The compound works by accumulating in the area of high bone blood flow and metabolic activity which the radiograph could not. Early diagnosis means early treatment, thus returning the athlete sooner to competition.

A stress fracture is defined as a partial or complete fracture of bone due to the inability to withstand non-violent stress that is applied in a rhythmic subthreshold manner (12). In contrast to traumatic fractures which occur abruptly at the time of injury and are associated with loss of structural continuity, stress fractures develop over a period of days and weeks and in the early stages are not usually associated with a visible fracture nor do they show displacement or changes in bone alignment. Originally described in the lower extremities of military recruits during World War 1, the term "march fracture" was coined to describe the fracture of the metatarsal shaft that was caused, not by acute injury, but by repeated stress (13). Stress fractures have now been found to occur throughout the skeletal system in a wide range of individuals from ballet dancers and long distance runners to weekend athletes and joggers. The diagnosis of a stress fracture by physicians is increasing in frequency. This increase can be related to several factors: earlier detection both clinically and radiologically with increased utilization of radionuclide bone scans, or an increase in fractures due to greater athletic participation by the general public.

Clinical Diagnosis

The classical history of stress fracture is the onset of pain with new or vigorous activity. The pain is often



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aggravated by continued activity and relieved by rest (3,6). The onset of pain is usually insidious and the relationship to the chronic trauma is often overlooked. The clinical examination will usually demonstrate point tenderness of the bone at the site of the stress fracture. Localized swelling in the area of the stress fracture may or may not be present. Pain, point tenderness, and swelling can occur in other over-use syndromes such as arthritis, musculotendinous injuries, and ischemic disorders have lead to interpretive errors. Stress fractures have been misdiagnosed as traumatic inflammatory or malignant bone (cellulitis, thrombophlebitis, soft tissue hematomas, osteomyelitis, and osteosarcomas) (5,11).

Radiologic Diagnosis

Radiographic confirmation of a clinically suspected stress fracture has classically involved the recognition of the healing phase (i.e. medullary sclerosis or periosteal new bone formation). In the past, confirmation of stress fractures has been delayed until roentgenograms showed abnormality, usually not radiographically visible until two or three weeks after the stress fracture has occurred (2,6). Most initial radiographs are normal and the reliance of this modality leads to a high number of false negatives. (see Figures 1 thru 6) Figure 1 was diagnosed on February 22, 1984 as being a normal right leg. On March 6, 1984 the same leg was diagnosed as having a slight thickening of the medial tibial cortex indication some periosteal reaction of the distal third of the tibia. On April 5, 1984 this was seen as a stress fracture. (Figure 3)

Conventional roentgenograms may be normal, when stress fractures are indeed present for three reasons: 1) appearance of reactive bone formation is usually delayed from three weeks to three months after the development of symptoms (2,6); 2) reactive bone formation and fracture may be present, but not identified because the reactive bone was tangential and the fracture line not perpendicular to the x-ray; 3) the wrong area was examined roentgenographically because of referred pain (14). Devas, in his book *Stress Fractures*, as well as other authors, have emphasized the marked delay in radiographic appearance of stress fractures (1,4,6,17,19).



Figure 1

Figure 1. A roentographic exam of a college freshmen gymnast taken on February 22, 1984. The radiologist impression of these films—"Normal Right Leg". This gymnast has experienced pain, point tenderness in the right tibia for a period of 2½ weeks.



Figure 2

Figure 2. A roentographic exam of the same Right Tibia as seen in Figure #1, taken March 6, 1984. The radiologist impression - "Slight thickening of the medial tibial cortex indicating some perosteal reaction of the distal third of the tibia."



Figure 3

Figure 3. A roentographic exam of the same right tibia as seen in Figures 1 and 2. The radiologist impression on April 5, 1984 - "No change in appearance. In a female of

this age, this is most likely stress fracture rather than osteoid osteoma."

Figure 4. A roentographic exam of a college Junior gymnast on Oct. 31, 1983. Impression by the Radiologist - was that of a normal Right leg: "This gymnast has experienced several weeks of pain in the middle of her right tibia without any antecedent trauma."

Figure 5. Roentographic exam of the same right tibia as seen in figure 4, taken January 5, 1984. Impression of the Radiologist - "Stress fracture of the mid tibia."

Figure 6. Roentographic exam of the same right tibia as seen in Figure 4 and 5, taken April 30, 1984.



Figure 4

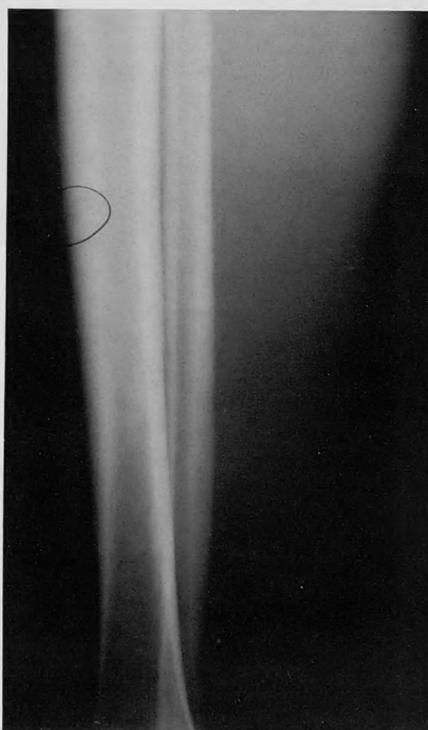


Figure 5



Figure 6

The ability of $99m^{Tc}$ -phosphate (a radioactive-labeled substance) to accumulate primarily in areas of high bone blood flow and metabolic activity makes it highly useful in detecting early stress fractures which the radiograph cannot resolve (18). $99m^{Tc}$ technetium-phosphate radionuclide bone scan has been shown to demonstrate early pathophysiologic changes in bones prior to the appearance of radiographic changes (8). These pathophysiologic changes or "Hot spots" on positive bone scans can be seen within the first few days of the initial clinical findings (3,9,10,14,16).

A normal bone scan excluded the diagnosis of stress fracture. Conventional roentgenograms must still be obtained for several reasons: 1) Abnormal findings of stress fracture would eliminate the need of a bone scan. 2) Conventional roentgenograms are more specific and can identify causes of falsely abnormal bone scans such as tumors and infections. If a stress fracture is suspected clinically and conventional roentgenograms are normal, a radionuclide bone scan is indicated. Rosen, Micheli, and Trevis recommend that the initial utilization of roentgenographic examination of adolescents with stress associated symptoms be replaced by radionuclide scintigraphy that is not limited to symptomatic areas (15). Their studies revealed a high incidence of multiple bone foci with abnormal scintigraphy associated with either referred pain or no local symptoms. The role of roentgenograms following identification of focal abnormal sites by scintigraphy is important in the clinical management of athletes with stress injury. Early identification of stress-associated abnormal bone will expedite treatment and prevent disastrous sequelae.

Treatment

Once a stress fracture has been diagnosed, it is important to emphasize the need for rest to allow healing. Undiagnosed stress fracture can progress to complete fractures with displacement (1,7,12).

The athlete should refrain from activity that causes pain. A bicycle or swimming program can be instituted to maintain cardiovascular fitness.

Protocol for return to full activity would include absence of point bone tenderness, localized swelling, and presence of radiographic evidence of developing bone callus. Resumption of activities (running, jogging, etc.) should be gradual so as not to further aggravate the healing bone, causing symptoms to recur.

Summary

Stress fractures occur in normal bone subjected by repeated episodes of minor stress. Originally described during World War I, stress fractures have been found to occur throughout the skeletal system in a wide range of individuals. A presumptive diagnosis of stress fracture is based on clinical findings of point tenderness of the bone and localized swelling in the area of the stress fracture. Symptoms of pain, point tenderness often occur in other over-use injuries often causing misdiagnosis.

Most common conventional roentgenograms may be normal, though radionuclide bone imaging demonstrate evidence of stress fractures. The ability of $99m^{Tc}$ -phosphate compounds to accumulate primarily in the areas of high bone blood flow and metabolic activity make them highly useful in detecting early stress fractures which the radiograph cannot solve. Most previous reports of bone imaging for the detection of stress fractures is vitally important in athletics. Early detection of stress fractures elicits early treatment. Undiagnosed

and un-treated stress fractures can progress further to complete fractures with displacement.

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The Utilization of Athletic Trainer/Team Physician Services and High School Football Injuries

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The South Carolina High School Injury Reporting System recorded 1079 football injuries from 36 schools during a two season period. Of the 36 schools, 9 did not have the services of either a trainer or a team physician, 3 did have a trainer but no physician, 9 had a team physician but no trainer, and 15 schools had the services of both a trainer and team physician. Offensive players incurred 56% of the injuries, defensive players 43% and 1% of the injuries were to specialty squads. Ankle and knee sprains/strains accounted for the majority of the injuries. The triage activities performed by the trainer provided a valuable service to the team as demonstrated by the trainer/physician team reporting the greater number of injuries during practice, the greater number of "less severe" injuries, and the greater number of injuries examined by a physician. These findings would indicate that these athletes were recognized, treated and resumed playing with less chance of re-injury because medical services were provided to all injured players and not just those with injuries that withheld the player from competition. The constant monitoring of injuries and their causes must surely have a significant impact in making the game of football safer for its participants.

Since man first participated in athletic contests, injuries have played an important part in the outcome of many events. Sports medicine, until recently, consisted of some prevention, with the main emphasis directed toward the treatment and rehabilitation after the injury occurred. Many young people have seen their athletic careers ended and, possibly, the quality of their lives diminished due to improper care of their injuries.

Those now charged with the care of athletes recognize the importance of the epidemiological study. From such studies researchers can provide new insights into the cause, or causes, of injuries; thus new methods of prevention can be recommended. These professionals are also aware that successful epidemiological studies

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require accurate and sufficient data collection systems (11).

Football has proven to be the sport posing the greatest threat of injury to its participants (3,7,22). With more than 958,000 players, this sport should command the greatest concentrated effort of those investigators studying epidemiological results (14).

The South Carolina High School Injury Reporting System, implemented in 1980, attempts to provide administrators and coaches with an accurate medical history of their players; at the same time it generates an epidemiological review of all injuries from football (12). The overall success of the program in its first two years has provided strong statistical evidence to the importance of a strong medical support team. The alliance of a team physician and an athletic trainer, is, of course, the most recognized sports medicine delivery system (8,5,10,13,15). A closer look needs to be taken at the role each of these persons should play in the proper recognition, rehabilitation, and—most important—the prevention of injuries. Failure to do so could result in unnecessary morbidity and incapacity to a team and its players (1,18,19). Researchers can then make strong recommendations on the future course of developing a cost-effective, yet effective, sports medicine delivery system.

Materials and Methods

Thirty-six high school football programs were selected, thus providing a broad spectrum of school sizes, medical services, and geographical locations within South Carolina for the years 1980 and 1981. Each school was

issued a questionnaire concerning the available medical services for their team and 50 copies of the injury reporting form. The questionnaire requested the name of the primary team physician, if any, and the availability of an athletic trainer. Our definition of an athletic trainer is an individual, certified or non-certified, whose primary and remunerated services are concerned with the treatment and eventual rehabilitation of athletic injuries.

Each school was requested to report all injuries, an injury being defined as any recognized disability event. Each injury form contained the following information:

1. School Code
2. Date of Injury
3. Activity Designator at Time of Injury
4. Player Identification Number
5. Assigned Injury Number
6. Type of Injury
7. Anatomical Location of Injury
8. Injury Severity Code (based on length of incapacitation)
9. Football Position of the Player
10. Player Age
11. Height of Player
12. Weight of Player
13. Incidence of Examination by a Physician

All information was completed at the time of the injury with the exception of the severity code which was completed when the player returned to full strength. Each form required 20 to 30 seconds to complete.

All forms and questionnaires were gathered at the end of the season and the data entered on the University of South Carolina's computer system.

Descriptive data such as age, height, weight, location of injury by football position, etc., were compiled. Injuries were stratified according to the type of trainer/physician services available to the school. Location and type of injury were analyzed by the type of service

provided. Statistical comparisons were determined using the Chi-square statistic.

Results

1079 injuries were reported by the 36 schools during the two seasons. The median age of the injured players was 17 years old, with a median weight of 76.0 Kilograms (167.5 pounds) and a height of 177.8 centimeters (69.3 inches).

Table #1 displays the location of injuries by player position, with defensive linemen suffering the largest number of injuries, followed by offensive backs. Offensive players incurred 56 percent of the injuries, defensive players 43 percent, and one percent involved the specialty squad members. The most predominant injuries were to the knee, ankle, and arm respectively.

Table #2 presents the locations and types of injuries classified by the level of clinical service rendered with statistical comparisons. Ankle and knee sprains/strains accounted for the majority of the injuries for each severity code and clinical service level.

Of the 36 schools participating, nine did not have the services of either a trainer or a team physician, three did have a trainer but no physician, nine had a physician but no trainer, and 15 had the services of both a trainer and a physician. The clinical specialties represented by physicians (24) were indentified as follows: eight orthopedic, 12 family practice, one emergency medicine, two pediatricians, and one occupational medicine.

Severity, place of occurrence, physician examination, injury repetition, and average number of injuries by clinical service level are summarized in Table #3.

A significant difference was noted in severity distribution with the teams with trainers assessing injuries as less severe than the non-trainer schools.

Significantly more injuries were recognized by non-trainer schools as occurring during games. Succinctly put, trainers recognized substantially more injuries

TABLE 1
LOCATION OF INJURY BY PLAYER POSITION

Position	Offen Back N#167	QB N#73	Offen Rec N#51	Offen End N#56	Offen Tac/Gu N#164	Center N#45	Defen Back N#145	Defen Line N#196	Line- back N#72	Kicker N#7	Other N#7	Total N#983
Location of Injury												
Head	6%	10%	4%	2%	6%	9%	3%	3%	7%	0%	0%	5%
Pelvis	2	0	0	5	2	0	1	1	3	0	0	1
Ribs	5	10	0	5	1	2	4	2	1	0	0	3
Spine	2	0	4	0	1	7	0	2	0	0	0	1
Neck	1	1	2	2	2	0	4	5	8	0	0	3
Chest	1	4	2	2	0	0	1	1	0	14	0	1
Arm	13	12	14	11	12	16	17	18	14	14	17	14
Wrist	2	4	4	0	3	0	1	2	4	0	0	2
Elbow	2	2	2	2	2	2	3	1	4	0	0	2
Hand	4	0	6	7	4	4	4	5	3	0	17	4
Fingers	5	5	12	7	6	4	7	6	7	14	17	6
Hip	4	5	8	0	3	0	3	1	0	0	17	3
Thigh	7	10	4	4	5	9	5	3	3	0	0	5
Foot	1	3	0	5	2	0	1	2	0	0	0	2
Knee	20	11	22	18	22	13	15	21	15	29	17	19
Ankle	17	15	12	18	20	22	20	16	15	29	0	17
Shin	1	1	2	2	3	4	2	2	4	0	17	2
Toe	2	0	2	2	1	2	0	2	1	0	0	1
Other	4	5	2	7	5	4	8	5	10	0	0	5
% of Total by Position	17	7	5	6	17	4	15	20	7	1	1	

during the practice situations. In addition, the doctor and doctor/trainer teams reported a significantly higher level of physician-examined injuries.

Discussion

Epidemiological monitoring of injuries can contribute to the good of the sport. Head and neck injuries, often the most severe and unquestionably the most feared, were all recorded in the lower severity codes in our report. This would indicate that rule changes, proper equipment fitting, and fundamental coaching changes suggested by past studies have in fact had a most positive impact on the game today (2,4,17,20).

It is encouraging to note that less severe injuries, that is those injuries that incapacitate a player for less than one week, constituted 78 percent of the total injuries. These would appear to be those injuries that can, and should, be treated by a certified trainer and reviewed by a physician. This leaves but 22 percent of those injuries that would require more attention by the team physician.

The most recognized injuries involved ankle, knee, and wrist, a finding that is consistent with other investigations (6,9,16,21). Severe injuries, those resulting in surgery and/or the loss of the player for the season or

longer, comprised seven percent of our total. All of these injuries were musculo-skeletal in nature. The numbers would indicate that the orthopedist, certified trainer, and the family practitioner are essential members of the medical care team in dealing with these less numerous but potentially more catastrophic injuries.

Few, if any, teams can have the physician attend practices. Therefore the triage duties performed by the trainer are valuable services to the team physician. The success of these triage activities is demonstrated by the trainer/physician team reporting the greatest number of injuries during practice, the greater number of "less severe" injuries, and the greatest number of injuries examined by a physician. These figures would indicate that these players were recognized, treated, and resumed playing with less chance of re-injury because medical services were provided to *all* injured players and not just to those with injuries that withheld the player from practice or a game.

The success of any medical service system is contingent on an enlightened administration and coaching staff. Accounts of conflicts between coaches and their medical staff on the wisdom of playing an injured athlete are as old as sports. If the system is to be effective, however, coaches and administrators must

TABLE 2

LOCATION AND TYPES OF INJURIES BY MEDICAL SERVICE

Location of Injury	No Trainer No Doctor N#226	Trainer No Doctor N#160	No Trainer Doctor N#241	Trainer Doctor N#414	No Trainer N#484	Trainer N#594	No Doctor N#389	Doctor N#690
	Head	4%	5%	2%	7%	3%	7%	4%
Neck	3	1	4	4	4	3	2	4
Shoulder	13	17	13	15	13	16	15	14
Elbow	2	1	3	2	3	2	1	2
Wrist	5	5	2	2	3	3	5	2
Hand	8	3	4	5	5	4	6	4
Fingers	9	8	6	5	7	6	8	6
Spine	1	4	2	1	2	1	2	1
Ribs	4	3	3	2	4	3	4	3
Chest	0	0	2	2	1	1	0	2
Pelvis	0	2	1	1	1	1	1	1
Thigh	3	8	5	6	4	6	5	5
Hip	4	3	3	1	4	2	4	2
Knee	18	13	24	18	21	17	16	20
Ankle	15	18	19	16	17	17	16	17
Shin	2	1	2	3	2	2	2	3
Foot	3	1	2	1	2	1	2	2
Toe	1	1	1	1	1	1	1	1
Other	5	6	2	8	3	7	6	6
Level of Significance		P<.01			P<.01		P<.01	
Type of Injury								
Abrasion	4	4	3	2	4	2	4	2
Knocked Uncons	1	1	0	1	0	1	1	1
Fracture	11	17	11	10	11	12	13	10
Dislocation	4	0	3	2	3	1	2	2
Strain/Spra	50	46	59	55	55	53	49	57
Stunned	2	1	4	3	3	3	1	3
Contusion	22	26	19	18	20	20	24	18
Heat	2	3	0	1	1	2	2	1
Other	4	2	1	8	3	7	4	6
Level of Significance		P<.01			P<.01		P<.01	

TABLE 3

FOOTBALL INJURIES BY TYPE OF MEDICAL SERVICE

Severity of Injury	Trainer/Doctor Service				Trainer Service		Doctor Service	
	No Trainer No Doctor N#226	Trainer No Doctor N#160	No Trainer Doctor N#241	Trainer Doctor N#414	No Trainer N#484	Trainer N#594	No Doctor N#389	Doctor N#690
	1	35%	30%	15%	28%	25%	29%	33%
2	13	25	14	17	13	19	18	16
3	27	29	47	32	38	31	27	38
4	12	11	12	10	12	10	12	11
5	5	1	3	6	4	4	3	5
6	8	3	9	7	8	6	6	7
7	0	1	0	0	0	1	1	0
Level of Significance		P<.01			P<.01		P<.01	
Injury Occurred During Game	72.2%	65.6%	65.8%	57.9%	69%	60%	69%	61%
Level of Significance		P<.01			P<.01		P<.01	
Injury Examined By Physician	50.7	43.8	57.9	60.2	54	56	48	59
Level of Significance		P<.01			P<.05		P<.01	
Repeat Injury in One Season	2.6	6.9	3.3	4.8	3.0	5.4	4.4	4.3
Level of Significance		not significant			not significant		not significant	
Average Number of Injuries/School	25.1	53.3	26.8	27.6	25.1	31.9	32.2	27.3
Level of Significance		P<.01			P<.01		P<.01	

utilize the skills of the team physician and certified trainer. Such confidence in the team's medical service system can then be a positive addition toward the team's success. At the same time, the constant monitoring of injuries and their causes by skilled professionals must surely have a significant impact on making the game of football safer for its participants.

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Salt Replacement by Natural Methods

Martin A. Herker, ATC, EMT-I

Inadequate salt intake for the athlete in training can reduce performance level and potential. Most coaches, athletes, and trainers no longer believe in depriving the body of water during activity; however, for some athletes the replenishing of vital salts remains neglected. The author presents the scope of the salt deficiency problem through explaining key concepts and the physiology of sweating and body salts. He suggests two methods to eliminate the problem. One is the use of dietary supplements. The second method is eating a balanced diet. A list of recommended foods that can enhance salt levels is included. Treating and preventing salt related problems can be simple with increased subject knowledge and better nutritional planning.

The need for adequate fluid replacement during and after exercise is evident to most coaches and trainers. Much time has passed since the days when an athlete "wasn't tough" if he or she had to have a drink during practice or competition. By maintaining adequate fluid levels, the body keeps operating at its peak potential.

However, one item that is still neglected is the importance of salt replacement as a companion to fluid replacement. One assumes that the athlete comes to the practice after being on a balanced diet with the body's salt and water reserves well stocked. Unfortunately, this is not always the case. Because of other factors, the amount of water and salts in the body may not be at peak levels. It is possible that the athlete may replace liquid volume throughout the practice without replenishing salt stocks.

It is the purpose of this paper to present the importance of salts in the body, their associated deficiencies and symptoms, and a program of balanced addition of vital salts to the body without the use of artificial aids.

Definitions and Constants

The standard subject of this paper is a 70 kilogram (150 pound) individual. Of this mass, 60% is water. Three fourths of the water is bound in the cells as intracellular fluid. The remaining quarter is found in the plasma and interstitial fluid (2, 6).

Salt levels in food and supplements are commonly given in milligrams (mg) per serving whereas the serum level is presented in milliequivalents per liter (mEq/L). To convert milligrams sodium to milliequivalents divide by 23. The same conversion for potassium would be division by 39. Conversely, one milliequivalent of sodium equals 23 milligrams. A milliequivalent of potassium represents 39 milligrams (2).

Physiology of Sweating

Sweating is a complex natural process used by the body to control the rate of heat released by the skin. It is controlled by the rate of metabolism, ambient temperature, humidity, and sympathetic nervous system. Water and salts from the plasma diffuse across the arterial walls into the interstitial fluid. From there, the liquid flows into the cells of the sweat gland which produce the product.

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A certain amount of sweat production is normal under all circumstances. This low level production is called insensible loss (2). Its composition is low in dissolved salts as the distal tubule of the sweat gland will reabsorb much of that material prior to excretion.

However, as the rate of production increases, this reabsorption will show a marked decrease. The sodium level will rise from 10 mEq/L in a resting individual to 30 mEq/L in an active person. Potassium content will vary from 5 to 10 mEq/L. Chloride levels also increase, milliequivalent for milliequivalent, to match the combined loss of sodium and potassium (2).

Salt losses at the insensible level are easily replaced by the normal diet. At the increased rate of production however, the normal diet may not contain adequate levels of sodium or potassium for replacement as will be illustrated.

Physiology of Body Salts

Sodium is one of the most prevalent positive ions in the body fluids. It is responsible for regulation of the water balance between the plasma and interstitial and intercellular fluids. In the plasma, its normal range is from 136 to 145 mEq/L (2, 6). Sodium levels in sweat vary from 10 to 30 mEq/L depending on the rate of production (2).

Low serum sodium (hyponatremia) can result from two causes in athletics. First, the condition may become evident with fluid loss without liquid replacement. By sweating, water and salts transfer across the membranes and lower the serum levels. The alternate method may be caused by the athlete who replaces fluids without the companion salt replacement, producing water intoxication by diluting the already lowered salt levels. Both present similar symptoms of muscular weakness and cramping. Confusion may result in severe deficiencies. To differentiate between the two, the skin is the key. In hyponatremia with dehydration the skin will be sunken and without its normal turgor. In water intoxication, the skin will appear normal and full.

Potassium is the other prevalent cation in the body fluids. It has an action similar to sodium in the regulation of body fluids. Whereas sodium controls the fluid levels outside the cells, potassium maintains the proper fluid levels intracellularly. Potassium is also responsible for proper transmission of impulses in muscle and nerve tissues. Normal serum potassium levels are 3.5 to 5.0 mEq/L (2, 6) with the sweat levels roughly twice that at

5 to 20 mEq/L (2).

Low serum potassium (hypokalemia) presents similar signs as dehydration and lack of sodium in muscular weakness and possibility of cramping. However there are more serious problems that may develop. With this cation needed for impulse transmission, its lack may result in the development of cardiac dysrhythmias (2, 3).

Anions found in the plasma, in order of decreasing concentration, are chloride, bicarbonate, and phosphate (2). When the fluid in the plasma diffuses across the blood vessel wall to the interstitial fluid space and then to the cell, the bicarbonate and phosphate are essentially left behind in the plasma with very little showing up in the sweat. Chloride therefore, is an essential anion to maintain the proper balance of bicarbonate in the plasma for proper pH of the blood.

Scope of the Problem and Solution

For each liter of fluid released in an active individual as sweat, the body loses 30 milliequivalents of sodium and 10 milliequivalents of potassium (2). Therefore, for our 70 kg competitor, a loss of 2.5 kg of body mass represents a loss of 2.5 liters of fluid, 75 mEq of sodium, 25 mEq of potassium, and 100 mEq of chloride. Losses such as this are not uncommon during hot, humid weather.

The fluid losses may be, and usually are, recovered quite quickly following exercise. Water alone, however, does not replenish the depleted salts. The salts lost in the sweating process represent 1,725 mg of sodium and 975 mg of potassium. This should be replaced to avoid the problems illuminated earlier.

Table 1. Calories, sodium, and potassium levels for selected foods (1, 4, 5, 6).

FOOD	SERVING SIZE	Calories	mg Na	mg K
MILK, CHEESE, AND EGGS				
Milk whole or skim	8 ounces	159	122	350
Yogurt lowfat	8 ounces	123	150	350
American process cheese	1 ounce	105	406	60
Cheddar cheese	1 ounce	113	176	35
Cottage cheese	1 ounce	239	116	50
Swiss cheese	1 ounce	105	74	30
Egg	1 medium	72	59	40
MEATS				
Beef lean	4 ounces	200	72	480
Ham	4 ounces	212	1480	440
Bacon	1 slice	43	130	100
Pork lean	4 ounces	452	80	520
Chicken roasted	4 ounces	190	276	400
Bologna	1 slice	86	220	150
Frankfurter	1 serving	124	728	160
Peanut butter	1 table spoon	94	81	110
SEAFOOD				
Haddock	1 ounce	47	50	130
Salmon	1 ounce	40	120	120
Tuna	1 ounce	55	100	100
Shrimp fried	1 ounce	64	53	100
VEGETABLES				
Carrots fresh	2 sticks	30	34	180
Carrots canned	1/3 cup	45	125	50
Peas fresh cooked	1/3 cup	114	2	80
Peas canned cooked	1/3 cup	150	110	100
Potato baked with skin	1 medium	145	5	400
Radish	4 small	32	2	90
Snap beans fresh	1/3 cup	31	2	80
Snap beans canned	8 ounces	35	120	80
FRUITS				
Apple	1 medium	96	2	120
Banana	1 medium	101	1	400
Grapefruit	1/2 medium	40	1	80
Grapes white seedless	1/2 medium	34	2	105
Orange	1 medium	71	1	300
Pear	1 medium	100	3	110
Raisins	1/3 cup	140	13	410
Strawberries	10 medium	55	1	140
BREADS AND CEREALS				
Bread whole wheat	1 slice	61	32	45
Bread white	1 slice	76	114	45
Bran muffin	1 muffin	118	176	30
Macaroni/spaghetti noodles	1 cup	192	2	60
Rice	1/2 cup	223	6	40
Corn flakes	1 cup	97	251	30
Shredded wheat	1 cup	89	1	30
Raisin bran	3/4 cup	120	13	200

There are two methods available to replace the losses. The first option is to use dietary supplements that provide the needed sodium and potassium salts. These can take the form of tablets or additives to the fluids the athlete will take prior to, during, or after competition. However, there are those that have an aversion to taking pills and many athletes complain of the taste of replenishment drinks. The second method is quite simple. The athlete eats a normal diet that uses portions from all food groups. This should provide the balanced replacement required. However, athletes in training may not be eating a proper diet. Some persons because of personal likes and dislikes do not eat certain foods. Any person trying to lose weight will be at risk because he or she is intentionally reducing the intake of water and food.

The idea then is to present a food list that will appeal to most people, not exceed their calorie count, and still provide the essential salts that they are losing through sweating in practice or competition. This list is presented in Table 1. The coach, trainer, or athlete figures the weight loss, calculates the amount of sodium or potassium needed for full replacement, and consults the food chart for the foods that will provide needed materials and not exceed a calorie limit if one is used.

The chart is by no means complete (1, 4, 5). It serves to give a range of foods that should appeal to most tastes and achieve the prescribed end. As a general rule, fresh fruits and vegetables will have a high potassium content with a relatively low sodium content. Preserved meats and vegetables will be high in sodium which is added in the canning or preservation process.

For example, an athlete loses 1.5 kg of mass during the morning practice, for the best performance, this loss of fluid and salt should be replaced. As noted above, the liquid loss is replaced through regular water intake, water in food, and water generated by metabolism. The salts could be replaced by simply adding or using as a part of the diet the foods shown in Table 2. Realistically, for some athletes this is a small meal while for others it is large. The main point is the ease with which sodium and potassium replacement may be accomplished.

One should note that the total amount of sodium and potassium in the meal exceeds the needed amount. Not all of the salts ingested will reach the cells of the body. Some will remain bound with the food as it passes

Table 2.
Meal for replacement of 1035 mg Sodium and 585 mg Potassium.

FOOD	mg Na	mg K
1 glass skim milk	122	350
1 ham slice	1480	440
2 slices whole wheat	64	90
2 carrot sticks	34	180
1 apple	2	120
TOTAL	1670	1135

through the digestive tract and be unavailable. Secondly, excesses that may occur can be stored temporarily in the cells and body fluids. Finally, for a normal healthy individual, the kidneys would excrete any excess that would exist.

Conclusion

To prevent possible problems, salt replacement is needed as a companion to fluid intake. Although aids to the diet are needed at times to correct known deficiencies, there is no real need for them to be used by a normal athlete using some prudence in the selection of foods. These individuals can replenish their stocks without the extraordinary measures.

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A Clinical Study of Topical 10% Triethanolamine Salicylate Cream for Relief of Postexercise Muscle Pain

Virginia Politino, PhD
Sarah L. Smith, PhD
William C. Waggoner, PhD, FAACT

Delayed-onset muscle soreness, unrelated to physical malformation or severe damage, is a well-known phenomenon that develops after strenuous, unaccustomed exercise. Although the condition is self-resolving, trainers, physio-therapists, team physicians, and sports medicine specialists are often called on to alleviate the symptoms of postexercise muscle soreness. This report presents the results of a double-blinded clinical study in which a topical analgesic containing 10% triethanolamine salicylate in a cream base (Sportscreme™) was evaluated for its ability to relieve delayed-onset exercise-induced muscle pain. Forty-two men and 48 women, 18 to 60 years of age, participated in this study. All tests of statistical significance were based on the Chi-square statistic. Triethanolamine salicylate was more effective than placebo in alleviating delayed-onset muscle soreness. There were no adverse reactions to the cream-base preparation of 10% triethanolamine salicylate.

Key words: delayed-onset muscle soreness, exercise-induced pain, triethanolamine salicylate, Sportscreme™, clinical trial.

If a person engages in strenuous, unaccustomed physical activity, the muscles worked may later become very painful and hard. This postexercise, or delayed-onset, muscle soreness, unrelated to physical malformation or severe damage, has been well described and although its exact etiology remains unclear it is generally thought to be due to disruption of intramuscular connective tissue elements (1,3,6,7). The time course and severity of the condition vary depending on factors such as the physical state of the person exercising and the intensity and duration of activity (2). However, symptoms typically appear within hours after exercise, exacerbate over the next day or two, and then gradually subside to the point of no discomfort after three or four days.

Despite its self-resolving nature, delayed-onset muscle soreness can be very painful. Although there is no universally accepted remedy to relieve this pain or to speed resolution of the condition, most authorities concur that immobilization or "favoring" the affected muscle group is contraindicated (9,11). It is better to maintain activity and preserve range of motion. Frequently, however, the presence of pain decreases the likelihood that a patient experiencing delayed-onset muscle soreness will comply with such a recommendation.

Various remedies intended to alleviate this pain have been developed. Some, such as hotwater soaks, whirlpool baths, steam packs, and massage, offer temporary relief at best and often involve elaborate, expensive equipment.

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Other treatments, like camphor and methyl salicylate balms, present other possible drawbacks such as medicinal odor or oily residue. Sportscreme™ is 10% triethanolamine salicylate in a pleasantly scented cream base. It is an external analgesic rub intended for the relief of muscle aches and pains resulting from strenuous exercise or sports activities. Penetration of the active ingredients directly into affected areas has been demonstrated using radiolabeled tracers (5,8). In this double-blind clinical study, Sportscreme™ and a pharmacologically inactive placebo cream were compared for their effectiveness in relieving the pain of postexercise muscle soreness.

Method

This study was a double-blind, placebo-controlled, randomized parallel design clinical trial of seven days' duration. Ninety volunteers (42 men and 48 women) participated in the study. They ranged in age from 18 to 60 years. All were in good general health and none were taking any concurrent medication. All volunteers participated in vigorous physical sport-related activity, such as marathon dancing, exercise classes, a triathlon, and weight lifting. The muscle soreness was induced through these activities. Each subject was asked to subjectively rate the pain and only subjects with moderated to severe exercise-induced muscle pain, as subjectively analyzed by the subject and investigator, were admitted to the study. Weight, blood pressure, and pulse rate were measured at the beginning and end of the study. Written informed consent was obtained from each volunteer.

Each subject received three 3-ounce coded tubes of either triethanolamine salicylate or a pharmacologically inactive placebo cream. The creams were not known by investigator or subjects until completion of the study

when the code was broken. No more than 12 hours elapsed after exercise until the first application of cream. The cream was spread lightly over the sore muscle area for approximately one minute or until absorbed. Subjects were instructed not to massage or deep-rub the cream into the treatment site. To demonstrate correct technique, the first application for each subject was made by one of the investigators. No more than two applications of cream were permitted daily, and at least five hours had to elapse before the second application. Ice/heat treatments, concomitant ointments, or medications were not permitted for three hours prior to or four hours after any application of cream.

Subjects received report cards (see Figure 1) and were asked to assess their perceived pain level, pain relief, and activity level of the treatment site each day after the first application of cream.

The various indices of measurement were defined as follows:

Pain Level

- Severe: Interferes with normal activity and impedes movement; at night pain is constant and markedly interferes with sleep.
- Moderate: Activity is tolerated but movement is limited; at night pain inhibits onset of sleep and can interrupt established sleep.
- Mild: Pain causes little or no limitation of movement; at night pain is insufficient to interfere with onset of sleep.
- None: No pain or discomfort.

Pain Relief

- None: No change over the evaluation period.
- Fair: Some pain relief with slightly increased mobility.
- Moderate: Moderate pain relief with mobility increased, but with some limitation.
- A lot: No limitation in mobility, but with some minor discomfort.
- Complete: No pain or limitation in mobility.

Activity Level of Treatment Site

- None: Completely inactive.
- Mild: Activity limited and restricted to slow movement.
- Moderate: Almost normal movement with occasional periods of rest and compensation.
- Normal: No limitation of movement; activity produces slightly increased heart rate and some sweating.
- Strenuous: Rapid movement produces markedly increased heart rate and profuse sweating.

At the end of the seven-day trial, investigators reviewed the data recorded by each subject during a personal interview. All report cards were collected for data collation and analysis, and all unused study material was returned. The identity of the contents of each returned tube was confirmed using a drop of ferric chloride solution, which reacts with salicylates to give a purple or violet color. All tests of statistical significance were based on the Pearson goodness-of-fit Chi-square statistic, without correction for continuity.

Results

For purposes of statistical analysis, the groupings for patients' overall evaluation of relief from pain given by the creams were: poor, fair, and good/excellent. The results reported as good or excellent were combined

because, when analyzed separately, the numbers in some cells were less than five, and, thus, the Chi-square test may have been invalid (3).

There were no gross incomparabilities in baseline characteristics (age, sex, race, and weight) or in evaluation of initial pain symptoms between the active (triethanolamine salicylate) and placebo groups. One subject from the placebo group developed a rash after the third application of cream and withdrew from the study; one subject from the triethanolamine salicylate group was discovered to have had only mild initial pain, while the protocol required moderate or severe pain for inclusion in the study; and five subjects were lost to follow up (see Table 1). Data from these seven subjects were not included in the final analyses. Of the five subjects lost to follow up, all of whom were from the triethanolamine salicylate group, only two could be contacted. Neither subject indicated that failure to continue the study was due to treatment.

The final study population included 39 active (triethanolamine salicylate) and 44 placebo subjects. Chi-square analysis showed significant ($p < 0.05$) differences between the two groups: 39% of the triethanolamine salicylate group said they received good-to-excellent relief from their muscle pain, while only 20% of the placebo group reported this; and while 48% found that the placebo gave poor results, only 23% rated the effectiveness of triethanolamine salicylate as poor (see Table 2).

Table 1
Study Population Data

	Triethanol- amine salicylate	Placebo	Total
Entered Study	45	45	90
Violated protocol	1	0	1
Adverse experience	0	1	1
Lost to follow-up	5	0	5
Completed study	39	44	83

Each subject was asked to report any adverse effects to the topical triethanolamine salicylate. None of the subjects reported any adverse reactions to the cream. Chi-square analysis found no statistically significant differences between the treatment groups with respect to weight, blood pressure, or pulse, either at the beginning or at the end of the study.

Table 2
Patient Evaluation of Effectiveness of Triethanolamine Salicylate or Placebo in Relieving Muscle Pain

Group	Rating			Total (%)
	Poor (%)	Fair (%)	Good/ Excellent (%)	
Triethanolamine salicylate	9 (23)	15 (38)	15 (39)	39 (100)
Placebo	21 (48)	14 (32)	9 (20)	44 (100)

For Poor and Good/Excellent ratings, the differences between triethanolamine salicylate and placebo groups were statistically significant ($p < 0.05$).

Discussion

Delayed-onset muscle soreness is a well-known phenomenon that results from vigorous, unaccustomed exercise or sports activities. Although the precise etiology of this often painful condition is not yet known, it is probably related to disruption of intramuscular connective tissue elements. In general, the onset of delayed muscle soreness is between one and five hours following the exercise or sport and increases for 24 to 48 hours. The time course of delayed muscle soreness is variable due to many factors among which are the intensity of exercise and post-exercise activities. There is general agreement that immobilization of the affected muscles or bedrest are not beneficial and indeed may prolong the recovery period for this self-resolving state. Light movement such as stretching, walking, dancing, or even the act of rubbing in liniment after the exercise session will help prevent delayed muscle soreness. Moderate activity at a relaxed pace should be maintained and range of motion preserved. Pain, of course, may render such recommendations impracticable for many patients. The primary cause of delayed muscle soreness for the present group of subjects was the condition of the subjects exercising. The majority of the subjects were unaccustomed to vigorous physical activity. In this clinical trial a topical cream analgesic containing 10% triethanolamine proved statistically significantly better than a placebo cream in alleviating delayed-onset, exercise-induced muscle soreness. The degree of improvement of the regiment was jointly and subjectively rated by the subject and investigators. It is important to remember that this condition is self-resolving, and it was expected that most of the subjects in both treatment groups would recover by the end of the seven-day trial. The subjects reported subjective improvement a few hours after application of the topical salicylate. What is remarkable in this study is the magnitude of difference noted: approximately twice as many subjects in the triethanolamine salicylate group reported good-to-excellent relief as did those in the control group (39% vs. 20%) and, conversely, approximately twice as many in the control group reported poor results as did those in the triethanolamine salicylate group (48% vs. 23%). In this study topical salicylate was found to provide prompt subjective relief with no adverse effects. The topical triethanolamine salicylate can be absorbed effectively through the skin achieving significant amounts of pain relief.

Because this topical cream preparation of triethanolamine salicylate effectively reduces pain, and thereby increases the probability of being able to use the affected muscles to maintain comfortable activity during the recovery period, the recovery period may be shortened. This hypothesis remains to be tested.

In this double-blind study of triethanolamine salicylate in the treatment of exercise-induced muscle pain of seven consecutive days, it can be concluded that the cream was effective in relieving muscle soreness, had no adverse side effects, and tended to provide quick relief.

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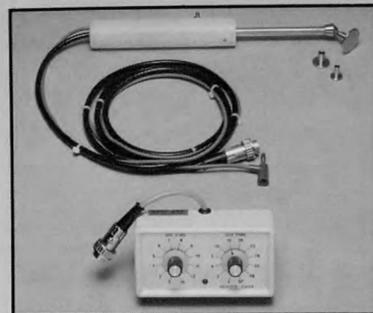
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Cervical Orthosis for Football

Jennifer Dix, MS, ATC
Gary R. Hanna, MS, ATC

Each year many football players suffer from brachial plexus stretch injuries, also known as "burners" or "stingers". This paper will deal with a solution developed to alleviate this problem due to excess cervical lateral flexion.

A nineteen year old male college offensive center had his head forced into severe right cervical lateral flexion during a contest. Initial examination revealed pain, numbness, and tingling in the left cervical area radiating down the left arm. Active ROM of the cervical spine was decreased and painful in right and left rotation, and right lateral flexion. Initial care consisted of ice massage and splinting utilizing a soft cervical collar. Cervical roentgenograms were unremarkable and the team physician made the diagnosis of a brachial plexus stretch. The injury was treated symptomatically until the athlete had full pain free ROM. The athlete was gradually permitted to resume participation the following week.

It was recommended that the athlete be fitted with a protective device to prevent recurrence. Prior to the injury the athlete was wearing a single neck collar. Due to the nature of his position, finding an appliance that would restrict lateral flexion but not interfere with other normal motion needed at that position presented a problem. Doubling the collar was ruled out due to the restriction of cervical extension. A section of a second collar was cut and applied to the right side only. This in effect created a double collar to limit right lateral flexion only while allowing normal extension and left lateral flexion. This arrangement proved unsatisfactory as the collars compressed and rolled, allowing excess motion. The athlete suffered a second occurrence using this arrangement. Upon recovery of the second incident, the athlete was fitted with a cervical orthosis constructed of Orthoplast.

The orthosis allowed normal cervical flexion, extension, left lateral flexion, and left rotation but limited right lateral flexion and right rotation. The athlete competed for the remainder of the season without recurrence.

Materials Needed

- 6" x 18" Sheet of Orthoplast
- 2 - 1/4" x 1/4" bolts with lock washers and hex nuts
- 6" x 9" x 1/2" adhesive foam rubber
- Drill with 1/4" drill bit

Ms. Dix is Assistant Athletic Trainer, Mr. Hanna, Head Athletic Trainer, at John Carroll University in Cleveland, Ohio.

Procedure

1. Cut 6" x 18" sheet of Orthoplast into shape illustrated. (Fig. 1)
2. Heat Orthoplast and fold in half. While still warm, place the 3" end between the metal bar (on the underside of the pad) and the shell. The end of the Orthoplast should extend laterally to butt against the strap of the deltoid pad. (Fig. 2) Form the Orthoplast to the contour of the pads and form a loop which at its apex provides the limit of motion desired. The outer edge of the Orthoplast should extend laterally to the medial border of the cantilever and inferiorly to the top of the shell. (Fig. 3) Usually the loop is of sufficient size to accommodate a regular round neck collar.
3. Round all edges as needed.
4. Drill two 1/4" holes through the orthosis, strap of the deltoid pad, and the shell from the inferior aspect. (Fig. 2 & 4)
5. Bolt the orthosis to the pad inserting the bolts from the inferior aspect. Cut excess bolt if needed.
6. Cut a 6" x 9" piece of adhesive foam rubber and apply to the exposed area. Tuck it around the anterior and posterior edges. Use of a contact cement will enhance adherence.
7. Cover the foam rubber with a heavy cloth-backed tape such as Elastikon or moleskin to prevent tearing of the foam by the chin strap buckles. (Fig. 6)

Discussion

The benefit of this device is to provide a rigid block to lateral flexion that can not be obtained using regular neck collars. It also allows for normal motion in all other ranges except cervical rotation to that side. This could be considered a drawback to the appliance although this lack of cervical rotation was no problem to this athlete.

Local football officials and the NCAA FOOTBALL RULES AND INTERPRETATIONS confirmed the orthosis was within the limits of equipment regulations according to Rule 1-4-4. (1)

The shoulder pads should be checked periodically for cracks around drill holes. No such cracks were noted during the use of the orthosis on this athlete, however,

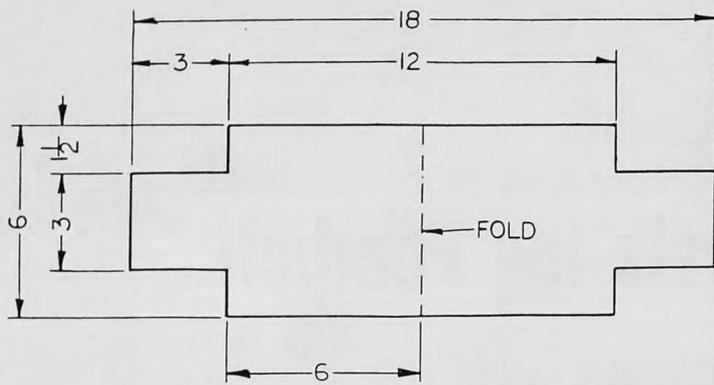


Figure 1

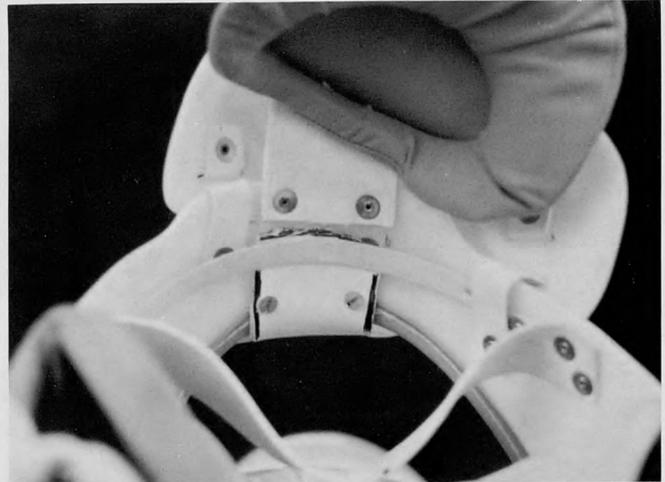


Figure 2



Figure 3

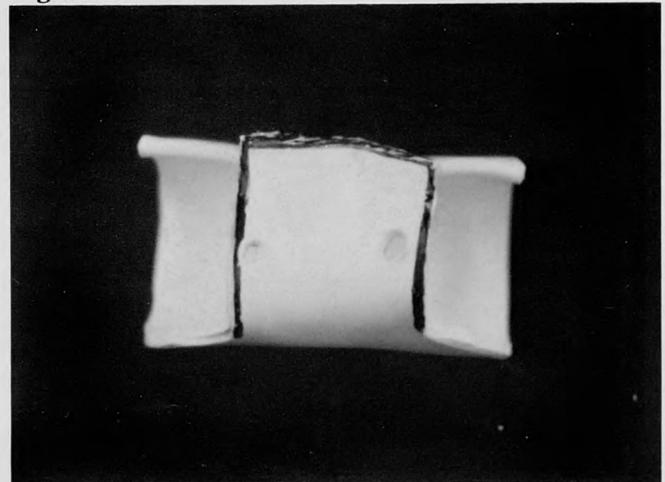


Figure 4



Figure 5



Figure 6

and the pads were used for five weeks of full contact. Periodic checks are still advised.

Utilizing this orthosis permitted the athlete to continue to compete for the remainder of the season with no further incidence. Progressive resistive exercises to increase the strength of the neck and shoulder musculature must always supplement the use of this orthosis to prevent recurrence of this injury.

This orthosis is effective and also inexpensive to construct. Approximate cost is under twenty dollars.

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Case Report

Fracture of the Scapula in a Professional Football Player

M. I. Culpepper, EdD

J. M. Roberts, MS, ATC

Injuries to the shoulder girdle have long been a part of tackle football. However, fracture of the scapula as a result of participating in this sport is uncommon (10). Although this injury has been reported occurring as a result of other traumatic episodes such as an automobile or motorcycle accident, the literature is void of discussion of this injury sustained by an athlete as a result of a sport activity (2,8,9). Therefore, the diagnosis, treatment, and rehabilitation of a fracture of the scapula in a professional football player is the topic of this report.

A 22 year old professional football player with no prior shoulder injury was playing tightend in a full scrimmage, pre-season practice when he received a pass and was hit on the posterolateral aspect of the left (non-dominant) shoulder by a linebacker making the tackle. After receiving the ball, the tightend turned to run up the field when the tackle was made. The linebacker's helmet made the initial contact on the shoulder pads over the scapular region. There was a sudden onset of pain. Physical examination revealed point tenderness along the lateral border of the scapula and shoulder joint pain with range of motion.

Motion was minimal in extension and abduction due to pain. There was no neurologic deficit or other associated injuries. Ice was applied to the area and the shoulder immobilized with an elastic wrap while the player was transferred to the training room for further evaluation. Radiographic examination revealed a longitudinal fracture just below the glenoid through the neck and lateral border of the scapula (Figure 1). Initial management of the injury consisted of immobilization of the shoulder with a sling and swathe for 8 weeks and periodic ice applications as needed to relieve pain.

At five weeks post injury, limited range of motion exercises were begun consisting of abduction/adduction, flexion/extension and pendular movements three times daily. Exercise sessions began with moist heat (hydrocollator) and ending with ice application for approximately 15 minutes. Except for the exercise sessions, the shoulder was kept immobile. Progressive weight work began at eight weeks post injury, three times daily.

A Cybex II isokinetic dynamometer and a Cybex Data Reduction Computer were used to evaluate muscle function in flexion/extension and abduction/adduction. Testing was done following the recommended procedures outlined by Cybex (4). At eight weeks the involved shoulder showed peak torque deficits greater than 50% in abduction and adduction and peak torque deficits greater than 20% in flexion and extension at speeds of 60/sec and 180/sec (Table 1). Range of motion in abduc-

tion was limited to 90° during the early stages due to pain. At 18 weeks, most of these deficits were reduced 20% and less and there was full range of motion with no residual stiffness. By 28 weeks post injury, all deficits were less than 15% and there were no remaining disabilities.

Discussion

The scapula appears to be vulnerable to injury due to its position on the posterolateral aspect of the chest wall. However, the incidence of scapula fractures appears to be low (9). The scapula is surrounded by muscles which not only protect it but also allow it to slide and recoil along the chest wall. In effect, when an impact occurs, the amount of time over which the force is dissipated increases, thus reducing the chance of a fracture.

When a fracture does occur, it is generally the result of a direct trauma of considerable magnitude resulting in other associated injuries (2,9). The incidence of associated injuries have been documented to be greater than 80% (2,8,9). Treatment, therefore, may be related to associated injuries. In addition, Armstrong, et al. and McGahan et al. reported that fractures of the neck occurred in only 18% and 26% respectively of the scapular fractures (2,9). Management of isolated fractures is generally conservative and favors immobilization from four to six weeks, followed by a rehabilitation consisting of progressive exercises with local ice and moist heat. Because of the abundance of musculature and vascularization around the scapula, healing of a fracture is generally rapid and uneventful with little, if any, residual disability.

The incidence and type of injuries in football have been well documented (1,3,5,6,10). Mechanism of injury and methodologies of treatment are of primary concern in an effort to reduce the number and severity of injuries and reduce the amount of time lost to practice and games once an injury has occurred. Any injury is the result of an extrinsic or intrinsic force overload, in which the strength characteristics of a tissue is exceeded, resulting in ultimate failure of that tissue. An example of an intrinsic force overload has been reported in which the avulsion fractures of the scapula occurred as a result of muscular spasm due to an electrical shock (7). The force of muscle contracture exceeded the tensile strength of the bone. However, the present case is an example of an extrinsic force overload in which a single, direct blow

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Figure 1 Radiograph showing scapular fracture

was delivered by a helmet over the shoulder pads and scapular region. The actual contact of the helmet and shoulder pads is relatively small. The shoulder pads were unable to distribute the force of the impact over a larger area or over a longer period of time. Therefore, the force transfer from the helmet to the scapula was concentrated in a small area over a short duration of time and were the contributing factors in bone failure.

Intramuscular hemorrhage of the surrounding musculature was the only associated injury leading to spasm and pain secondary to the fracture. Early ice application and immobilization was used to control bleeding and to relieve pain. Moist heat, range of motion and progressive resistive exercises were begun as soon as pain would allow. Isokinetics muscle testing was done at 8, 18, and 28 weeks in order to monitor progress and assist in directing the exercise sessions. Peak torque deficits were greater in abduction and adduction than in flexion and extension. At 28 weeks peak torque deficits in abduction and extension at 60°/sec. were 14%. However, at 180°/sec., peak torque deficits in abduction and extension were 6% and 8% respectively while peak torque deficits in flexion and extension at 60°/sec. and 180°/sec. were less than 5%.

It should also be noted that the noninvolved shoulder was the player's dominant shoulder and also demonstrated improvement during the rehabilitation in all movements. Of the fractures of the neck of scapula reported by Armstrong et al. more than half had residual stiffness at six months (2). However, this player had full range of motion with no residual stiffness by 18 weeks.

Summary

Fractures of the scapula occurring in football are rare injuries. The present case demonstrates an injury that occurred as a result of a tackle in which the initial body contact was made with the helmet. The resulting force was concentrated over a small area and short duration of time and was sufficient enough to fracture the neck of the scapula. Initial management consisted of immobilization for five weeks, followed by moist heat and range of motion exercises and immobilization during non-exercise period for three weeks. At eight weeks, progressive resistive exercises were begun, preceded by moist heat and followed by ice application. Although the scapula is well protected, both anatomically and with shoulder pads, the injury is possible, especially when initial contact is made with the helmet. However, if there are no other associated injuries, good results can be obtained through conservative management.

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Table 1 Selected results of isokinetic muscle testing

	ABDUCTION			ADDUCTION			FLEXION			EXTENSION		
	8wk/18wk/28/wk											
60°/sec												
% Body Ratio (involved)	17	30	44	15	31	41	26	32	43	29	40	46
% Body Ratio (uninvolved)	38	37	44	33	39	47	35	38	44	42	41	54
Peak Torque Deficit	56	20	0	56	19	14	26	15	2	32	2	14
180°/sec.												
% Body Ratio (involved)	16	24	36	17	25	35	21	33	40	31	37	42
% Body Ratio (uninvolved)	28	29	37	32	36	38	34	38	38	39	44	45
Peak Torque Deficit	44	15	1	48	30	8	39	11	-4*	20	17	6
Total Work Deficit	50	14	9	62	27	0	62	14	4	35	4	3

*Peak torque was greater in the involved than uninvolved shoulder.



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Notes from the National Office

"To inform and update the membership on various subjects of interest and answer the most frequently asked questions."

REPLACEMENT JOURNALS/ BACK ISSUES

***The following is a reprint from the Spring 1984 issue. Due to many calls and letters inquiring about how these issues are handled, we are running this again.

REPLACEMENT JOURNALS

The policy for handling missing Journal claims due to address change is based on the stipulation that **an address change must be received in the National Office AT LEAST 30 days prior to publication** in order for a member to receive a gratis replacement issue. If upon checking the member's file, it is determined that the address change was received 30 days prior to date of publication, but due to computer lag the new address did not make the Journal mailing, then we send the replacement free of charge. If it falls into a "gray area", we give the member the benefit of the doubt and send the free replacement. If, however, the member did not send in the address change promptly, or if he/she did not instruct the post office as to mail forwarding (per our published request) then the responsibility for not having

received the Journal rests with the member and the usual replacement charge is made. Also, to clarify a question which sometimes arises, new members do not receive back issues. They will be on the Journal mailing list effective with the first issue published after joining the NATA - not retroactively.

BACK ISSUES

Back Issues of **ATHLETIC TRAINING** will be shipped upon receipt of confirmation of order and payment of the appropriate amount. Back issues are \$7.00 each to non-members, \$5.00 to members. This charge includes first class postage. At the present time the following issues are in stock:

1971	Winter (V.6#4)
1973	Fall (V.8#3) Winter (V.8#4)
1974	Fall (V.9#3) Winter (V.9#4)
1975	Fall (V.10#3) Winter (V.10#4)
1976	Summer (V.11#2) Fall (V.11#3) Winter (V.11#4)

1977	Summer (V.12#2) Fall (V.12#3)
1978	(V.13#2)
1979	Spring (V.14#1) Fall (V.14#3) Winter (V.14#4)

1980 through 1984 - all issues available at this time.

*Photocopies of specific articles from back issues will be supplied for \$1.00 per page. Contact Barbara Manning.

INSURANCE

***The National Office has been advised of an important new benefit under the Association's Group Term Life plan. During the policy year October 1, 1984 through September 10, 1985 the death benefit under the program will be increased 15%. There will be no additional charge; however, the increased coverage does not apply to dependents.

VISITORS

Other than Mary Brock Maloney and her husband, Patrick of Maryville, MO., the only visitors who braved our wind, ice and snow since our Winter issue was published were B.J. Parker, Ahoskie, NC; Pat Ezzell, Spring Hope, NC; Billy Hales, Pikeville, NC; and Walter E. Allen, Greenville, NC. If these last four names are unfamiliar to you it's probably because they have nothing to do with Athletic Training. They are auditors with the U.S. Postal Service who came for the annual audit of our mailing records. Everything was fine and you will be receiving the Journal for at least another year! With nicer weather coming soon we are looking forward to more of you dropping by to visit whenever you are in the area.

GRAFFITTI

***The National Society to Prevent Blindness has published a couple of booklets that you may be interested in ordering. One is a comprehensive publication on sports eye safety which gives good advice on how to protect your eyes. This is recommended especially for collision and contact sports players. The second booklet gives important up to date tips on the selection and purchasing of sunglasses, giving the consumer helpful information on how to make wise choices. A FREE copy of either (or both) may be obtained by writing to the Society at 79 Madison Avenue, New York, NY 10016. (Bulk orders cost \$15 per hundred for the eye safety booklet and \$8 per hundred for the sunglasses booklet.)

***Don't forget to remind your team physician that Advisory membership in the NATA would benefit him or her AND your Association.

***SAN ANTONIO — JUNE 7-11. Be there with boots on!!! +

1985 District Dues Structure

DISTRICT		CERTIFIED	ASSOCIATE	STUDENT	AFFILIATE	ADVISORY	ALLIED
District 1	CT, ME, MA, NH, RI, VT, Quebec	\$10.00	\$10.00	\$ 5.00	\$10.00	\$10.00	\$10.00
District 2	DE, NJ, NY PA	\$10.00	\$10.00	\$ 5.00	\$10.00	\$10.00	\$10.00
District 3	MD, NC, SC VA, WV, District of Columbia	\$ 5.00	\$ 5.00	\$ 3.00	\$ 5.00	\$ 5.00	\$ 5.00
District 4	IL, IN, MI, MN, OH, WI, Manitoba, Ontario	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00
District 5	IA, KS, MO, NE, ND, OK, SD	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00
District 6	AR, TX	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00
District 7 *	AZ, CO, NM, UT, WY	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00
District 8	CA, NV, HI	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00
District 9	AL, FL, GA, KY, LA, MS, TN	\$12.00	\$12.00	\$ 4.00	\$12.00	\$12.00	\$12.00
District 10	AK, ID, MT, OR, WA, Alberta, British Columbia, Saskatchewan	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00

**Schedule of Future Sites
and Dates
NATA Certification
Examination**

All regional sites are subject to a **minimum** of six candidates per site and limited to a maximum of **thirty** candidates.

Completed applications must be received in the Certification Office by the deadline for the date chosen. However, this does not guarantee the site and date selected. Applications are accepted and scheduled in order of receipt.

June 23, 1985 — DEADLINE FOR RECEIPT OF APPLICATIONS: May 13, 1985

New Britain, CT	Maryville, MO
Montclair, NJ	Houston, TX
Philadelphia, PA	Denver, CO
Raleigh, NC	Nashville, TN
Columbus, OH	Seattle, WA
Madison, WI	

July 14, 1985 — DEADLINE FOR RECEIPT OF APPLICATIONS: June 3, 1985

Boston, MA	Lawrence, KS
Harrisburg, PA	Costa Mesa, CA
Anderson, IN	Knoxville, TN
Holland, MI	

Application requests must be in written form. Telephone call requests cannot be honored. To obtain an application write to:



NATA Board of Certification
Application Request
1001 East Fourth St.
Greenville, NC 27834

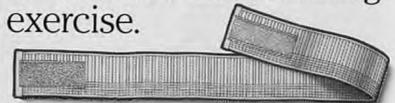
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Association Activities



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William Linskey Named for 1984 Distinguished Service Award

William F. X. Linskey will be awarded posthumously the American Orthopaedic Society for Sports Medicine's Distinguished Service Trainer Award. Established in 1981, the award is presented to an athletic trainer for outstanding service to sports medicine and to the athletic training profession. Previous recipients have been "Pinky" Newell in 1981, Otho Davis, 1982, and Fred Hoover in 1983.

A Cambridge, Massachusetts native, Mr. Linskey was graduated from Cambridge Latin High School, and earned his Bachelor's and Master's Degrees from Staley College. He got his start as a trainer by working as a volunteer with a semi-pro basketball team, and later was trainer for the Boston Olympics hockey team, 1937-1942. Linskey was the head trainer for Northeastern University football from 1939-1942. During World War II, Linskey served in England, France, and Germany as a rehabilitation and physical therapy specialist with the U.S. Army Medical Corps. On his return he was appointed head athletic trainer and R.P.T. for the City of Cambridge School Department, a position he held from 1946-1978. For several years he was an Associate Professor at Boston State College, teaching an athletic injury course at the graduate level.

Some of Bill's many awards and honors include his election to the NATA Hall of Fame, the Distinguished Service Award by the Massachusetts State Football Coaches Association and Massachusetts High School Basketball Coaches Association, trainer for the Pan American Games, and recipient of the first NATA Trainer's Merit Award. An NATA Undergraduate Scholarship is established in his name, and in 1979 Northeastern University created the William Linskey Scholarship Fund for students in athletic training. Bill was a charter member of the Eastern Athletic Trainers Association, and served as Secretary/Treasurer from 1950-1968, and President for 1969-70. He was featured on the "Today" and "Good Morning" television shows in 1977 and 1978.

William F. X. Linskey served the athletic training profession with distinction and dedication, earning the respect and admiration of athletes, coaches, administrators, and the community. Bill Linskey was thought of as an "institution," and, indeed, is truly deserving of

the Distinguished Service Trainer Award, the ultimate honor an athletic trainer can receive from his profession and colleagues. Bill passed away in the spring of 1984. The Distinguished Service Trainer Award will be presented to Mrs. Emma Linskey or a family representative at the AOSSM annual meeting in June 1985, and a \$2,000 donation will be presented in William Linskey's name to the NATA Scholarship Fund.

* * *

On December 4, 1984, Governor Thomas Kean signed Senate Bill 1295 entitled "The Athletic Training Practice Act." This action makes New Jersey the twelfth state to enact licensure for athletic trainers.

* * *

The New Jersey Athletic Trainers Society has instituted an award for its membership entitled the "Excellence in the Profession" award. This honor will be given annually to the member receiving the highest score based upon various criteria of professional activities.

* * *

The Illinois Athletic Trainers Association has inducted its first members into the new IAIA Hall of Fame. Mike Barnish, Elmhurst College, coordinates the nominations.

* * *

Ed Christman, former Journal Committee member of *Athletic Training*, and former Head Athletic Trainer at the College of William and Mary, has been promoted to Senior Product Manager, Elastics, within the BIKE Athletic Company, Knoxville, TN.

* * *

Reminder: Annual deadlines for submitting nominations and applications to District Directors for NATA awards:

1. AOSSM Distinguished Service Award - January 1.
2. NATA Undergraduate and Graduate Scholarship Awards - February 15.
3. Twenty-five Year and Hall of Fame Awards - February 15.
4. President's Challenge Award - February 15.
5. Distinguished Athletic Training Educator Award - April 15. +

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Members Certified in 1984

The Association is pleased to announce the following members who became certified in 1984. Congratulations to each of you.

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Editorial

Endodontics

Editorial Background from The American Association of Endodontists

Say the word endodontics and most people won't know what it means. Translate by saying root canal and the response most often is a wince.

Root canal therapy is so inextricably connected in the public's mind with pain, that most people would rather joke about it or simply change the subject than discuss it seriously. The truth about endodontics is that it saves teeth from extraction through a procedure that is usually no more painful than filling a tooth. Pain in the dentist's chair is a thing of the past. In the hands of a skilled professional, endodontic therapy today rarely hurts.

In one sense, though, the relationship between endodontics and pain is justified. Patients seeking the services of a root canal specialist, or endodontist, often are in pain. Endodontists are specially trained in the diagnosis of dental pain and in ending the toothache without sacrificing the tooth.

What Role Does Endodontics Play in Dental Health?

Endodontics might be compared to efforts in medicine to save damaged or diseased limbs or organs instead of removing them. No one would think of having a broken finger amputated even if it might not completely regain its original strength or mobility. Endodontic therapy allows patients to keep their teeth, even if they might not be quite as strong after treatment. A real tooth, just like a real limb, is always preferable to a prosthetic one. Endodontic therapy is performed on teeth that might otherwise be extracted for the following reasons:

Tooth decay exposes the inside of the tooth to bacteria in the saliva causing an infection.

Physical trauma or a blow to the tooth causes the tooth to crack or damages the nerves inside the tooth causing them to die.

Periodontal or gum disease weakens the support of the tooth, damaging the nerve.

Tooth capping requires a tooth to be cut or filed down and endodontic therapy may be needed to remove the nerves if they are damaged.

Accidental dislodgement of a tooth may require root canal therapy if nerves are damaged in the accident and the tooth is reimplanted.

Tooth discoloration can sometimes be reversed with a process called bleaching. Endodontic treatment is sometimes required because the bleaching process is done from inside the tooth.

What Is Endodontics?

"Endo" is the Greek word for within, and "dontia" means tooth. Endodontics is the dental specialty that treats the inside of the tooth or the tooth pulp — the soft, inner tissue comprised of nerves, blood vessels and lymph vessels. The pulp lies within the hard dentin, and extends from the crown of the tooth to the tip of the root, where it connects to the tissues of the jaw. When the pulp becomes infected, it often dies. Root canal therapy removes the dead or infected pulp and replaces it with a filling material.

When is Endodontic Treatment Needed?

The most common cause of pulp disease is tooth decay. When a tooth is badly decayed, the pulp becomes exposed to bacteria in the saliva and becomes infected. When the infection destroys the pulp, it becomes a source for further infection of the jaws. The pulp also can be damaged by physical trauma, such as a blow to the mouth. When a tooth is hit hard enough, the nerves are destroyed and the pulp dies even though the tooth may not be broken. Sometimes a tooth that is knocked out of the socket can be reimplanted if the treatment is rendered quickly. Root canal therapy is then needed to remove the damaged pulp.

Sometimes periodontal treatment requires amputation of the root of the tooth and endodontic treatment is needed to remove the pulp, which would be damaged by such a procedure. Periodontal or gum disease also affects the pulp if the disease enters the pulp chamber through the canals in roots of the teeth.

Endodontic treatment sometimes is needed in conjunction with the placement of caps or crowns on teeth. Before a tooth is capped, it has to be reduced in size. The pulp chamber may be exposed or the nerve damaged, so the nerve must be removed.

Teeth that have been discolored by chemicals or drugs can be whitened with a bleaching process. Sometimes the discoloration occurs internally and the bleaching agent is applied inside the teeth.

Why Does The Pulp Need To Be Removed?

If the damaged or diseased pulp is not removed, the tooth and surrounding tissues may become infected or inflamed. The most obvious and immediate result may be pain and swelling, although in about half the cases the injured pulp causes no pain. Without pain urging the patient to seek professional care, the untreated diseased pulp can eventually injure the bone that anchors the tooth in the jaw. As the infection or "abscess" worsens, the treatment becomes more difficult and the prognosis becomes less favorable. Eventually, the only alternative may be extraction of the tooth.

What Are The Symptoms of Pulp Disease?

Symptoms that may indicate the need for endodontic therapy are a tooth with prolonged sensitivity to heat or cold, as well as sweet and sour tastes. The tooth and surrounding area may feel sore to the touch and there may be swelling or a draining sore in the gum. Sometimes the tooth becomes discolored.

What Does Endodontic Treatment Involve?

During root canal treatment, the dentist removes the diseased pulp and carefully cleans out the pulp chamber and root canals. The dentist then fills the pulp chamber and root canals of the tooth with a substance that prevents bacteria from reentering the tooth. Root canal therapy usually is done in the following steps:

- The dentist may first test the tooth to see if the pulp is diseased by checking it for heat or cold sensitivity and pain accompanying chewing or tapping. X-ray examination also helps determine if the pulp is

Continued on page 46



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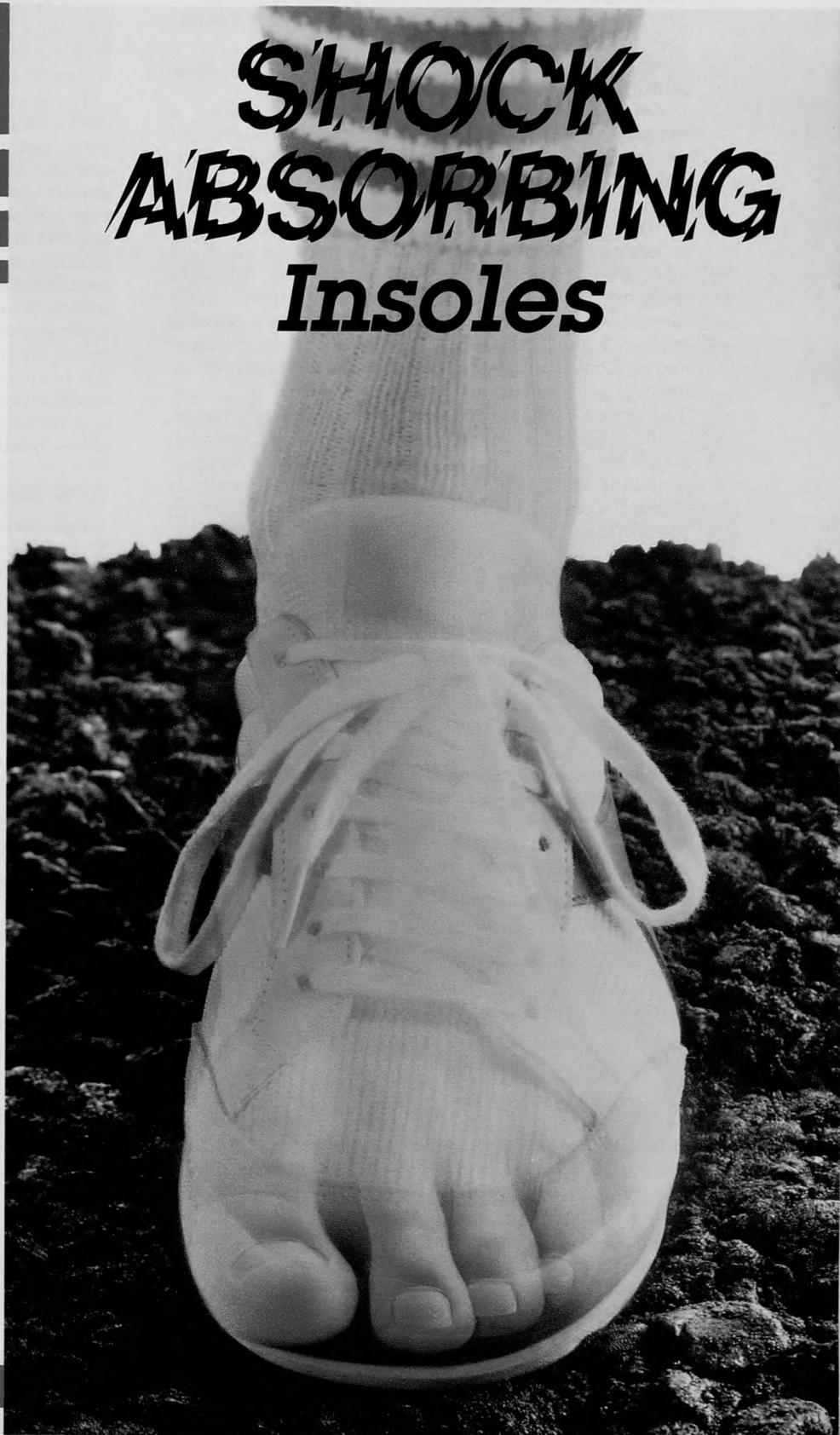
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- affected.
- A local anesthetic is given to numb the tooth if necessary.
- A device called a rubber dam is placed in the mouth when possible to isolate the tooth and to keep the area clean and dry during treatment.
- An opening is made in the crown of the tooth to gain access to the pulp.
- The entire pulp is removed and the root canals are cleaned and enlarged with tiny instruments called files. The root canals are rinsed out with fluid and shaped to a form that can be easily filled.
- When an acute abscess is present, the tooth is allowed to drain through the opening the dentist has made.
- Medication may be put in the root canals to help eliminate any bacteria.
- If the treatment is done in two or more visits, a temporary filling will be placed in the opening in the crown to protect the pulp chamber between appointments. Also, in the case of severe infection, antibiotics may be prescribed.
- When the tooth is not painful and all signs of infection are controlled, the root canal space is filled and sealed with materials that prevent bacteria from reentering. The solid filling material most often used is called gutta percha. It is a soft, pliable material that conforms easily to the root canal space. Root canal sealer cements are also frequently used in conjunction with solid materials.
- The crown of the tooth then is restored. Many times, gold or porcelain crowns are used when the tooth has been badly fractured or decayed. The type of material used will depend on where the tooth is located, tooth color and the amount of natural tooth remaining.

Who Performs Root Canal Therapy?

All dentists receive some instruction in root canal therapy in dental school. Endodontists are specialists who have additional training in the procedure and who limit their practices to root canal therapy. Many dentists prefer to refer patients to endodontists for root canal therapy. Other general dentists do routine cases, but refer emergency and complicated cases to an endodontist. The endodontist will send the patient back to the referring dentist to do the restorative procedures on the crown.

What Is An Endodontist?

An endodontist is a dentist who limits his or her practice to root canal therapy and procedures concerning the inner tissues of the tooth. An endodontist has two years additional formal training and/or has been certified by the American Board of Endodontics after passing a series of examinations. He or she is specially trained in diagnosing and treating dental pain and traumatic injuries to the tooth.

Why Not Just Extract The Tooth?

Extracting the tooth may seem like the quicker and easier solution, but it has many drawbacks. When a tooth is lost, the space has to be filled with a bridge or other teeth may shift, affecting chewing and biting efficiency. Placement of a bridge may involve the cutting of adjacent healthy teeth. These procedures may be considerably more expensive than root canal therapy and tooth restoration. Even though the dead or infected

pulp has been removed, the endodontically treated tooth is very much alive, nourished by surrounding tissue. A live tooth is invariably preferable to an artificial tooth or a bridge. The loss of a tooth means the loss of stimulation to the surrounding tissues, possibly leading to gum or periodontal disease and other problems. Endodontic treatment also causes fewer potential complications and less post-procedure pain than tooth extraction.

How Much Does Root Canal Therapy Cost?

The cost of endodontic treatment varies depending on the type of tooth. A molar with several root canals is more complicated than a single-rooted front tooth, for example. Teeth with more severe infections may be more expensive to treat. Fees also vary according to the cost of living in different geographical regions.

For example, endodontic treatment of one tooth, excluding the restorative crown, may range in cost from less than \$100 to more than \$500 depending on complications, the type of tooth, and geographical area of the country. Costs also vary slightly depending on what type of dentist performs the procedure. In general, endodontists charge slightly more, though general dentists sometimes charge more than specialists. The local dental society can be helpful in providing fee information in a particular community.

Most dental insurance will cover part of the cost of endodontic therapy, whether the procedure is performed by a specialist or a general dentist. Some health maintenance organizations (HMOs) will not pay for specialists, however, and insurance policies vary in their coverage of treatment.

How Long Does Endodontic Treatment Take?

Root canal therapy usually requires one to three visits. The trend is to completing the treatment in fewer visits. One-visit treatments are not uncommon, but two to three treatments are required more often. Each visit usually lasts from 30 minutes to an hour.

How Long Will The Endodontically-Treated Tooth Last?

The endodontically-treated tooth is more brittle, but it could last a lifetime if it is restored with a cap or crown and is properly cared for. Routine dental hygiene may be sufficient to keep the tooth healthy. That means thorough cleansing by brushing and flossing, proper diet and periodic dental checkups. Sometimes the tooth will need retreatment, but if the original therapy is done by an experienced and skilled dentist, this happens rarely.

Who is Most Likely To Have Root Canal Treatment?

Anyone with teeth is a potential patient. Every year about 10 million root canal procedures are performed. It is unclear whether more or less endodontic therapy will be performed in the coming years. On one hand, as a result of fluoride, tooth decay is less rampant than it once was and fewer teeth will need endodontic care. On the other hand, people are living longer and keeping their teeth longer, making it more likely that they eventually may require root canal therapy. People of all ages may be candidates for endodontic therapy. It was once thought that it should be performed only on young patients, but it's now known that age does not affect the healing process.

Is It Really Painless?

Yes, almost always. When the procedure is performed by a dentist who is well trained and experienced in treating complicated cases, there is very little discomfort. Unfortunately, many perceptions about endodontic therapy are based on those of earlier eras. With today's effective anesthetics, many patients report that the greatest discomfort is the anesthetic needle and the problem of trying to swallow while the dentist is working. Occasionally a patient will feel some discomfort from the actual procedure, but this is rare.

In some cases, endodontic therapy can even be done painlessly without anesthetics because the nerve of the tooth is dead. After the treatment, the tooth may be sore because the tissues surrounding it sometimes become inflamed. This discomfort can be controlled with analgesics.

What Changes or Improvements Are Being Made in Endodontics?

Today most endodontics use hand-operated instruments to clean the tooth. But powered instruments are also being used. Ultrasonic equipment is showing the most promise. It is designed to clean the canals faster and more thoroughly than hand instruments.

Researchers also continue to look for better filling materials. Gutta percha is believed to be the best available now, but other filling materials are being developed.

The American Association of Endodontists is a national organization of endodontic specialists and some general practitioners interested in the specialty of endodontics. The organization was founded in Chicago in 1943 to stimulate research, exchange ideas and otherwise set a high standard of practice.

The AAE consists of about 2,600 members from the United States and Canada and about 300 international members. In

Following are excerpts from news releases from the International Conference on Oral Trauma held in Dallas, TX November 8-10, 1984. The Conference, sponsored by

Severe Oral Trauma Need Leave No Permanent Damage

Sixteen-year-old Kathy was feeling terrific. Her braces had been off for only a few weeks and she was on her way to a party to show off her new smile. But her happiness did not last long. On the way home, a serious automobile accident threw Kathy against the steering wheel, shattering her new, expensive smile and her self-esteem along with it.

"A kid who has just gone through a few years of braces, and then falls and damages her teeth, thinks her world has come to an end, but it hasn't," said Dr. James Gutmann, a Dallas endodontist and program chairman of the International Conference on Oral Trauma.

Fortunately, Kathy suffered no life-threatening or permanently disabling injuries. But her jaw was fractured and several of her teeth were broken or knocked out. The greatest damage was done to Kathy's psyche, however. Fearing she would be permanently disfigured, she became depressed and refused to see visitors.

"Victims of severe facial injuries often envision a life as a recluse, thinking they will be too deformed to show

1956, the American Board of Endodontics was organized and incorporated in Illinois and in 1963 the House of Delegates of the American Dental Association recognized endodontics as a fully accredited specialty. The AAE is headquartered at 211 E. Chicago Avenue, Chicago, Ill. 60611.

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the American Association of Endodontics Endowment & Memorial Foundation, was attended by more than 300 dental specialists from 15 countries.

their face to the world," said Dr. Radman. "The fear of permanent disfigurement in most cases is unnecessary."

The psychological as well as dental aspects of treating the severely traumatized patients must be considered. Though dental emergencies are sometimes neglected in the face of more serious injuries, many severely traumatized patients insist on having their teeth repaired first. "I've had patients in my office whom I've had to send to the hospital because they had concussions," Dr. Radman said. "But they were more concerned about that smile."

Seventy percent of auto accident injuries are to the face and mouth. They are only some of the many severe facial injuries that occur every year. Victims of serious facial wounds are traumatized emotionally as well as physically. Most of these patients can be restored to their original appearance through plastic surgery and modern dental techniques.

Dentists Urge: Repair, Don't Extract Injured Teeth

Many accidents result in teeth that are cracked, broken and chipped. Often the victim's response is to

Continued on page 80



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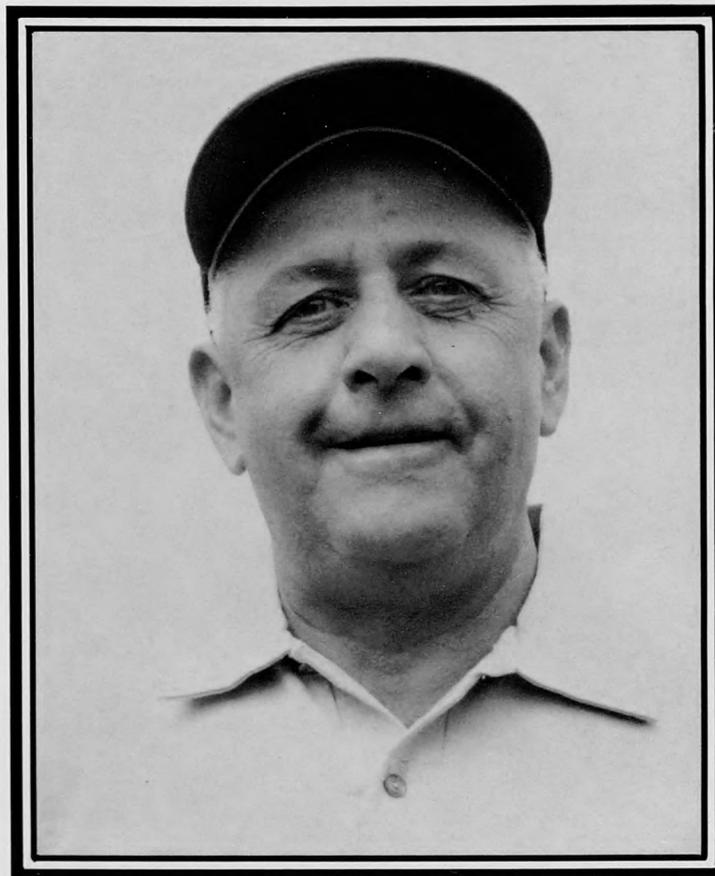
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In Memoriam



Joseph A. Blankowitsch, Jr.
February 19, 1911 - May 26, 1984

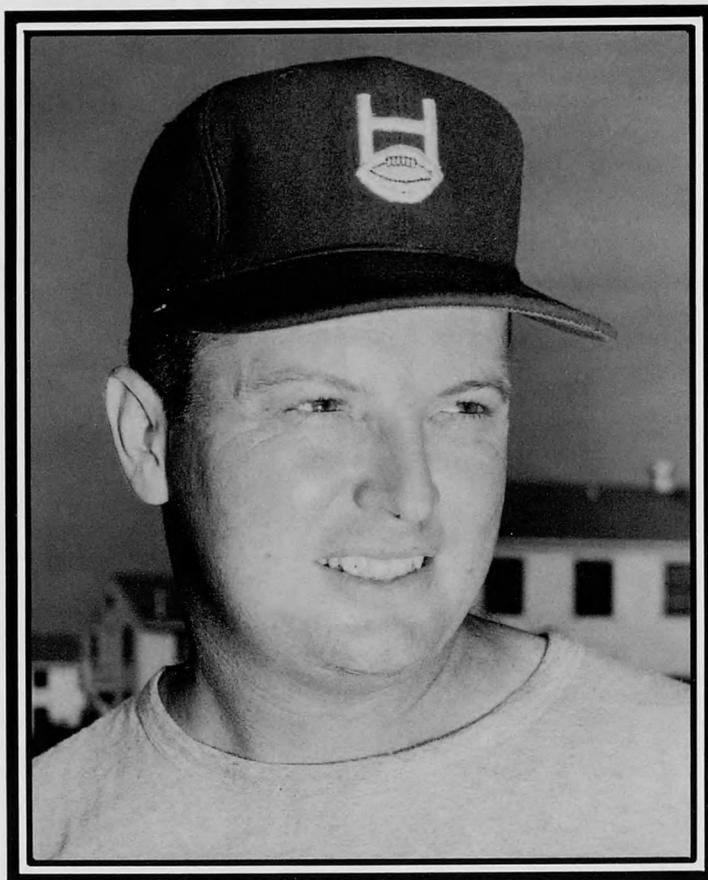
Mr. Blankowitsch was an athletic trainer for 31 years, most recently at Freedom High School in Bethlehem, Pennsylvania from 1967 - 1976. His previous positions were from 1945 - 1959 at Allentown High School, from 1959 - 1965 at Liberty High School in Pennsylvania.

Joe was registration chairman of the NATA National Symposium for 28 years, and was also visible at that position during those years at the EATA Conventions. He was a former president of the EATA. He was awarded the Cramer Eastern Athletic Trainer Award for outstanding service in 1974. In 1972 he received the NATA's highest honor, election to the Helms Athletic Foundation Hall of Fame.

Surviving are his wife Helen, daughter Patricia and two brothers, Alvin and Leo.

Joe will be missed as a trainer and for his service to the growth and operation of the NATA.

In Memoriam



Robert K. (Bobby) Brown
August 11, 1928 - February 20, 1984

Robert K. (Bobby) Brown died February 20, 1984 in Houston, Texas, after a six year battle with cancer.

Bobby's career as an athletic trainer began as a student at the University of Houston in 1946. He served as an assistant trainer for the Buffalo Bills Football Club - AAFC - Buffalo, N.Y. (1949) and the New York Football Yankees - NFL - New York, N.Y. (1950-51). He served as head trainer for the Ottawa Roughriders Football Club - CFL, in 1952 and the Winnipeg Blue Bombers Football Club - CFL in 1953. He accepted a new challenge in 1954 when he became the first trainer for the Houston Independent School District, a position he held for six years. In 1960 he became head trainer for the Houston Oilers Football Club - AFL/NFL and the Houston Aeros Hockey Club - WHA - from 1973 to 1978. At the time of his death he was serving as a consultant to the Houston Gamblers - USFL.

During the course of his career, Bobby was head trainer for five AFL - All-Star (Pro Bowl) games - 1961, 1962, 1968, 1969 and 1970; one WHA All-Star (hockey) game - 1975; two AFL championships (Houston Oilers) 1960 and 1961; one AFL Division championship (Houston Oilers) 1967; and two AVCO Cup - WHA championships (Houston Aeros) 1974 and 1975.

Bobby was active in his profession, serving as President of the Southwest Athletic Trainers Association in 1958; President of the NFL Athletic Trainers Society in 1968, 1969 and 1970 and President of the WHA Trainers Society in 1973-74. Bobby's expertise was sought out by the sporting goods industry where he served on the advisory staffs of Wilson Sporting Goods, Spaulding Sporting Goods and Rawlings Sporting Goods.

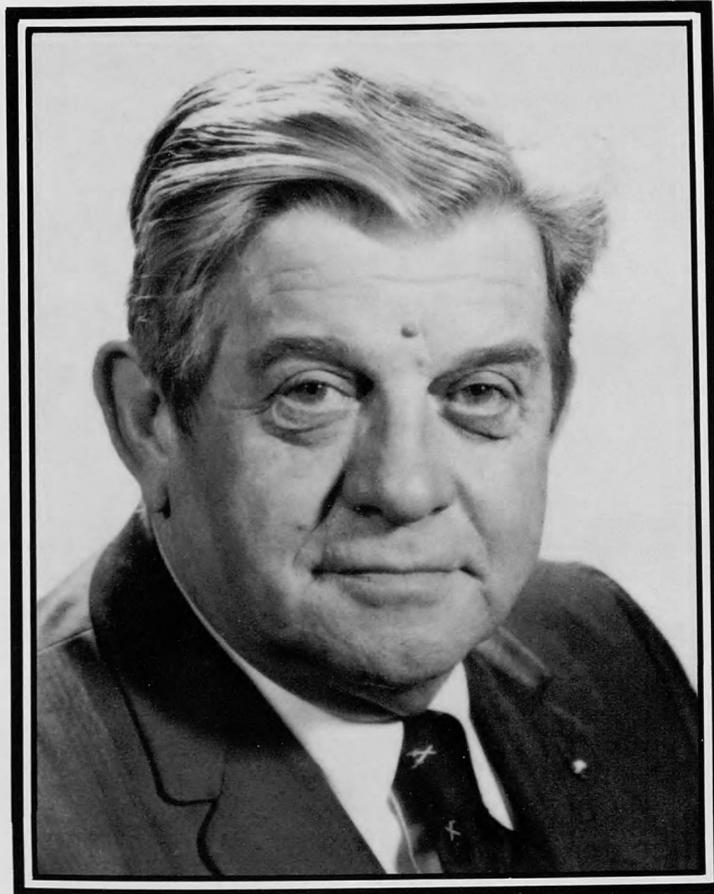
He was honored by his peers by induction into the National Athletic Trainers Hall of Fame in June of 1980.

In 1978, after discovering he had cancer, Bobby began working on a book about his experiences. "*Two Yellows and a Blue*" was published in 1982.

With a desire to continue to contribute his background and experience to athletes, Bobby, along with his close friend, Wayne Proseri, built the Bobby Brown Sports Medicine Center in Houston, Texas, in 1983. The Center opened a month before his death and continues in his memory.

Bobby will be remembered as an innovator and as one of the leaders in upgrading the skills and knowledge in the profession. He is greatly missed by all who knew him.

In Memoriam



Jay Colville
June 30, 1909 - November 7, 1983

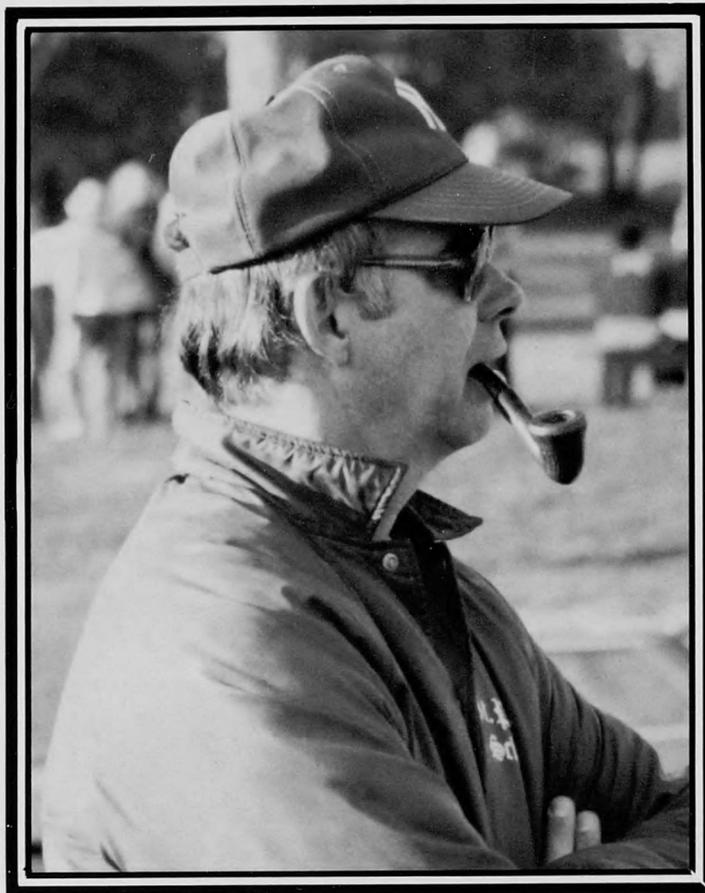
Jay Colville passed away Monday, November 7, 1983 at Jewish Hospital in Cincinnati, Ohio. Jay attended Miami University in 1921. During his undergraduate studies he became a student trainer. Upon graduation he served as Head Athletic Trainer until his retirement in 1970. In addition to being the first full-time trainer, he taught physical education classes, coached boxing from 1933-50, and wrestling from 1950-54. Since his retirement he served as Trainer Emeritus.

Jay helped establish the NATA, served as President of District 4 and was named to the Helms Athletic Trainer's Hall of Fame. He served as boxing trainer for the Olympic Games in Melbourne, Australia. He was also a member of the Butler County Hall of Fame and a charter member of the Miami University Hall of Fame.

Jay is survived by his wife, Bessie; a son, Dean; two daughters, Jeanette Davis and Jill Pomerantz; and five grandchildren.

Contributions may be made in his memory to the E. Jay and Bessie Colville Student Athletic Trainer Grant in care of the Miami University Alumni Association, Murstein Hall, Oxford, OH 45056.

In Memoriam



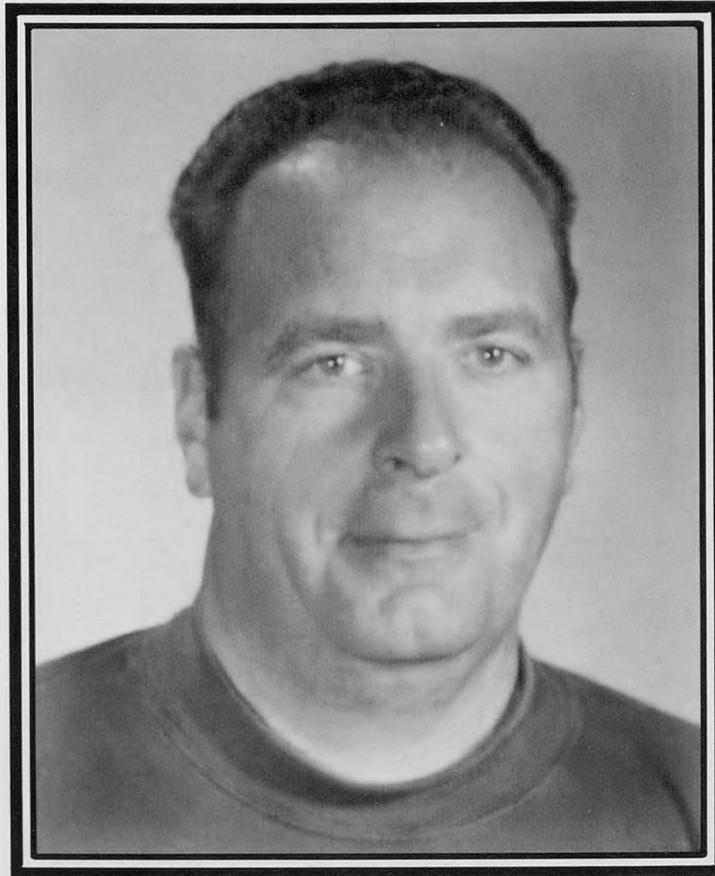
Ronald Harris
December 10, 1939 - November 2, 1983

Ronald Harris, head trainer since 1970 at St. Pauls School, Concord, New Hampshire, died of a brain hemorrhage on November 2, 1983. Ronald was formerly at Yale where he was a trainer for several years. He left Yale to become the head trainer at St. Pauls School where he served the students and faculty for 13 years. At the time of his death he had recently been appointed the Supervisor of the Infirmary and in addition to his training duties, taught CPR to students and community members.

Ronald enjoyed the outdoors and was an active hiker and cross-country skier. He was a dedicated trainer and will be missed by fellow colleagues, athletes, and friends.

Ronald is survived by his wife, Judy, and his children, Richard, Barry, and Megan.

In Memoriam



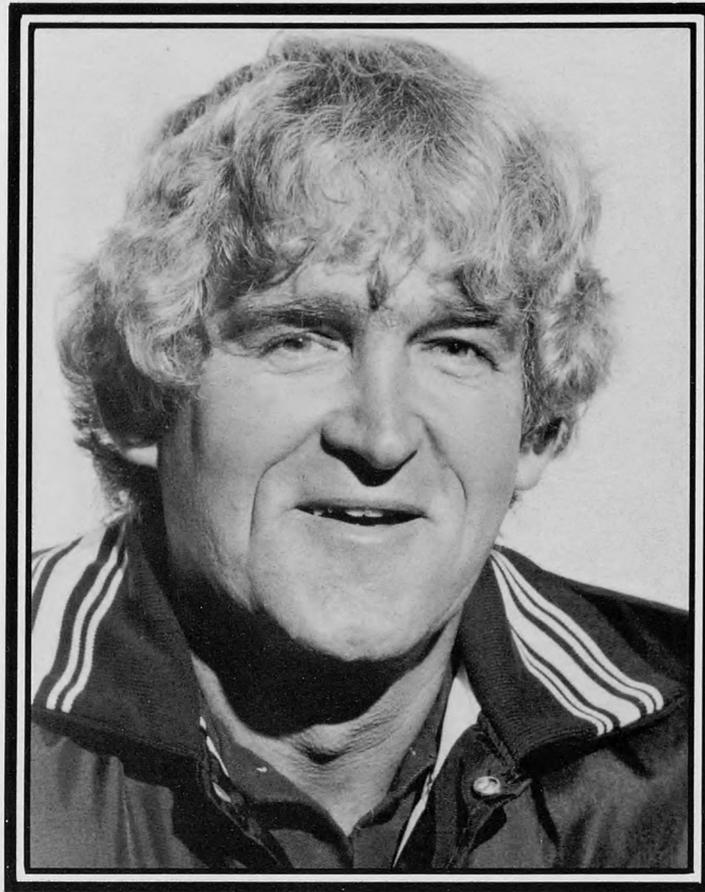
James Nolan
August 23, 1931 - December 13, 1983

James Nolan passed away in Green Bay, Wisconsin, December 13, 1983. He was born in Plymouth, Wisconsin in 1931. He received an undergraduate degree from Lakeland College and a graduate degree from the University of Wisconsin—Madison.

Jim taught and coached football at Wabeno High School and Casco High School before becoming the Head Athletic Trainer at St. Norbert's College. He also served as a part-time athletic trainer for the Green Bay Packers until illness caused him to retire.

James is survived by his wife, Jan; two sons, Steve and David.

In Memoriam



Dan Olesevich
August 16, 1937 - July 15, 1983

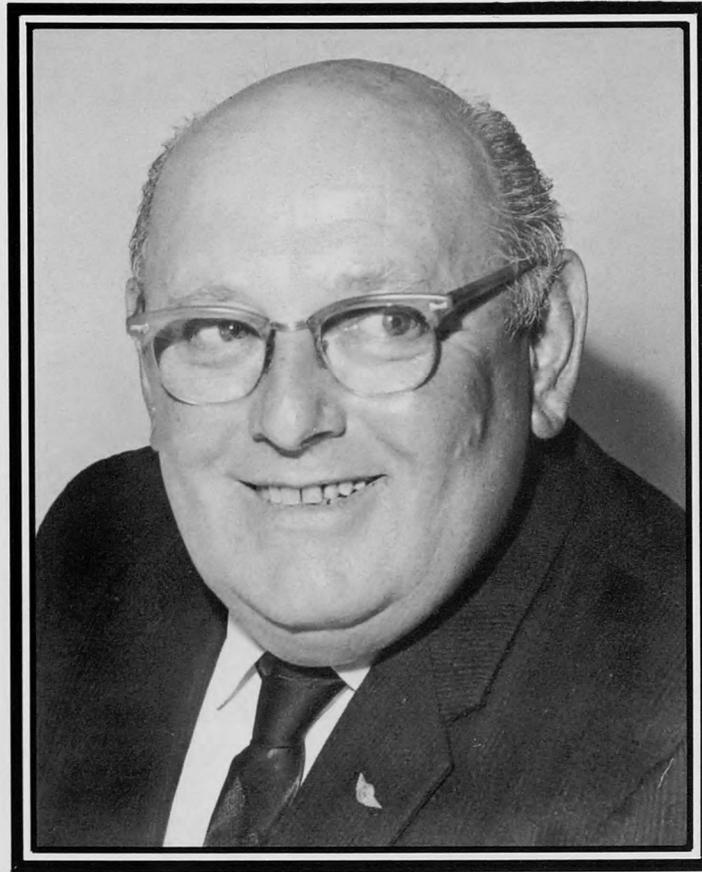
Dan Olesevich, former assistant athletic trainer and equipment manager for the Detroit Red Wings, was killed in an auto accident July 15, 1983.

Dan was a reserve goaltender during the Red Wings dominance in the 1950's. He became an assistant athletic trainer in 1958. Dan was instrumental in setting up the professional hockey Trainers' Association, serving as secretary-treasurer for most of the first ten years and as Vice-President for the last four years. He was trainer for the Wales Division during the 1980 All-Star Game.

Dan is survived by his wife, Gay, and two children, Mark and Kristine. They own a farm in Harrow, Ontario where Dan raised standardbred horses.

Dan was loved and respected by Detroit and all NHL Trainers.

In Memoriam



Henry Schmidt
September 21, 1905 - December 19, 1984

One of the pioneers of athletic training, Henry Schmidt, died after a lengthy illness in Santa Clara, California.

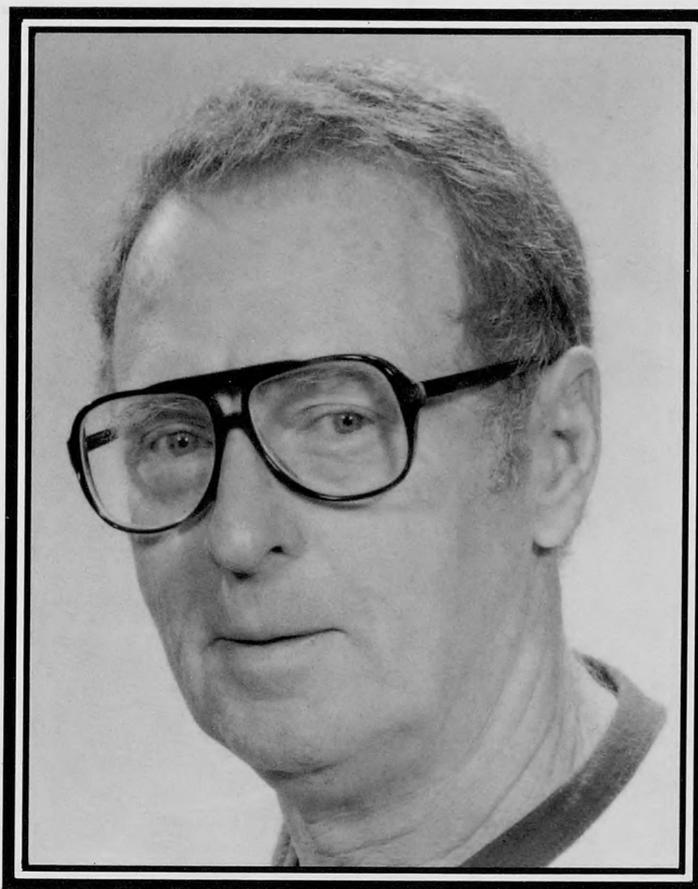
"Schmitty" was the trainer for the University of Santa Clara for fifty years, retiring in 1977. He was the trainer for Santa Clara in the 1936 and 1937 Sugar Bowls and the 1950 Orange Bowl. His fifty years included ten summers with the Los Angeles Rams, seven seasons with the San Francisco 49ers, thirty years with the East team of the East-West Shrine Bowl game and several seasons with the Golden State Warriors basketball team.

He was one of several founders of the Pacific Coast Trainers Association and helped found the NATA. His "walls of fame" included large photographs of the many All-Americans, professional players - football, basketball, baseball - and notables in swimming, golf, track, plus celebrities. The City of Santa Clara dedicated an 8.5 acre park in his honor on March 6, 1977. At the park center, his "wall of fame" is partially duplicated and a portion of his memorabilia is retained.

Schmidt is survived by his widow, Florence, and by two children, eight grandchildren and two great-grandchildren.

Remembrances are suggested to the Henry Schmidt Scholarship Fund for Athletic Trainers, Bank of America, 900 Lafayette Street, Santa Clara, California, 95050.

In Memoriam



Robert R. Spackman
December 18, 1916 - January 17, 1984

Robert R. Spackman died January 17, 1984. At the time of his death, he held Head Athletic Trainer and Associate Professor positions at Southern Illinois University in Carbondale, Illinois.

Bob received a bachelors degree from West Chester State, a masters degree from Southern Illinois University, and a physical therapy degree from the University of Pennsylvania.

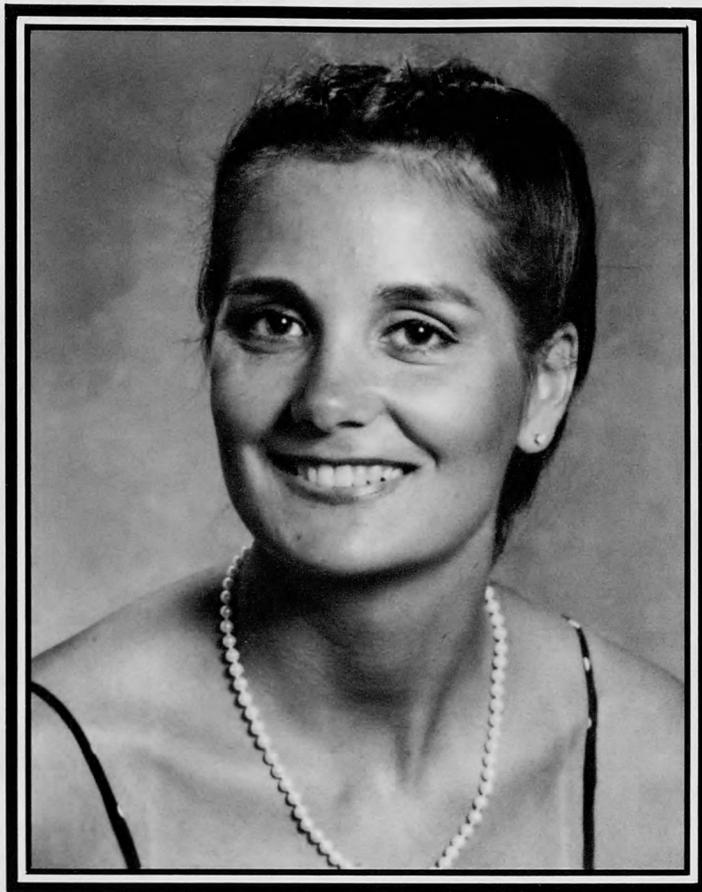
His career in athletics began as a professional baseball player in the early 1940's. Upon entering school, he served as a student trainer at West Chester State. After receiving his master's degree, Bob served as trainer for the St. Louis Browns and therapist at St. Anthony's Hospital. Before joining the staff at Southern Illinois University, he was Chief of Physical Therapy and Rehabilitation at VA hospitals in Coatsville, PA, St. Louis, and Knoxville, TN.

Bob wrote and published articles, many dealing with conditioning programs for various sports. He also held seven patents on exercise and testing equipment. Bob held memberships in the NATA, American College of Sports Medicine, A.A.H.P.E.R., N.R.P.T., and Professional Baseball Players Association.

He is survived by his wife, Jane; daughters, Jill, Jan, and Jennifer; son, Robbie.

Bob will be long remembered by the members of our profession for his many and generous contributions.

In Memoriam



Maureen Gail Stafford
March 3, 1955 - December 2, 1984

Maureen Stafford was Head Trainer at Oklahoma City University from January 1, 1984 until her tragic death in an automobile accident.

Born and raised in Southern California, Maureen attended San Diego State University where she achieved bachelors and masters degrees in physical education with special emphasis in physical education for the handicapped and athletic medicine. She was a teacher in the San Diego City Schools and the El Cajon School District in the Orthopaedic School for the Handicapped. She also was assistant trainer at San Diego State University and the University of San Diego. She was to have served as a trainer for both the National Sports Festival in Baton Rouge in July of 1985 and the World University Games in Cortina, Italy in February of 1985.

In the short time at Oklahoma City University Maureen is credited with using her determination and organizational skills to create an excellent facility from what was previously a tiny dumpy room. She developed a student trainer curriculum and used her exceptional teaching skills to raise the level of knowledge of athletic training concepts in those around her.

She exemplified the new young trainer with her enthusiasm, determination, and dedication in combining research and current training techniques in the compassionate care of her athletes.

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10-14 Spring Sports Symposium, Punta Gorda, FL. Contact Cybex Center USA, Education Division, 505 King Street, Suite 1, La Crosse, WI 54601.

14-16 District 4 Athletic Trainers Meeting, Merrillville, IN.

15-17 District 5 Athletic Trainers Meeting, Lincoln, NE.

15-17 District 7 Athletic Trainers Meeting, Flagstaff, AZ.

16-17 District 10 Athletic Trainers Meeting, Boise, ID.

16 Professional Football Athletic Trainers Society, Washington, DC. Contact John LeGear, Carl Byior & Associates, 401 N. Michigan Avenue, Suite 770, Chicago, IL 60611.

18 Physical Fitness Specialist Course, Dallas, TX. Contact The Institute for Aerobics Research, 12200 Preston Road, Dallas, TX 75230.

23-24 3rd Annual Athletic Training Update, Denver, CO. Contact Carole Vande Koppel, Tri-County District Health Department, 3265 W. Girard, Englewood, CO 80110.

25-29 Group Exercise Leadership Course, Dallas, TX. Contact The Institute for Aerobics Research, 12200 Preston Road, Dallas, TX 75230.

27 Sixth Annual Bridgeport Sports Medicine Symposium, Bridgeport, CT. Contact Robert A. Stanton, 325 Reef Road, Fairfield, CT 06430.

30 Professional Football Athletic Trainers Society, New York City. Contact John LeGear, Cary Byior & Associates, 401 N. Michigan Avenue, Suite 770, Chicago, IL 60611.

30-31 The 1985 Annual NE Athletic Injury Conference, West Springfield, MA. Contact I. R. Desrosiers, Human Services Training Institute, Springfield College, Box 1567, Springfield, MA 01109.

April

8-12 Physical Fitness Specialist Course, Dallas, TX. Contact The Institute for Aerobics Research, 12200 Preston Road, Dallas, TX 75230.

11-14 Stress and Behavioral Emergencies, Catonsville, MD. Contact Jeffrey T. Mitchell, Emergency Health Services Department, University of Maryland Baltimore County, Catonsville, MD 21228.

12-13 Eighth Annual Sports Medicine Symposium, Madison, WI. Contact Sarah Z. Aslakson, 465B WARF Building, 610 Walnut Street, Madison, WI 53705.

12-13 5th Annual Sports Medicine Seminar, Pensacola, FL. Contact Garth Grove, Sacred Heart Hospital, 5151 N. 9th Avenue, Pensacola, FL 32504.

13-14 Sports Medicine Update '85, Los Angeles, CA. Contact Vickie Zomar Beckwith, National Athletic Health Institute, 575 E. Hardy Street, Inglewood, CA 90301.

15-19 Group Exercise Leadership Course, Dallas, TX. Contact The Institute for Aerobics Research, 12200 Preston Road, Dallas, TX 75230.

18-20 Comprehensive Care of the Recreational and Competitive Athlete, Pittsburgh, PA. Contact The American Orthopaedic Society for Sports Medicine, 70 West Hubbard Street, Suite 202, Chicago, IL 60610.

17-21 AAHPERD Centennial National Convention & Exposition, Atlanta, GA. Contact AAHPERD, 1900 Association Drive, Reston, VA 22091.

19-21 Orthopaedic Spinal Exam and Treatment Course, La Crosse, WI. Contact Orthopaedic and Sports Physical Therapy, 505 King Street, Suite 001, La Crosse, WI 54601.

29-30 14th Annual Medical Aspects of Sports Symposium: Prevention of Sports-Related Injuries. Contact Joy Greene, Continuing Education, College of Medicine, University of Kentucky, Lexington, KY 40536-0086.

29-May 1 Texas Emergency Medicine Symposium, San Antonio, TX. Contact Ruth Hargrove Dean, Texas Chapter ACEP, PO Box 610717, Dallas, TX 75261-0717.

May

1-4 Physiology of Fitness, Orlando, FL. Contact Alan Varraux, MD, 60 W. Columbia Street, Suite F, Orlando, FL 32806.

17-18 District 3 Athletic Trainers Meeting, Virginia Beach, VA.

18-19 Sports Physical Therapy Competencies Course I, La Crosse, WI. Contact Orthopaedic and Sports Physical Therapy, 505 King Street, Suite 001, La Crosse, WI 54601.

18-19 Colorado Athletic Trainers Association Clinical Symposium and Business Meeting, Colorado Springs, CO. Contact Ed Seiler, Denver Broncos, 5700 Lincoln Way, Denver, CO 80216.

18-19 Pennsylvania Athletic Trainers Society 5th Annual Meeting and Clinical Symposium, Harrisburg,

PA. Contact Joan E. Maser, Department of Athletics, Carnegie-Mellon University, Pittsburgh, PA 15213.

23-29 Radiographic Assessment, Hawaii. Contact Cynthia L. Dotto, AAOSPT, 3849 Stirrup Drive, Erie, PA 16506.

24-26 Advanced Cybex/Isokinetic Course, La Crosse, WI. Contact Orthopaedic and Sports Physical Therapy, 505 King Street, Suite 001, La Crosse, WI 54601.

26-29 American College of Sports Medicine 32nd Annual Meeting, Nashville, TN. Contact ACSM, PO Box 1440, Indianapolis, IN 46206.

31-June 2 Annual Meeting for International Society for Professional Hypnosis, Cleveland, OH. Presentations and papers to be published in the Annual Review of Hypnosis requested. Contact Roger A. Straus, Division of Social Sciences, Alfred University, Alfred, NY 14802.

June

7 Athletic Training Educators Workshop, San Antonio, TX. Sponsored by NATA Professional Education Committee.

7-11 NATA Convention, San Antonio, TX. Contact National Athletic Trainers Association, 1001 E. Fourth Street, Greenville, NC 27834.

9-12 Cyriax Workshop on Evaluation and Treatment of Soft Tissue Injuries; Lower Back, Hip and Ankle, West Hartford, CT. Contact Richard Cote, Head Trainer, University of Hartford, 200 Bloomfield Avenue, West Hartford, CT 06117.

9-12 Orthopaedic Medicine Seminar — Evaluation, Treatment and Biomechanics of the Knee, Ankle and Foot, West Hartford, CT. Contact Richard Cote, University of Hartford, 200 Bloomfield Avenue, West Hartford, CT 06117.

12-14 Sports Medicine Symposium, Huron, OH. Contact Center for CME, The Cleveland Clinic Educational Foundation, 9500 Euclid Avenue, Room TT3-101, Cleveland, OH 44106.

15-21 Big League Baseball Sports Medicine Conference, Reno, NV. Contact J. Andrew Cameron, MD, 945 Dennison Drive, Reno, NV 89509.

19-22 The Art and Science of Sports Medicine, Charlottesville, VA. Contact Joe Gieck, UVA, PO Box 3785, Charlottesville, VA 22903.

21-23 District 8 Athletic Trainers Meeting, San Diego, CA.

22 Basic Cybex/Isokinetic Course, La Crosse, WI. Contact Orthopaedic and Sports Physical Therapy, 505 King Street, Suite 001, La Crosse, WI 54601.

23-27 Sixth World Congress in Sport Psychology, Copenhagen, Denmark. Contact ISSP c/o Dis Congress Service, 48, Linde Alle, DK 2720, Vanlose/Copenhagen, Denmark.

24-27 3rd Annual Sports Medicine Workshop, "The Upper Extremity", Boston, MA. Contact Office of Continuing Education, Tufts University of Medicine, 136 Harrison Avenue, Box 36, Boston, MA 02111.

1985 DISTRICT MEETINGS

District 3 (MAATA)	May 17-18, Virginia Beach, VA
District 4 (GLATA)	March 14-16, Merrillville, IN
District 5	March 15-17, Lincoln, NE
District 6 (SWATA)	July 25-27, Waco, TX
District 7	March 15-17, Flagstaff, AZ
District 8 (PCATA)	June 21-23, San Diego, CA
District 9 (SEATA)	June 27-29, Suwanee, GA
District 10 (NWATA)	March 16-17, Boise, ID

Contact the District Secretary for further information on these listings.

24-27 Sports Medicine/Athletic Training Clinic, Boston, MA. Contact Dr. Alfred Roncarati, University of Massachusetts at Boston, Division of Continuing Education, Downtown Center, Boston, MA 02125-3393.

27-29 District 9 Athletic Trainers Meeting, Suwanee, GA.

28 Clinical Application of Isokinetics, Boston, MA. Contact Dr. Alfred Roncarati, University of Massachusetts at Boston, Division of Continuing Education, Downtown Center, Boston, MA 02125-3393.

29 Building Explosive Power for Sport, Boston, MA. Contact Dr. Alfred Roncarati, University of Massachusetts at Boston, Division of Continuing Education, Downtown Center, Boston, MA 02125-3393.

28-30 National Strength and Conditioning Association 8th Annual Convention, Dallas, TX. Contact Karen Keller Brown, NSCA, 251 Capitol Beach Blvd. Suite 12, PO Box 81410, Lincoln, NE 68501.

1983 Cramer Athletic Trainer Workshops. Contact Cramer Products, Inc., PO Box 1001, Gardner, KS 66030.

Coaches Workshops

May 27-31 New Mexico University Albuquerque, NM	June 23-26 University of Florida Gainesville, FL
June 2-6 Arkansas State University State University, AR	June 23-27 Montclair State University Upper Montclair, NJ
June 16-20 University of Oregon Eugene, OR	June 23-27 University of Pittsburgh Pittsburgh, PA
June 16-20 Washburn University Topeka, KS	July 7-11 Butler University Indianapolis, IN

June 16-20
University of Georgia
Athens, GA

July 7-11
Southwest Texas University
San Marcos, TX

July 28-31
Grand Valley State College
Allendale, MI

July 28-31
Oregon State University
Corvallis, OR

Student Trainer

June 2-5
Eastern Kentucky University
Richmond, KY

June 23-26
Kent State University
Kent, OH

June 2-5
Oklahoma State University
Stillwater, OK

June 30-July 3
Kean College
Union, NJ

June 16-19
Florida State University
Tallahassee, FL

July 7-10
Austin Peay State University
Clarksville, TN

June 16-19
Southwest Missouri State
Springfield, MO

July 7-10
University of Rhode Island
Kingston, RI

June 23-26
Emporia State University
Emporia, KS

July 7-10
Northern Illinois University
DeKalb, IL

June 23-26
Arizona State University
Tempe, AZ

July 14-17
University of Texas/Arlington
Arlington, TX

June 23-26
Indiana University
Bloomington, IN

July 21-24
Castleton State College
Castleton, VT

June 23-26
University of Northern
Colorado
Greeley, CO

July 21-24
Bloomsburg University
Bloomsburg, PA

July 28-31
Drake University
Des Moines, IA

August 11-14
Seattle Pacific University
Seattle, WA

Advanced Student Trainer Workshops

June 2-5
Eastern Kentucky University
Richmond, KY

July 7-10
University of Colorado
Boulder, CO

June 23-26
Kent State University
Kent, OH

July 7-10
Wichita State University
Wichita, KS

June 30-July 3
Illinois State University
Normal, IL

July 14-17
University of Texas/Arlington
Arlington, TX

Athletic Training will list events of interest to persons involved in sports medicine, providing the information is received **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.+

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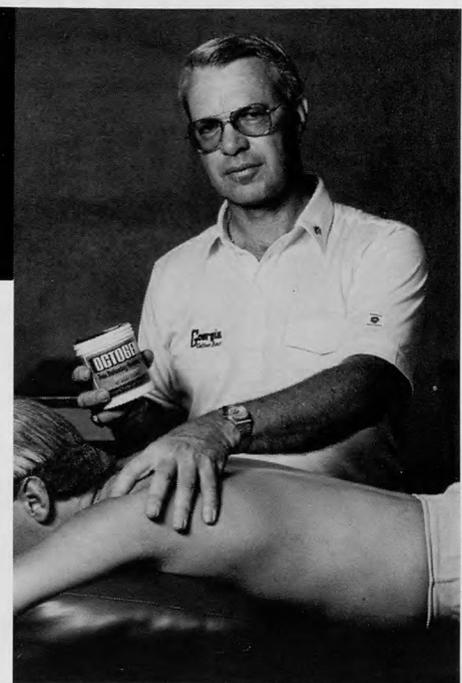
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Eastern Illinois University
Charleston, IL 61920

Cybox/Orthotron Accessory Organization

By Stephen A. Black, MEd, ATC

Cybox equipment has gained increased popularity in high school, college and sports medicine facilities around the world. The research and design professionals at Cybox are continually revising and updating the Cybox System and adding new attachments. If these attachments and adaptors are randomly scattered throughout the facility, they give the appearance of a cluttered, unorganized facility, to say nothing of the increased potential for damage to the parts or for an individual to step or trip over them.

A simple solution to the dilemma of where to store these parts and still allow easy access, is a peg board mounted on the wall within easy reach of the Cybox or Orthotron equipment. The peg board, with an outline of each input adaptor, organizes your operation without using excess floor space, which is limited in many facilities.

The peg board can be mounted on a frame of 2 x 4's for increased stability. This also allows easy access for inserting the various hooks which hold the attachments. The peg board is held in place with either lagg or molley bolts. The cost averages \$35/peg board installed.

The recommended dimensions of the Cybox/U.B.X.T. peg board are 4' x 4". The recommended dimensions of the Orthotron I peg board are 3' x 3'.

The Orthotron II comes with a vacuum formed panel for its various adaptors. If space is not a consideration, Cybox has a Cybox II/U.B.X.T. Accessories Cart available for purchase. List price is \$580.

Wright Line Study Finds VDTs Aggravate Pre-Existing Visual Characteristics

News From Wright Line

WORCESTER, Mass. (July 14) — Video display terminals do not cause serious temporary or permanent eye pathology, but constant use may aggravate visual irregularities already present in VDT users, reports a one-year study released today.

The findings of the Wright Line report are similar to those released by the National Academy of Sciences, which show that there is no evidence that VDT's cause permanent eye damage or increase the risk of cataracts. However, the Wright Line study shows incidence of eye strain in connection with VDT use appears to increase

for those with lightly pigmented irides, minimal uncorrected refractive errors, mild muscle imbalance and decreased tear production.

The study determined that poor physical work environments also contribute to increased symptoms, as do heightened anxiety levels.

The Wright Line study followed "dedicated" VDT users (i.e. at least 30 hours per week) in the company's data and word processing departments for one year. Three separate eye examinations, including refraction testing, muscle balance, stereo acuity, color vision and Schirmer testing, were performed. All operators were found to have refractive errors at the beginning of the study.

The report recommends yearly ophthalmologic examinations for employees spending more than 50 percent of their workday at VDTs. Grey-tinted lenses should also be encouraged to ease the strain caused by fluorescent lighting used in most work areas. Individuals with light iris pigmentation were found to have a greater sensitivity to the glare often associated with VDTs.

Second, the study recommends that ergonomically designed work places be provided to offer a better working environment for VDT operators. Good lighting, adequate air circulation, covered windows (to prevent glare) adjustable terminal workstations and chairs, and non-glare screens for VDTs should all be considered.

Finally, the study suggests that the commonly accepted three-month probationary period, during which the employee is evaluated, might also be a good time for new VDT operators to evaluate the pressures or environmental factors indigenous to the job.

Walking Stress

May, 1984 Good Health Digest

1,000 to 3,000 miles are walked by the average person annually, according to estimates. And, with each step, the foot must bear pressure of approximately three times the person's body weight.

Not-So-Innocent-Aspirin

October, 1983 Good Health Digest

"Take two aspirin and call me in the morning" may not necessarily be the best medical advice for simple heart ailments, in the opinion of one New York physician.

For occasional headaches, muscular aches and minor arthritic pain, aspirin often is a good pain reliever, if it is taken properly, according to Dr. Michael Irwin. For fastest relief he recommends using aspirin before pain settles in.

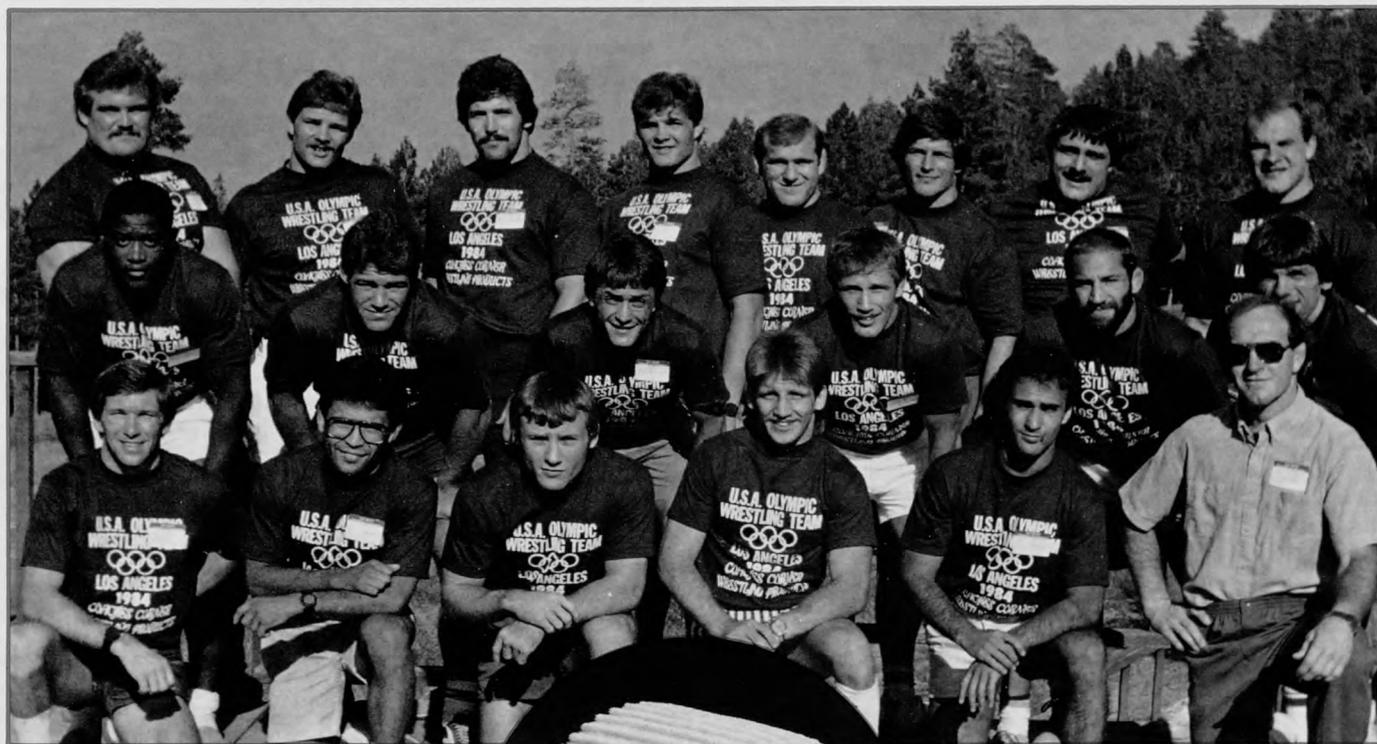
But Irwin warns that "aspirin can be dangerous." It should not be taken by people with a history of stomach bleeding or gastric ulcers without medical supervision. Since aspirin can disturb normal clotting mechanisms and cause internal bleeding, similar caution should be advised for people with a blood clotting problem or for those who must take anticoagulants.

"When used to reduce a fever, aspirin should be taken only when the fever is high and the patient has considerable discomfort", Dr. Irwin said. "Many people think of fever as a disease that must be treated; they do not understand that it is, rather, a symptom. If the infection is mild, with only slight fever, the disease is often self-limiting and usually nothing should be done to lower a raised temperature." Aspirin also should be avoided during pregnancy, Dr. Irwin advises, especially during the final three months. "It can slow down the actual pregnancy and even prolong labor, as well as

Continued on page 82

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Student Trainer Corner



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A Consideration of Ultrasound

Mark Cairns

A day never goes by without the ultrasound machine being turned on and used in the treatment of an athletic injury at the University of Kansas training rooms. It is one of the most widely used pieces of equipment found in the training room. But how does this magnificent machine create and produce this magic of healing? Is it dangerous? What can ultrasound be used for? This paper will try to clear the air about ultrasound.

The most often used frequencies in physiotherapy are between 1-3 MHz with intensities between 0.25 and 3 W/cm². The transducers vary in size from 4.5-12.5 cm². The duration of each treatment is 3-5 minutes, having 10 treatments for the injury (3). If no response is seen after 20 treatments, a change in the type of treatment should be made. It may also take 3 to 5 treatments to get any effect. One treatment should be done per day. Aldes (1) agrees with this report, but states that the frequency should be between 800,000 and 1,000,000 cycles/second for modalities of ultrasound. Hoghlum (2) agrees with Aldes, that this be the advised frequency. It is agreed by all, that depending on the complexity of tissue being irradiated, that the ultrasound wave will penetrate 3.5-4.5 cm. deep (1,2). The more bulky a person is, may mean that the intensity may need to be higher, so that the correct response will be achieved (1). Also, the more chronic the injury, the higher the intensity should be (2).

According to the preference of the athletic trainer, continuous or pulsed ultrasound is used in the training room. Lehmann and Krusen (4) have shown that there is no difference between pulsed and continuous wave machines. The only possible difference is that the pulsed ultrasound does not increase heat in one area as much as the continuous ultrasound may. It was also explained in the research, that the effective temperature ultrasound should be used at is 313-318 K; therefore, a steam pack or other heat source, should be applied to the area before ultrasound is given. (4)

Because air is not a good propagator of ultrasonic wave, a coupling medium must be used to keep air out of the system. Aldes (1) suggests that the best coupling medium to use is a petroleum based substance. Aldes (1), Summer and Patrick (5) advise using water, mineral oil, glycerine, and propriety jelly for a coupling medium.

There are two general methods used while administer-

ing ultrasound. The first one is the direct method. This method is usually performed on smooth surfaces of the body, and the sound head is in contact with the skin through a coupling agent like massage lotion or mineral oil. The other method is the indirect method. This method is used where an irregular surface is irradiated while being immersed in water. The sound head is in the proximity of the surface being irradiated but not touching the surface (1). The sound head should be moved over the area, so that the whole surface is uniformly treated. Burning of the patient is also eliminated if the sound head is moved. Moving the sound head in 1 to 2-inch circles overlapping 50% and moving 1-inch linearly, will provide sufficient coverage of area being treated (2).

Ultrasound will effect the body in many ways, and help some healing processes to occur. A list of these follows: decrease pain, decrease muscle spasm, increase blood flow, increase lymph flow, increase metabolism, increase connective tissue extensibility, and stimulate inhibition of nonbacterial inflammation, reabsorption of adhesions and calcific deposits, breaking up of hematomas, and most effectively treating inflammatory tissue such as bursitis, spinal arthritis, rheumatoid arthritis, deep pathologies, tendinitis, dermatological ulcers, keloids, and operative scars (2).

There are some instances where ultrasound is contraindicated. First, if the ultrasound starts to make the athlete ache or burn, the intensity may be too high or the sound head is not moving fast enough and periosteal burn is being produced. If this happens, the intensity should be turned down because the comfort and well-being of the athlete is always considered when administering any treatment. Treatment areas that are contraindicated for ultrasound are the brain, eyes, thyroid, stellate ganglion (which is in the neck region), cardiac area, parenchymal organs (such as the spleen and liver), spinal column, and reproductive organs. Pregnancy, presence of benign and malignant tumors, tuberculosis, brachiectasis, fractures, and thrombophlebitis are other conditions that are contraindicated. Precaution areas are the sternum, scapula, bony prominences, and epiphysis of the juvenile bone (1).

Because ultrasound is used so frequently in athletic

Mark Cairns is a student trainer at the University of Kansas.

Continued on page 86

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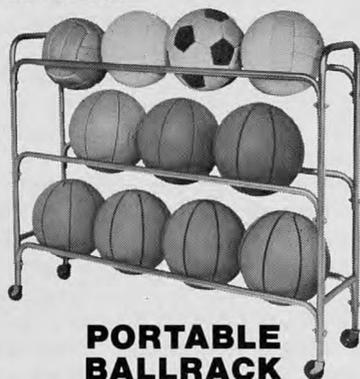
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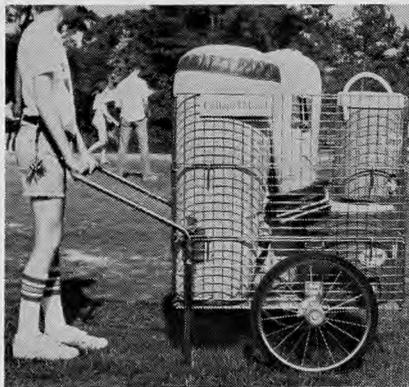
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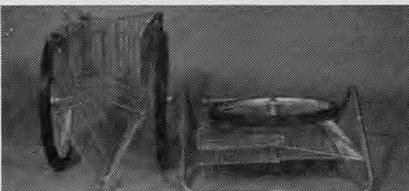
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36th Annual Meeting



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Abstracts



John Wells, ATC, PT, PhD
UNC-Asheville
Asheville, NC 28804

"Achilles tendinitis and peritendinitis: Etiology and treatment," D. B. Clement, MD, et al., *The American Journal of Sports Medicine* 12: 179-184, 1984.

Achilles tendon disorders are a nemesis to both the athlete and the physician. The purposes of this paper are to present the results of conservative treatment of 109 runners with overuse injury to the achilles tendon and to discuss the implications of functional overpronation as an etiological factor in this condition. Most runners presented with symptoms of gradual evolution of pain and swelling in the achilles tendon 2 to 3 cm. proximal to the insertion at the calcaneus. The alignment of the tibia, heel, and forefoot were measured and classified as exhibiting an unremarkable, mild, moderate, or severe degree of varus alignment. All patients followed a daily program of strength and flexibility exercises, modified rest, and/or an orthotic device to control foot biomechanics. Achilles tendinitis can be managed with excellent results in the majority of patients. Functional overpronation may play a role in the etiology of this overuse injury by promoting microtrauma with possible vascular blanching within the tendon.

May L. Yahara

* * *

"The Use of Anti-inflammatory Drugs in Sports Medicine," Michell, Lyle J., MD and Lacouture, Peter G., *Medical Times: The Journal of Family Medicine* 4: 3FM-8FM, April, 1984.

Injuries involving joint, ligament, and tendon aberrations are strong candidates for anti-inflammatory drug therapy. Anti-inflammatory agents can be divided into two major groups: steroidal agents and nonsteroidal agents. Both groups have fairly well-defined indications and limitations, but it is the nonsteroidal anti-inflammatory drugs (NSAIDs) that have been investigated most extensively for their use in sports medicine. Adverse or side effects which occur with chronic usage and acute administration, are of concern. While the steroids have fewer and milder acute undesirable effects, their long-term action is much more devastating. There are far-reaching effects of long-term steroid use that alter many systems. The NSAIDs also have less well-recognized long-term effects. Indications for anti-inflammatory drug intervention are mostly empiric in nature. Still, indications for their use is connected primarily with the extent and duration of the injury. Injuries in sports can

be divided conveniently into two major classes, based on their chronicity. Injuries that are a result of a single episode of microtrauma, such as a cross-body block in football or a twisting fall in basketball, are classified as single-impact microtrauma injuries. The second major class of sports injuries, overuse injuries, are the result of repetitive microtrauma, such as the constant impact of football in distance running, repetitive shoulder rotation in throwing or in serving in tennis, or repeated ankle flexion and extension in dance, diving, or gymnastics. NSAIDs have been particularly useful in the management of many of these overuse injuries. In patients with moderate to severe injuries, early constitution of drug therapy may aid in a more rapid and complete recovery. Furthermore, these drugs should be considered as adjuncts to the healing process and, therefore, it is important to use them in conjunction with other treatment modalities.

David England

* * *

"Comparison of Voluntary and Electrical Stimulation Contraction Torques," J. Kramer, et al., *Journal of Orthopedic and Sports Physical Therapy* 5: 324-331, 1984.

Thirty-two male volunteers having no known abnormal right knee or hip pathology served as subjects in this study which compared three different modes of electrical muscle stimulation in their ability to generate force. The current formations were asymmetrical biphasic rectangular, asymmetrical biphasic spike, and symmetrical monophasic square waves. The subjects were randomly assigned to only one current format and were tested under three isometric contraction conditions: electrical stimulation (ES), maximal voluntary contraction (MVC), and superimposed (ES and MVC simultaneously). Isometric knee extension torque for four successive efforts were analyzed. Under the voluntary and the superimposed contraction conditions no significant differences in mean torque were observed between the three current formats. Under the ES contraction condition the torque associated with the symmetrical monophasic square wave was significantly less than that associated with the other two current formats. In addition, the torque associated with the asymmetrical biphasic spike wave was significantly less than the torque associated with the asymmetrical biphasic rectangular wave format. No significant difference was observed between the maximum voluntary contraction (MVC) and the superimposed contraction conditions for the groups receiving the asymmetrical biphasic spike and the symmetrical monophasic square wave formats, or between all three contractions conditions for the group receiving the asymmetrical biphasic rectangular wave format. However, the ES condition was associated with significantly less torque than were the MVC and the superimposed conditions for the asymmetrical biphasic spike and the symmetrical monophasic square wave formats. It is suggested that electrical stimulation does not recruit more motor units than are recruited under maximal voluntary contractions in normal muscles.

Robert Tank

EDITOR'S NOTE: The following abstracts were presented at the 1984 NATA Annual Meeting as a part of the Free Communication Section sponsored by the Research and Injury Committee.

Continued on page 78

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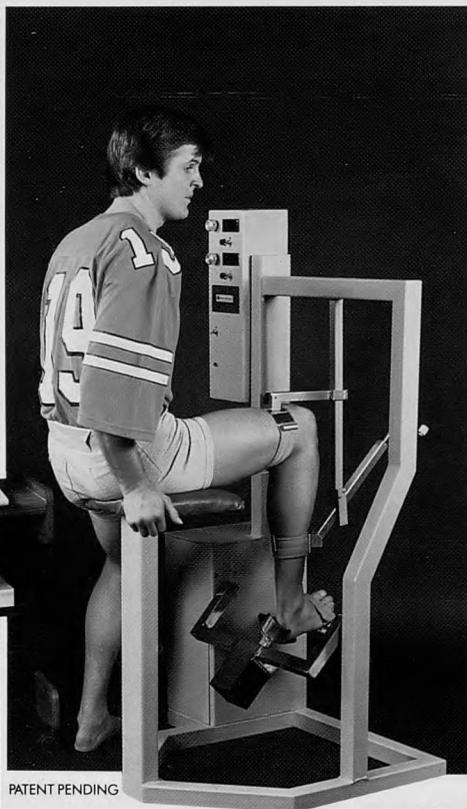
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ISODYNAMIC With the Isostation A-100, you can get 100% evaluation of the natural motion of the ankle and subtalar joints. It is the first and only isodynamic human performance testing tool that accommodates natural acceleration, constant speed and deceleration over the full range of the joints' movement—unlike other equipment which measures only isokinetic movement. And this is important because 82% to 84% of a given human motion consists of acceleration and deceleration, with only 16% to 18% being isokinetic.

JOINT SPECIFIC Isostations are joint specific, with the A-100 dedicated to the ankle/subtalar joints. It includes



**Only one
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machine
gives you
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isodynamic
completeness
and personal
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economy.**



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an easy-to-use positioning device which insures accurate measurement of the joint motion. Comfortable restraints control motion of adjacent body parts.



Use your IBM PC and true compatibles.

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Flexibility is another Isostation strong point. It can help you assess an ankle/subtalar injury or deficit as well as the effectiveness of rehabilitation programs. It can also be used to determine the performance profiles of specific pathologies.

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MONITORED Isostation A-100 is the only ankle/subtalar testing tool which interfaces with personal computers—the IBM PC and true compatibles as well as the Apple IIe. Its user friendly program provides graphs and reports, protocols along with data storage, retrieval and comparisons.

UNIQUE It's the unique new Isostation A-100. Bi-axial. Isodynamic. Personal computer monitored.

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Announcements

NATA Women's Athletic Training Conference

June 7, 1985 7:00-9:00 p.m. San Antonio, Texas

On behalf of the committee for the Women's Athletic Training Conference, we would like to extend a sincere thank-you to all of you who attended the 1984 Conference at the National Convention in Nashville. We were very pleased with the attendance (over 100) and hope everyone enjoyed hearing from Bobby Barton and Marge Albohm.

The meeting being on-site established credibility for the conference which will be continued on an annual basis at the National Convention. Each year an accomplished speaker will be a guest lecturer and speak on specific issues concerning female athletics and athletic training. The conference is open to all athletic trainers, male or female, who deal with the female athlete. The meeting allows people to gather and meet other athletic trainers across the country who are concerned about the health of the female athlete. It also establishes a support system within the female athletic medical health care system and recognizes the need for research in this area.

The 1985 Women's Athletic Training Conference will be on-site again at the National Convention in San Antonio, Texas, on June 7, 1985, from 7:00-9:00 p.m. Hope to see you there.

Trainers of the Year Announced by the Drackett Company

The following Athletic Trainers were honored by The Drackett Company at an Awards Dinner in Cincinnati in February:

Kent Falb, Professional Division
John Schrader, College Division
Leon Skeie, Junior College Division
Richard Carey, High School Division

The Drackett Company reminds us that it is not they who select the winners of their Annual Trainer of the Year campaign, but the membership of The National Athletic Trainers Association. This, in the opinion of The Drackett Company, makes the award one of the highest honors in the profession.

Congratulations Kent, John, Leon and Richard!

NATA Professional Education Committee Athletic Training Educators Workshop

Friday, June 7, 1985 San Antonio, Texas

NATA Professional Education Committee will conduct its annual Athletic Training Educators Workshop on Friday, June 7, 1985, in conjunction with the NATA Annual Meeting and Clinical Symposium in San Antonio. Tentative workshop topics include student evaluation in internship and curriculum settings, athletic training internship program guidelines, and a panel discussion designed to provide current information regarding NATA certification and approval of athletic training education programs. Topics should be of concern to directors of athletic training internship programs as well as approved curriculums. CEU credit will be awarded to workshop participants.

Workshop registration will be held at the door beginning at 12:00 on Friday, June 7th. The registration fee is \$10.00. For further information contact Pete Koehneke, Head Athletic Trainer, Canisius College, Buffalo, New York 14208. Telephone: (716) 883-7000. +

New Products



A Sponge Splint-Compression Dressing

Hydro-Splint™ is a new and innovative tool to those who evaluate, treat, and rehabilitate the common, but quite serious sprained ankle.

It immobilizes a suspected ankle fracture at the scene of the injury and during transportation to a medical facility. It is also quite valuable when transporting an injured athlete back home from an athletic event with a serious injury.

The Hydro-Splint Sponge Dressing is combined with a cold water immersion, elevation, and slow active exercise to reduce moderate to severe swelling in the moderate to severe sprained ankle. It provides a Tolerable Cold and Compression treatment, and can be used in warm water also.

For further information write to: Compression Splint Products, Inc. P.O. Box 7407, Pittsburgh, Pa. 15213. +

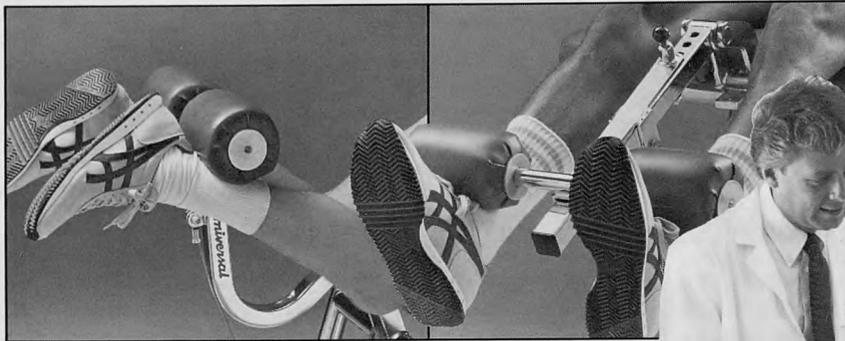
BOOK REVIEW from page 71

an interest in athletic training and sports medicine.

The book includes 51 detailed chapters covering such subjects as Pioneers in Sports Medicine, Anatomy and Diagnostic Signs, Taping and Bandaging, Protective Devices, Conditioning and Rehabilitation, Musculoskeletal System, and Special Medical Considerations, just to mention a few. A chapter of special interest is chapter 45 which deals with the physically impaired athlete. This chapter is of paramount interest due to the recent emphasis on participation of the handicapped. Chapter 47 is of excellent quality with its full color photographs of common dermatological problems.

I can not recommend this book highly enough. Only once in a long period of time are we offered a book of this quality at a reasonable price. +

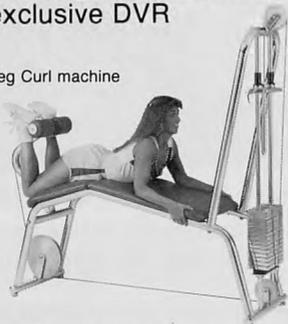
Biomechanically designed for the ultimate results in knee joint rehabilitation.



Introducing Universal Gym's
Leg Curl and Leg Extension
machines with DVR.

Physical therapists have long awaited machines that are properly designed biomechanically . . . and now they're here . . . the Universal Leg Curl and Leg Extension machines with Universal's

Leg Curl machine



exclusive DVR (Dynamic Variable Resistance) system.

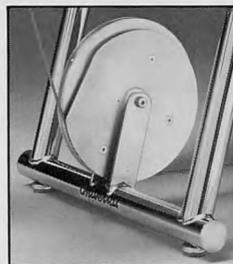
DVR automatically varies the machines' resistance during exercise, giving you maximum benefit from every lifting motion. The result is increased strength,

muscle endurance and flexibility. With DVR, the Leg Curl and Leg Extension machines provide maximum thigh and knee conditioning for rapid rehabilitation.

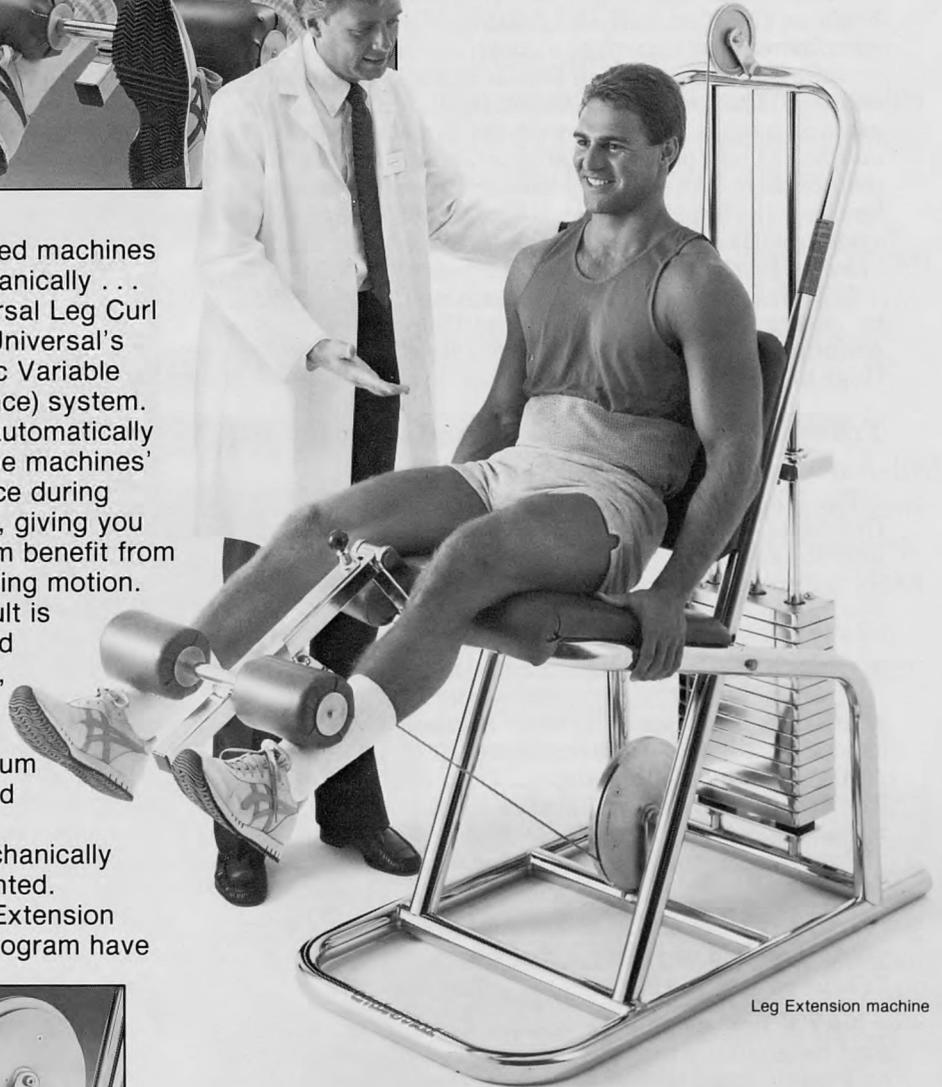
Scientifically designed . . . biomechanically engineered . . . sportsmedicine oriented.

The Universal Leg Curl and Leg Extension machines are what you and your program have been waiting for.

Two major machines . . . from the major name in physical conditioning equipment.



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Best times _____

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Cedar Rapids, Iowa U.S.A. 52406 **Phone toll free 800-553-7901**

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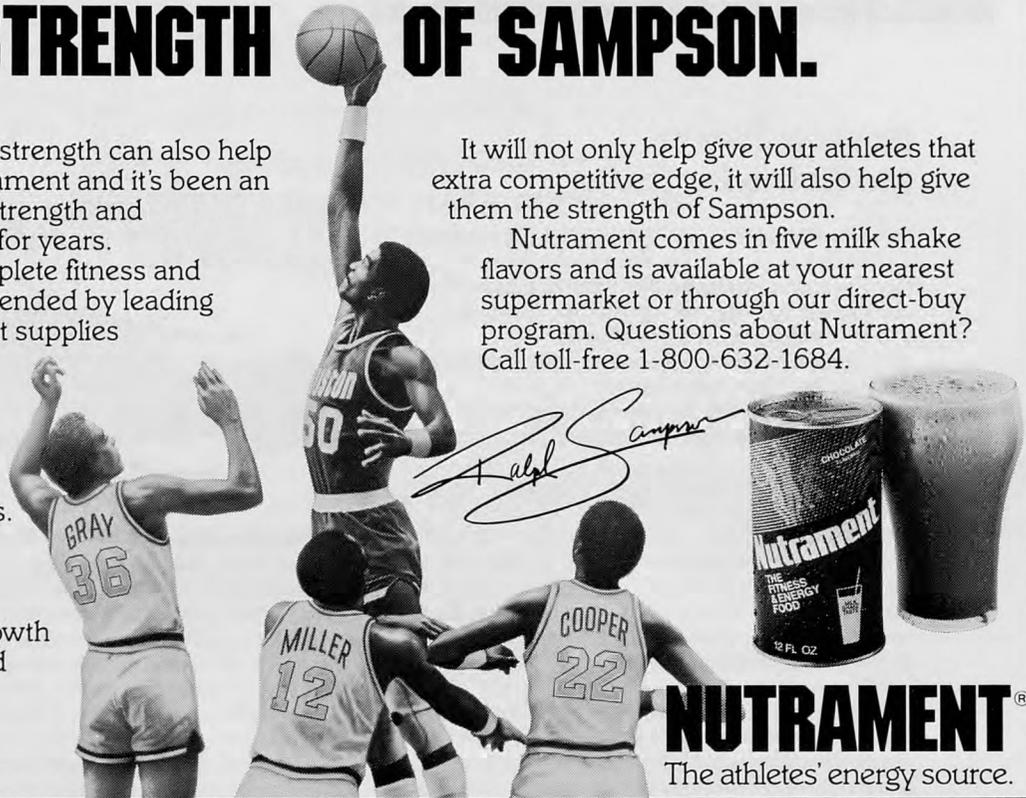
What helps give me strength can also help your athletes. It's Nutrament and it's been an important part of my strength and conditioning program for years.

Nutrament is a complete fitness and energy drink, recommended by leading coaches and trainers. It supplies carbohydrates to help build strength and endurance, or even increase weight during tough conditioning programs.

Nutrament also provides vitamins, minerals and protein needed for muscle growth and development. And because it's a liquid, it digests easily.

It will not only help give your athletes that extra competitive edge, it will also help give them the strength of Sampson.

Nutrament comes in five milk shake flavors and is available at your nearest supermarket or through our direct-buy program. Questions about Nutrament? Call toll-free 1-800-632-1684.



Book Reviews



Phil Callicutt, ATC, EdD
Federal Law Enforcement
Training Center
Glynco, Georgia 31524

The Knee

Philippe Segal, MD and Marcel Jacob, MD
Year Book Medical Publishers
35 East Wacker Drive, Chicago, IL 60601
1983
144 pp, illustrated
\$34.95

The Knee is a highly technical volume authorized by two leading sports medicine surgeons in France. Drs. Philippe Segal and Marcel Jacob were able to express highly complex and technical concepts clearly. The illustrations are of excellent quality and range from the

simple anatomy to the very complex biomechanical aspects of one of the most interesting joints of the body, the knee. It is an updating on all knee traumatology problems and will be of great value to orthopaedic surgeons and sports physical therapists. It will serve as a key reference for advanced graduate students in the study of the more complex biomechanical aspects of the knee.

There are six chapters contained in the text: An Introduction, Anatomy, Biomechanics and Kinetics, Diagnostic Signs and Symptoms, Pathology, and Diagnostic Notes.

Athletic Training and Sports Medicine

Members of American Academy of Orthopaedic Surgeons (AAOS) and Members of the National Athletic Trainers Association (NATA)
The American Academy of Orthopaedic Surgeons
PO Box 7195, Chicago, IL 60680
1984
602 pp, with over 450 illustrations
\$39.00 (hard cover)

Athletic Training and Sports Medicine is a joint effort of the American Academy of Orthopaedic Surgeons and the National Athletic Trainers Association. The joint authorship is extremely significant due to the fact that the membership of these professional organizations are charged with the management of sports related injuries, and have been the catalysts for the majority of the advances in the field over the past decade. I will state at the onset, this is a book for everyone, the student trainer, the "old brown shoe" trainer, the educator and team physicians. This book has something for everyone with

Continued on page 69

Boston Sports Medicine Institute

Join athletic trainers, coaches, educators, and professionals and students in the allied health fields from all over the country in Boston this June. All presentations and workshops have been updated for 1985 to provide you with the very latest information on:

- assessment, evaluation, diagnosis, and treatment of common sport and dance injuries
- rehabilitation concepts, team testing, and testing for back injuries using isokinetics (Cybex, Fitron, and ramping)
- development and implementation of proven strength and conditioning programs

The Boston Sports Medicine Institute is directed by Dr. Alfred Roncarati, RPT, ATC. Dr. Roncarati is Associate Professor of Physical Education at UMass/Boston and is a privately practicing physical therapist. He was formerly Head Trainer at Northeastern University.

Dr. Roncarati's associate is Joseph Donahue, Strength and Field Coach at Northeastern University. Mr. Donahue is a staff member of the U.S. Olympic Training Center and an Olympic development training consultant. He has coached fifteen NCAA Division I All-Americans, two national champions, and one Olympian.

The 1985 conference will introduce you to nationally recognized athletes, trainers, physical therapists, and physicians. The workshops in which they will participate, and their names and credentials, are as follows:

Sports Medicine/Athletic Training Workshop — June 24-27

- Kim Bissonnette, ATC, athletic trainer, Northeastern University
- James Bucciarelli, ATC, head trainer, Sports Medicine Center, St. Elizabeth's Hospital
- Dr. Diane English, orthopedic surgeon, St. Elizabeth's Hospital
- Dr. George McNanama, orthopedic surgeon, Milton Hospital
- Dr. Lyle Micheli, orthopedic surgeon, Sports Medicine Department, Children's Hospital, and orthopedic consultant to the Boston Ballet and the Boston Marathon
- Gayle E. Olson, ATC, head women's trainer, Wheaton College
- Nicholas Passaretti, RPT, ATC, physical therapist; formerly head trainer, Boston University
- Dr. Frank Santopietro, podiatrist, Sports Medicine Department, Children's Hospital
- Dr. William Southmayd, orthopedic surgeon, director, Sports Medicine Resource Center, and orthopedic consultant to the Boston Red Sox

Clinical Application of Isokinetics — June 28

- Paul S. Koval, registered physical therapist
- Dave Porrell, RPT, pre-season screening and evaluation consultant for the New England Patriots and Boston Bruins
- Dan Rook, instructor, Boston University Health Sciences Department, and researcher in exercise physiology and isokinetics
- Dave Smith, representative of Cybex Corporation

Sixth Annual Conference

June 24-29, 1985



Building Explosive Power for Sport — June 29

- Sandra Burke, field event coach, James Madison University, and national shot put champion
- Sam Colson, strength and conditioning coach, Clemson University; former 1976 Olympian, NCAA champion, and world ranked javelin thrower
- Dick Dow, assistant track coach, Holy Cross College, and field coordinator, New England Track and Field Camp
- Ernie Hackett, world powerlifting champion
- Bob Otrando, strength and field coach, Brown University, and eastern shot put champion

If you can attend only one training conference this year, make sure that this one is it! Certificates of achievement will be awarded, and Continuing Education Units and the opportunity to earn three undergraduate credits will be available. Mark your calendar for the sports medicine/athletic training clinic, isokinetic workshop, and strength workshop, or combine all three for six days of exciting and practical information.

Conference Fees:

Four-day Sports Medicine/Athletic Training Clinic — \$195

One day workshop "Clinical Application of Isokinetics" — \$60

One day workshop "Building Explosive Power for Sport" — \$60

Entire six day program — \$295

MasterCard and VISA are welcome.

For complete information on the Sixth Annual Conference, please call (617) 956-1000 or use this coupon:

Boston Sports Medicine Institute
University of Massachusetts at Boston
 Division of Continuing Education
 Downtown Center
 Boston, MA 02125-3393

Name _____

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Athletic Training Educators

Available for Purchase

**GUIDELINES FOR DEVELOPMENT AND
IMPLEMENTATION OF NATA APPROVED
GRADUATE ATHLETIC TRAINING EDUCATION PROGRAMS
1984 Edition**

Recently developed by the NATA Professional Education Committee and approved by the Board of Directors, these **Guidelines** govern NATA evaluation of graduate athletic training education programs. Directors of current NATA approved athletic training education program and college and university personnel contemplating development of new graduate programs will find these **Guidelines** essential to program development according to NATA standards.

Order Form

**GUIDELINES FOR DEVELOPMENT AND
IMPLEMENTATION OF NATA APPROVED
GRADUATE ATHLETIC TRAINING EDUCATION PROGRAMS
1984 Edition**

Please send me _____ copy(ies) of the **Guidelines** (\$10.00 each). Total amount enclosed \$ _____.

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PAYMENT MUST BE SUBMITTED WITH ORDER! Make checks payable to NATA **Professional Education Committee** and mail to:

Dr. Gary Delforge
NATA Professional Education Committee
Department of Physical Education
University of Arizona
Tucson, Arizona 85721

Question-Answer

Q. What should one do to save a dislodged tooth?

A. If the patient remains calm, follows some simple advice and gets to a dentist immediately, preferably within 20 to 30 minutes, the tooth can be replanted. With proper treatment the tooth will reattach itself and could last several years.

The following advice is given for saving a tooth:

1. Stay calm and locate the tooth. If it is still in the mouth, gently push it back into the socket.
2. If the tooth is on the ground, pick it up by the crown, **NOT** the root.
3. Place the tooth in the socket or in the mouth between the cheek and gum. If the victim is a very young child and will not take the tooth, a parent or other adult can hold the tooth in his or her own mouth. The most important thing is to keep the tooth moist during the period before treatment.
4. Do **NOT** put the tooth in tap water, mouth wash or alcohol. These substances will damage cells of the tooth. Do not attempt to scrub the tooth or clean it with abrasives or chemicals.
5. See a dentist immediately. Call your dentist, even if the accident occurs in the middle of the night. If he or she is unavailable, call a hospital emergency room. There may be a dentist on call. If your own dentist is unavailable, and the emergency room cannot help, look in the phone book for a dental society referral service or the name of

an endodontist. Endodontists are dentists who specialize in root canal therapy and have special training in treating traumatic injuries and emergencies.

The dentist will replant the tooth in the socket after proper cleansing. Several follow-up visits may be necessary. Root canal therapy may be needed to remove the inner tissues of the tooth that may have been damaged by the injury. On very young teeth, root canal therapy may not be needed. If the tooth is replanted within 20 minutes, or at least in the mouth until treatment, the prognosis is very good. The majority of replanted teeth can last for many years.

After root canal therapy, the tooth may need an artificial crown because the tooth can become discolored or may not be quite as strong as it was before the injury.

Children who are involved in sports such as football or hockey should be fitted for a protective mouthpiece that helps prevent mouth and tooth injuries.

Dr. Jens O. Andreasen
 Dr. Frances Andreasen
 Department of Oral Medicine
 and Oral Surgery
 Rigs Hospital
 Copenhagen, Denmark +

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The **EGS** systems offers you the professional the versatility you need to meet the broadest range of patient care. The **EGS 100-2** is a clinical unit with a new face and new features, designed to identify and target treatment of specific areas through the use of interchangeable electrodes. With the



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Isoscan improves your Cybex or Orthotron by adding the speed and accuracy of a personal computer

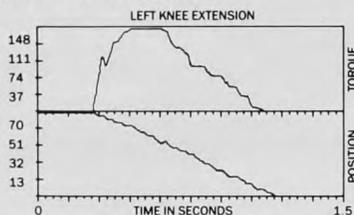
How does Isoscan do this? By joining forces with a computer to upgrade your Orthotron or Cybex as a diagnostic tool for human performance testing and research. Use it for pre-season

and task screening, clinical testing and evaluation, even for reports submissible to physicians and insurance companies.

COMPREHENSIVE ANALYSIS. You can count on Isoscan's Comprehensive Analysis for complete data evaluation. Data collection includes biographical information as well as user-definable parameters for test duration, movement task and direction, body segment and speed setting. Your Analysis will include graph data; print data displaying positions, torques and times; along with a summary table print out. You will also be able to store and retrieve data and compare any two performances with the trial comparison feature.

REPETITIONS AND MAXIMUM TORQUE. Isoscan's Repetitions routine

Isoscan's comprehensive analysis includes graphs, summary reports and comparisons



NAME: JOHN STEVENS TEST DATE: 10/16/83
 WEIGHT: 173 INJURY DATE: 10/1/83
 HEIGHT: 72 SURGERY DATE:
 MOVEMENT: LEFT KNEE EXTENSION
 LEVER ARM: 1.2
 MAXIMUM TORQUE = 185.43 LBS-FT
 AVERAGE TORQUE = 117 LBS-FT
 MAX TORQUE/BODY WT = 1.07
 POSITION OF MAX TORQUE = 74.98 DEGREES
 RANGE OF MOTION = 97.5 DEGREES
 MAXIMUM FORCE = 154.52 LBS
 AVERAGE FORCE = 97.5 LBS
 ANGULAR WORK = 237.27 FT-LBS
 ANGULAR IMPULSE = 92.6 LBS-FT-SEC

collects data for any number of repetitive movements. It is used as a first step in testing. When abnormalities appear, you'll move on to Comprehensive Analysis.

With our Maximum Torque routine, you can investigate your patients' motivation as well as past performance. Real-time feedback and patient incentive are provided.

NO LOST FILES. Isoscan stores your files on a 5¼ inch floppy disk. To retrieve information, you just need to know the file number. A *Directory* is automatically created and updated as you add files through the Comprehensive Analysis and Repetitions routines.

MONEY SAVER. As you see on the accompanying graph, the cost of a retrofitted Orthotron—including the cost of a computer—is about half that of a Cybex system. Independent research indicates that with this combination you'll be able to gather data comparable to that from a Cybex.

If you have a Cybex, you can use Isoscan to expand it tremendously as a measurement tool. No other software program offers you more for the money than Isoscan.

Isoscan is designed to run on the Apple IIe, IBM PC and several other leading personal computers. Besides expanding your Orthotron or Cybex, these computers let you add time saving software for word processing, financial management, inventory control and many other functions.

Another money-saving plus: an experienced Cybex or Orthotron user—with no computer knowledge—can learn Isoscan in just a few hours.

GUARANTEED ACCURACY. With Isoscan's System Utilities Functions you can count on guaranteed

accuracy of measurement values. *Speed Setting* allows you to establish degrees per second with the Orthotron for reliable and valid data. *Calibration* means your computer can calculate accurate position and torque values on your Cybex or Orthotron. And the *Diagnostics* function tells you if recalibration is necessary.

SUPER SUPPORT. You'll be glad to know, too, that you can count on the specialists at Isotechnologies, the developers of Isoscan, for dependable, ongoing support. We'll assist you with installation, any technical difficulties and everyday use. Periodic updates to the Isoscan program will be available to you at no cost.

PLUS. Isoscan is not the only Isotechnologies product you should know about.

Our Injury Records Program (IRP) combines four user-friendly programs to help you keep records of injuries and to produce accurate, useful reports within minutes.

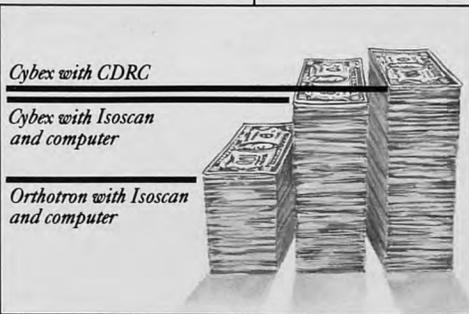
Isotechnologies is also introducing computer-monitored Isostations. Setting

new standards in performance measurement for the back, shoulder, ankle, knee and neck, Iso-stations are the first machines that accommodate human motion naturally in three dimensions.

This is only an overview of all we can do for you—for less. Call us for complete information.



Isoscan runs on the IBM PC, the Apple IIe and other personal computers



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Guide to Contributors

Athletic Training, The Journal of the National Athletic Trainers Association, Inc. welcomes the submission of manuscripts which may be of interest to persons engaged in or concerned with the progress of the athletic training profession.

The following recommendations are offered to those submitting MANUSCRIPTS:

- Four copies of the manuscript should be forwarded to the editor and each page typewritten on one side of 8½ x 11 inch plain paper, triple spaced with one inch margins.
- 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; however photographs cannot be returned if the manuscript is published.

All artwork to be reproduced should be submitted as black and white line art (either drawn with a Rapidograph [technical fountain pen] or a velox stat or PMT process) with NO tonal values, shading, washes, Zip-a-tone — type screen effects, etc. used.

All artwork to be reproduced in black plus a second (or more colors) should be submitted as black and white line art (see above paragraph), with an Amberlith® or similar-type overlay employed for each area of additional color(s). Also, all areas of tonal value, shading, "washes", etc. should be supplied on a separate clear or frosted acetate or Amberlith® overlay. In addition, all areas to be screened (a percent or tint of black or color) should be supplied on an Amberlith® overlay. Artwork cannot be returned if the manuscript is published.

- The list of references and citations should be in the following form: a) books: author, title, publisher with city and state of publication, year; b) articles: family names, initials and titles of all authors, title of article, journal title, with abbreviations accepted as per Index Medicus, volume, page, year. Citations in the text of the manuscript will take the form of a number in parentheses, (7), directly after the reference or name of author being cited, indicating the number assigned to the citation. Example of references to a journal, book, chapter in an edited book, and presentation at a meeting are illustrated below. Reference page accompanying manuscript should list authors in alphabetical order numerically.
 - Knight K: Preparation of manuscripts for publication. *Athletic Training* 11 (3):127-129, 1976.
 - Klafs CE, Arnheim DD: *Modern Principles of Athletic Training*. 4th edition. St. Louis, CV Mosby Co. 1977 p. 61.
 - 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.

- Behnke R: Licensure for athletic trainers: problems and solutions. Presented at the 29th Annual Meeting and Clinical Symposium of the National Athletic Trainers Association. Las Vegas, Nev, June 15, 1978.
- In view of *The Copyright Revision Act of 1976*, effective January 1, 1978, all transmittal letters to the editor must contain the following language before manuscripts can be reviewed for possible publication: "In consideration of the NATA taking action in reviewing and editing my submission, the author(s) undersigned hereby transfers, assigns or otherwise conveys all copyright ownership to the NATA, in the event that such work is published by the NATA." We regret that transmittal letters not containing the foregoing language signed by all authors of the manuscript will necessitate return of the manuscript. Manuscripts are accepted for publication with the understanding that they are original and have been submitted solely to *Athletic Training*. Materials taken from other sources, including text, illustrations, or tables, must be accompanied by a written statement from both the author and publisher giving *Athletic Training* permission to reproduce the material. Photographs must be accompanied by a signed photograph release form.

Accepted manuscripts become the property of the Journal. For permission to reproduce an article published in *Athletic Training*, send request to the Editor-in-Chief.

- Manuscripts are reviewed and edited to improve the effectiveness of communication between the author and the readers and to assist the author in a presentation compatible with the accepted style of *Athletic Training*. The initial review process takes from six to eight weeks. The time required to process a manuscript through all phases of review, revision, and editing, to final publication is usually six to eight months depending on the timeliness of the subject. The author accepts responsibility for any major corrections of the manuscript as suggested by the editor.
- It is requested that submitting authors include a comprehensive abstract, a brief biographical sketch and acceptable black and white glossy photograph of themselves. **Please refrain from putting paper clips on any photograph.**
- Published manuscripts and accompanying artwork cannot be returned. Unused manuscripts will be returned when submitted with a stamped, self-addressed envelope.

Address all manuscripts to:
 Clint Thompson
 Jenison Gym
 Michigan State University
 East Lansing, Michigan 48824

The following recommendations are offered to those submitting CASE HISTORIES:

- The above recommendations for submitting manuscripts apply to case studies as well but only two copies of the report need be sent to the Editor-in-Chief.
- All titles should be brief within descriptive limits. The name of the disability treated should be included in the title if it is the relevant 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 first or third person pronouns.
- An outline of the report should include the following components:
 - Personal data (age, sex, race, marital status, and occupation when relevant)
 - Chief complaint
 - History of present complaint (including symptoms)
 - Results of physical examination (Example: "Physical findings relevant to the physical therapy program were...")
 - Medical history — surgery, laboratory, exam, etc.
 - Diagnosis
 - Treatment and clinical course (rehabilitation until and after return to competition) use charts, graphs when possible
 - Criteria for return to competition
 - Deviation from the expected
 - Results — days missed
- Release Form**
 It is mandatory that *Athletic Training* receive, 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.

The following recommendations are offered to those submitting material to be considered for TIPS FROM THE FIELD:

- The above recommendations for submitting manuscripts apply to Tips From the Field but only two copies of the paper need be submitted.
- Copy should be typewritten, brief, concise, in the first or third person, and using high quality illustrations and/or black and white glossy prints.

The following guidelines must be met for submission of papers or material to the "STUDENT TRAINER CORNER."

- Author must be an undergraduate student member of NATA.
- Topics must relate to athletic training. (case reports, experimental reports, suggestions, new ideas, tips and/or specifics for a given problem)
- Articles should be no more than 2 to 3 pages in length, double spaced.

Journal Deadlines

In order to avoid confusion and delays on contributions to the Journal the deadlines for various sections are provided below.

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

The deadlines are:

Journal	Deadline
Spring Issue	December 15
Summer Issue	March 1
Fall Issue	June 15
Winter Issue	September 15

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

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ABSTRACTS from page 67

A Rehabilitation Program Following Fasciotomy for Chronic Compartment Syndrome

A rehabilitation program following fasciotomy for chronic compartment syndrome was evaluated after 17 months. Thirty-four patients with 70 symptomatic and functionally disabling compartments were treated during this period. The protocol involved passive stretching, whirlpool, and heat/cold concepts to maintain flexibility, reduce pain and prevent scarring. Mean pre-operative resting compartment pressures were 27.3 mm. hg. (53 compartments). Postoperative results were gratifying with 28 patients (82%) reporting total cure. Followup averaged nearly five months and was complete. Thirty-three patients experienced relief of tightness in the involved compartment(s). Adverse outcomes included one compartment recurrence, three muscle injuries with delayed recovery, one mild neuropraxia, and one painful scar. Return to walking averaged five days and return to running averaged 23 days. Twenty-six patients followed the protocol. The initial protocol was seen as too aggressive for many. A revised protocol has been developed which will help clinicians assist these patients to return to full activity.

B. J. Sherman
M. C. Detmer
D. E. Detmer
K. R. Sharpe
W. G. Clancy

* * *

The Use of External Compression to Limit and Disperse the Accumulation of Edema Associated With Ankle Sprains

One of the most common of all injuries in athletics is the inversion ankle sprain. Aggressive early treatment to control edema is critical to permit the earliest possible return to activity with the least amount of disability. Uncontrolled edema delays recovery and may: 1) prevent healing by first intention, 2) increase secondary hypoxic tissue death, 3) initiate the pain-spasm-pain cycle, 4) prevent active use of the joint, and 5) cause the development of an insoluble necrotic wall around the injury site. Poorly managed edema may ultimately

result in range-of-motion restrictions, joint laxity, and muscular atrophy, all of which predispose the athlete to reinjury.

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Gary B. Wilkerson

* * *

Effects of Full Hip-Flexion and 45-Degree Straight Leg Raising Exercises on Retropatellar Pain. Thesis. M. A. in Physical Education, 1983.

The purpose of this investigation was to determine if there were any real differences among the full hip-flexion, 45-degree straight leg raising treatment groups and the control group relative to retropatellar pain management based upon selected Cybex II and physical tests and measurements of the quadriceps and hamstring muscle groups. Ten female intercollegiate athletes each with a history of retropatellar pain were subjects in the pretest, post-test control and treatment research-design project. Data were collected on the following variables: strength — percent extension, percent flexion, left and right flexion/extension ratio; torque — percent involved/uninvolved knee, left and right torque 15-degrees; power — percent extension, percent flexion; power endurance — percent extension, percent flexion; hamstring flexibility; Q-angles and watts of work on treadmill. Analysis of variance were run on the changes from pre to post-test results on each variable for each treatment group. The null hypothesis were all accepted at the .05 level of confidence. None of the treatments produced any significant changes of any of the tested variables.

Debra Rae Wilkins +



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want the tooth extracted and immediately replaced with a prosthetic device. Despite the advances in dentures, nothing works quite as well as a natural tooth, and many teeth, even those that are broken down to the root, can be repaired through root canal therapy and modern restorative materials and techniques.

When a tooth is fractured at the root it may seem logical and simple to extract what's left and replace it with a bridge. But victims of chipped, cracked and broken teeth should resist the temptation to replace their own teeth with prosthetic ones, even if those teeth are severely damaged, said Dr. Paul Radman, a Dallas endodontist and general chairman of the International Conference on Oral Trauma. "Today, more than ever, damaged teeth can be repaired with modern materials and techniques, such as bonding, porcelain jacket crowns, orthodontic and endodontic procedures," Dr. Radman said.

For example, teeth that sustain traumatic injuries often need root canal therapy because the injury damages

the pulp, or inner tissue of the tooth. Endodontic therapy removes the damaged pulp and replaces it with a filling material, which allows the retention of the tooth in a healthy functioning state for many years. Without this procedure, the tooth would have to be extracted, Dr. Radman said. There are many reasons for making the effort to save a natural tooth, according to Dr. Radman. They include:

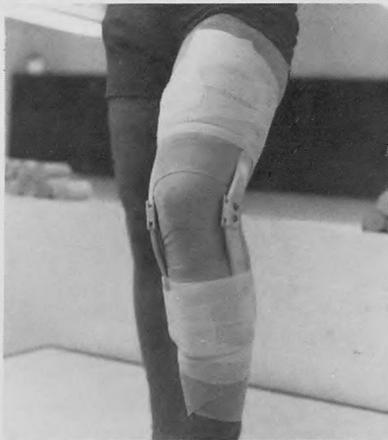
- A natural tooth provides stimulation to the gum and bone tissues, preventing the shrinking of the jaw and helping prevent periodontal or gum disease.
- The insertion of a bridge or other prosthetic device may require the cutting of adjacent healthy teeth.
- Teeth are used as anchors for bridges when a tooth cannot be saved. It is important to keep as many teeth as possible so they will be available as anchors.
- Natural teeth, even those that have been severely damaged, function more effectively than prosthetic ones.
- If a tooth is extracted and not replaced with a bridge, other teeth can shift, affecting biting and chewing efficiency and often leading to gum disease.

Continued on page 84

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*Journal of Orthotics & Prosthetics, March 1984.

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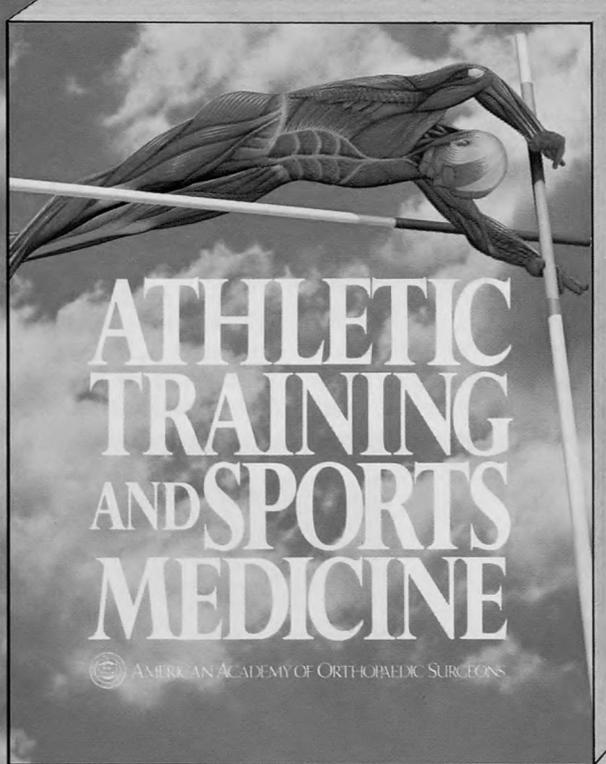
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POTPOURRI from page 63

cause a greater risk of stillbirth, and maternal and infant bleeding."

Regarding adverse effects on the stomach, Dr. Irwin believes aspirin's hazards are overemphasized. "It takes a large amount - 15 or 20 tablets per week - to show signs of ulceration," he said. In fact, only five percent of aspirin users will experience stomach irritation.

"Taking aspirin near the end of a meal or drinking a full glass of water with aspirin will lessen the likelihood of stomach irritation when the drug is only needed occasionally," Dr. Irwin noted.

Vitamin E

January, 1984 Contemporary Nutrition

After fifty years of research on the role of vitamin E in health and disease, we know that patients with genetic diseases or congenital defects which cause malabsorption can develop vitamin E deficiency with associated symptoms. These are the only medical conditions where there is a consensus that vitamin E has a proven therapeutic role.

Many other clinical problems for which the vitamin is sometimes prescribed need further study to provide more convincing evidence of efficacy. Healthy persons receive an adequate intake of vitamin E in a balanced diet that meets other nutritional needs. Use of supplementary vitamin E by such individuals has not been shown to confer any additional health or fitness benefits.

Women Should Serve Up More Vitamin B-2

News Release National Dairy Council

Women who are trying to subtract inches from their waistlines should add more riboflavin-rich foods to their

diets. According to a new study, active women may need twice as much of this B-vitamin than is currently recommended.

Daphne A. Roe, MD, at Cornell University points out that cells require riboflavin, also called vitamin B-2, to burn calories efficiently. Jogging, aerobic dancing, swimming — no matter what the exercise, if a woman does it daily or almost daily, she needs more of this vitamin.

"Exercise is the major factor that influences a woman's riboflavin needs," Roe explained. In her research conducted at Cornell University and published in the American Journal of Clinical Nutrition, Roe demonstrated the link between exercise and the body's need for riboflavin.

The 12-week long study involved a dozen healthy women ages 19 to 27. For the first six weeks, the women jogged for 20 to 50 minutes daily. All participants ate diets containing the same amount of riboflavin. Through diet control and blood tests, Roe was able to tabulate the women's riboflavin status at regular intervals.

"What the study told us is that healthy young women need more riboflavin even if they don't exercise," Roe said. "And women of all ages in our studies who did exercise regularly needed as much as double the amount of riboflavin than is now recommended."

Roe's study suggests that the Recommended Dietary Allowance (RDA) for riboflavin may simply be too low. The RDA now calls for 0.6 mg of vitamin B-2 for every 1,000 calories of food consumed. This adds up to about 1.2 mg a day for women.

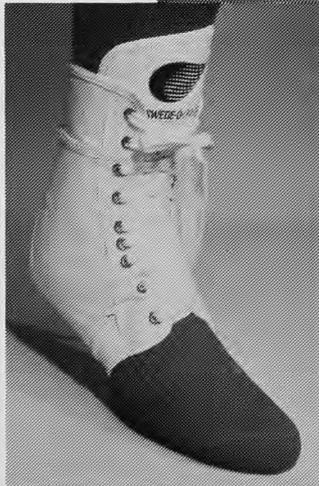
Dairy foods are one of the best sources of riboflavin. An 8-ounce serving of milk provides about one-third of the adult RDA for this nutrient. Other foods that contain riboflavin are liver, green, leafy vegetables and fortified breakfast cereals. +

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Dentists Need Psychological Skills in Treating Children with Traumatic Injuries

The playground roughhousing comes to an abrupt halt as 6-year-old Tommy, with the help of a friendly shove from a pal, crashes headlong onto the concrete sidewalk. When he pulls himself to his knees, his nose and lip are bleeding, his two bottom teeth are chipped and his two new top front teeth are clutched in his hand.

Tommy is terrified. His parents were so proud of his straight teeth and he knows they will be upset that the teeth were knocked out; they had warned him repeatedly about playing so rough. He wonders about the treatment he will need. Will it hurt? And what about the future? Will he have to go through life with a gaping hole where his front teeth used to be?

Pedodontist Dr. Stephen Moss of New York University College of Dentistry discussed the treatment of traumatized children at the International Conference on Oral Trauma. Dr. Moss has been treating children for 24 years and has contributed extensively to public education on children's dentistry. In his lecture, he stressed that the emotions of children must be treated along with their physical injuries. "The quality of the care that the child gets is directly related to the ability of the dentist to manage the child's behavior," Dr. Moss said. "The dentist has to be well versed in the psychodynamics of the child's feelings and emotions and the situation leading to the injury."

Children's fears and emotions are often the same ones adults suffer, but because children are less able to verbalize those fears, they express them in their behavior

and body movements. Dentists must be able to interpret a child's behavior and bring it under control, as well as control their own behavior in a way that reassures the young patient.

When a child is in the dentist's chair because of abuse inflicted by his or her parents, the emotional trauma may be even more severe than it would be following a playground accident. The dentist then has to deal with the parents as well as the traumatized child.

Dr. Moss pointed out several techniques dentists may use to calm children's anxieties. Adapted from the work of child psychologist Haim Ginott, they include:

- Giving the child a time frame: Young children want to know when something is going to end, such as a long car ride. Letting children know how long a procedure will take and that it will end, helps calm them.
- Complimenting the child's behavior: Young children feel a strong need to please and are reassured by knowing that their good behavior is appreciated.
- Giving the child choices: Children who have been injured feel they have lost control. Giving them choices ("Shall we fix the top tooth first or the bottom one?") helps give them a sense of control.

Tommy will suffer no permanent scars from his accident. Taken to the dentist quickly, his two front teeth were replanted. He was later treated by an endodontist, a specialist in root canal therapy. Root canal therapy was needed to restore the damaged inner tissues of his teeth. The rescued teeth may last the rest of Tommy's life. His chipped teeth were repaired with the latest restorative techniques and materials.

(EDITOR'S NOTE: See related Question & Answer on page 74.)

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STUDENT TRAINER CORNER *from page 65*

training, a further understanding of ultrasound is needed. Hopefully, this paper will help in this understanding. Further research is needed and documentation of treatments are essential to make ultrasound less mysterious. Ultrasound can be destructive, but if used correctly, ultrasound can be the most helpful modality in the training room.

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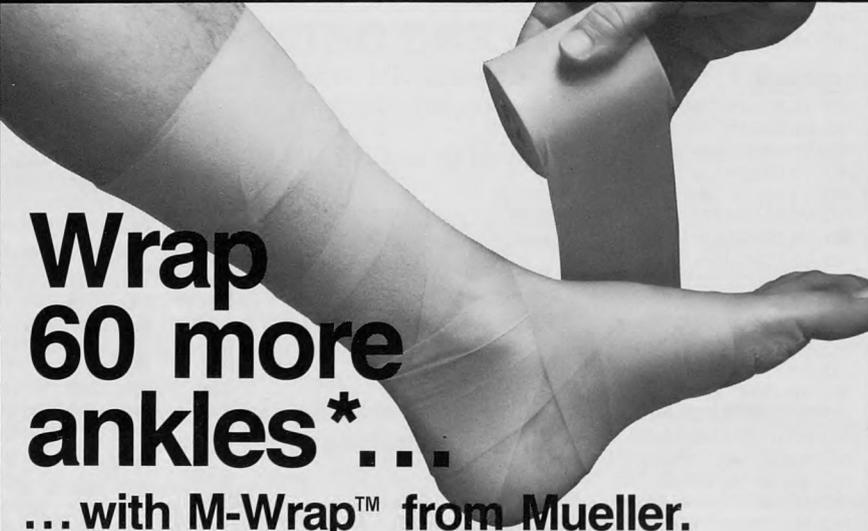
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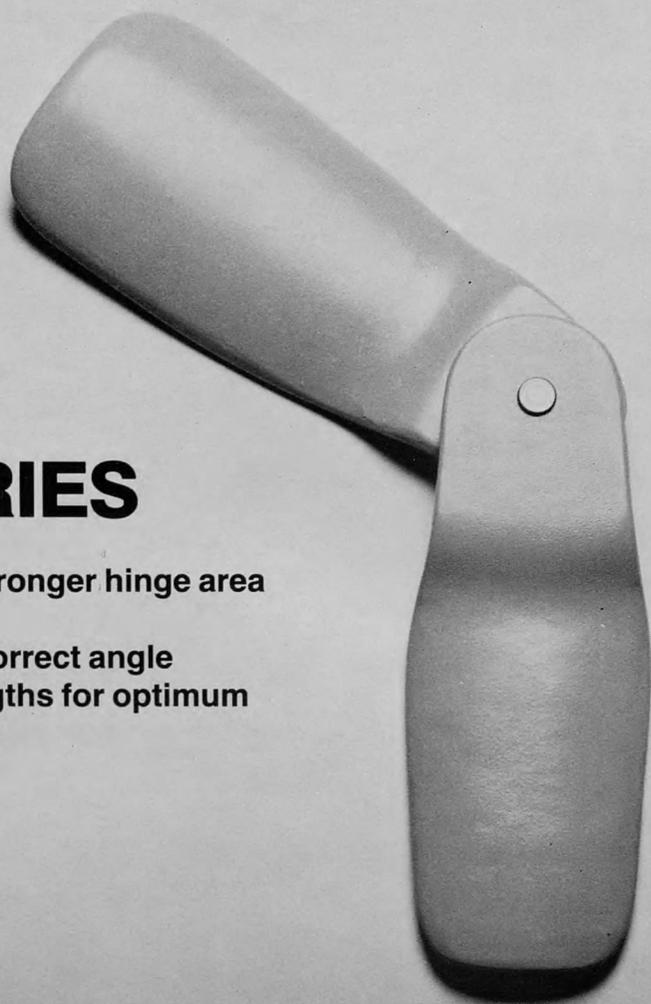
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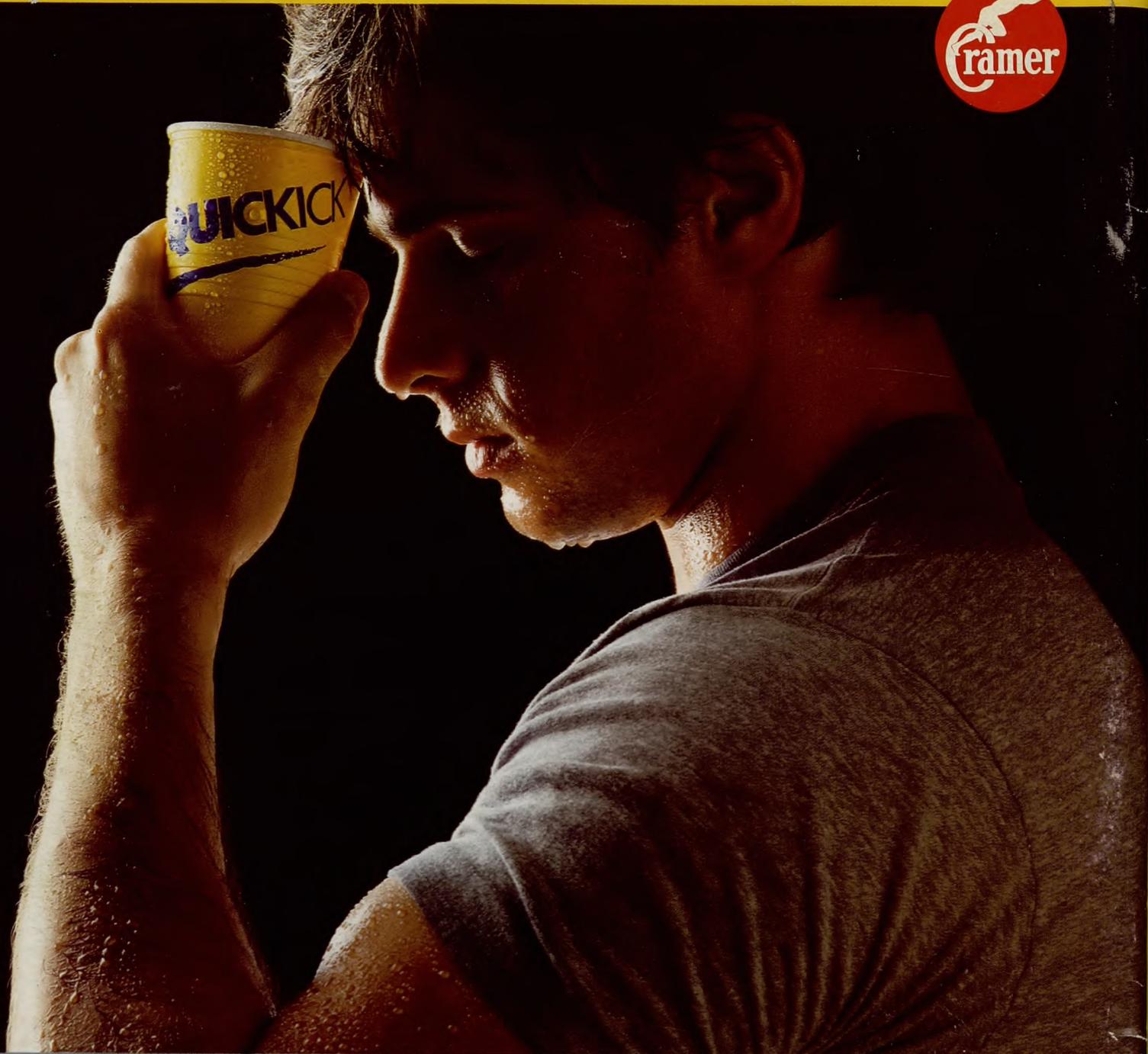


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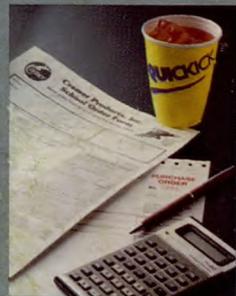
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