ATHLETIC TRAINING

THE JOURNAL OF THE NATIONAL ATHLETIC TRAINERS ASSOCIATION

IN THIS ISSUE:

Volume 10
Number 2
June 1975

Commemorative Edition Tankards

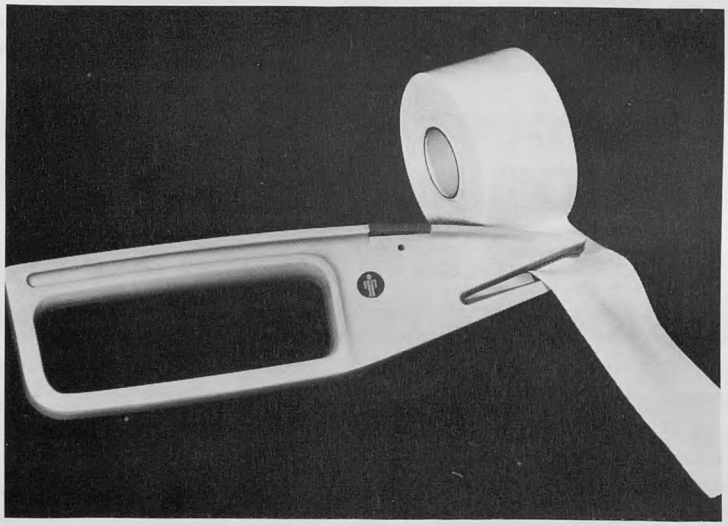
Now, for a limited time only, we offer this special edition tankard commemorating the 25th anniversary of the National Athletic Trainers Association.

Crafted from fine silver alloy, this sturdy tankard boasts a large 16 ounce capacity, and is sure to become a cherished keepsake of all NATA members.

To order, send $12.00, (price includes postage and handling), to:

TANKARDS
3315 South Street
Lafayette, Indiana 47904

The Shark™:
PPI™ will match it against any other tape and bandage cutter on the market for speed and safety.



Ever wish that someone would come up with a tape and bandage cutter that really worked – one that could cut through several layers of tape and not need the blade changed after one use? We've got it – The SHARK.

In field testing, trainers and athletes told us that the new SHARK Tape and Bandage Cutter is faster, easier to handle and more comfortable than anything they've used before.

The longer-life-surgical carbon steel blade is so effective and sharp, it will quickly cut as many as 10 layers of elastic tape. Yet it is extremely safe with an easy-to-replace, one-piece blade cartridge that snaps in place in seconds without screws or hooks.

The SHARK is one of the latest additions to the Protective Products (PPI) complete line of training supplies, which includes ACE® brand bandages, aerosols, liniments, vitamins, and other products to fulfill your training room needs. All are backed by the extensive testing facilities of the PPI parent company, Becton, Dickinson and Company, a leader in health care products since 1897.

For our new catalog outlining our complete line which also includes helmets, shoulder pads and body pads, write Protective Products, P.O. Box 291, 1913 E. Pine, Grand Prairie, Texas 75050.

PROTECTIVE PRODUCTS
Division of Becton, Dickinson and Company
Post Office Box 291
1913 E. Pine
Grand Prairie, Texas 75050
(214) 264-9311

"Some of our key players would have seen a lot less game time if not for the excellent results we're getting with these systems."

"CYBEX and ORTHOTRON measure and rehabilitate not only strength, but power and endurance, too. This is extremely important for evaluating injuries and insuring complete rehabilitation."

"We've seen athletes in seemingly good condition with right to left side or agonist/antagonist imbalances, or a poor power to strength relationship. I think that quantifying and correcting these deficits not only reduces the chance of injury, but actually improves the athlete's performance."

"The entire system is surprisingly easy to use . . . testing methods are quickly learned and results are easily interpreted so that specific rehabilitation exercise and training programs can be tailored to the needs of the individual athlete."

"A CYBEX could pay for itself in shoulder, elbow and wrist rehabilitation alone."

"The players have real confidence in the CYBEX and ORTHOTRON. They believe in results and are as interested in the chart recordings of their progress or performance as the team physician and I. They really want to use this equipment for strength maintenance and training programs."

"We have dramatically reduced our number of knee injuries . . ."

"One of the most eye-opening features of these systems is their ability to test and exercise at high contractile/velocities. Adequate or equal slow-speed strength, like developed with weights, is no guarantee of high velocity, power or endurance."

"After more than a year's experience with CYBEX and ORTHOTRON, we're convinced that we are getting much faster rehab results, reducing the number of re-injuries, and, in some cases, actually improving player performance and preventing injuries from occurring."

Otho Davis in the Philadelphia Eagle's training room

"The cost of CYBEX and ORTHOTRON is a small investment to protect any team's largest investment – talented athletes."

These are some of the teams that have purchased CYBEX II and/or ORTHOTRON in the past year:

Boston Celtics Basketball Club, Boston Red Sox Baseball Club, Cleveland Browns Football Club, Denver Broncos Football Club, Houston Texans Football Club, Indiana Pacers Basketball Club, Minnesota Twins Baseball Club, Minnesota Vikings Football Club, New England Whalers Hockey Club, New York Jets Football Club, New York Stars Football Club, Philadelphia Phillies Baseball Club, Phoenix Suns Basketball Club, San Diego Chargers Football Club, San Francisco 49ers Football Club, Clemson University, University of Illinois, Michigan State University, Michigan Tech. University, NASA (Skylab Team), University of North Carolina, University of Notre Dame, University of Oklahoma, San Diego State College, University of Southern California, University of Texas, Texas Tech. University, U.S. Air Force Academy, U.S. Army Academy, U.S. Naval Academy, Univ. of Western Ontario, Williams Col.

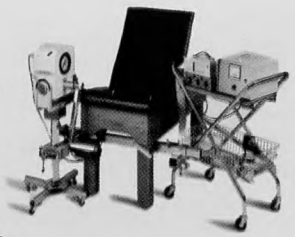
LUMEX INC.
CYBEX DIVISION

Lumex, Inc. — Sports Medicine Dept. — 100 Spence Street — Bay Shore, N.Y. 11706 — (516) 273-2200

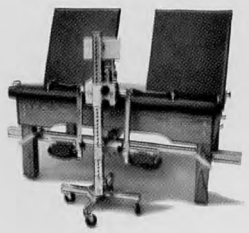
MAIL TO: LUMEX, INC./100 SPENCE ST., BAY SHORE, N.Y. 11706

Please send more information on:
☐ All systems.
☐ CYBEX
☐ ORTHOTRON
☐ FITRON

Name
Team or Affiliation
Address
City
State
Zip
Phone



CYBEX II–Now available in special set-up providing the convenience and versatility needed for Sports Medicine and Research applications.



ORTHOTRON–Lower-cost reciprocal Isokinetic exerciser available with S-H-D Tables to suit any training or rehab area's needs.

FITRON–The first and only Cycle-Ergometer designed specifically for the athlete in training . . . much higher work-rates, much stronger frame, higher positive adjustments.

ATHLETIC TRAINING

The Journal of the National Athletic Trainers Association

Volume 10 Number 2 June 1975

CONTENTS

ARTICLES

DEPARTMENTS

Athletic Training is published in the months of March, June, September, and December by the National Athletic Trainers Association, a non-profit organization. Second class postage paid at Lafayette, Indiana 47904, and additional mailing offices. Address correction requested: Send From 3579 to 3315 South Street, Lafayette, Indiana 47904.

The views and opinions expressed in **Athletic Training** are those of the author and not necessarily those of the National Athletic Trainers Association.

Non-member subscriptions are available at $7.00 per year and may be obtained by writing to 3315 South Street, Lafayette, Indiana 47904.

CHANGE OF ADDRESS may be made by sending old address and new address with zip code number. Instructions should state whether change is temporary or permanent. Allow thirty days for changeover. Address changes should be sent to 3315 South Street, Lafayette, Indiana 47904.

ADVERTISING—Although advertising is screened, acceptance of the advertisement does not necessarily imply NATA endorsement of the product or the views expressed. Advertising rates available on request, Eastern Associates, P.O. Box 2928, Greenville, North Carolina 27834 (telephone: 919/758-2486).

Printed by National Printing Company / Greenville, North Carolina

The National Athletic Trainers Association

President
Frank George
Brown University
Dept. of Athletics
Providence, Rhode Island 02912

Executive Director
Otho Davis
Philadelphia Eagles
Veterans Stadium
Philadelphia, Pennsylvania 19148

Board of Directors

Dist. 1 Wesley D. Jordan
University of Maine
Orono, Maine 04473

Dist. 2 Francis J. Sheridan
Lafayette College
Easton, Pa. 18042

Dist. 3 Craig Lewellyn
West Virginia University
Morgantown, W. Va. 26505

Dist. 4 Robert C. White
Wayne State University
Detroit, Michigan 48202

Dist. 5 William W. Flentje
University of Missouri at Rolla
Rolla, Missouri 65401

Dist. 6 Eddie Lane
3116 Hanover
Dallas, Texas 75225

Dist. 7 Warren Lee
University of Arizona
Tucson, Arizona 85721

Dist 8 Lewis C. Crowl
5207 J Street
Sacramento, California 95827

Dist. 9 Eugene Smith
Memphis State Univ.
Memphis, Tennessee 38111

Dist 10 Richard Melhart
Washington State University
Pullman, Washington 99163

District Secretaries

Dist. 1 Joseph Abraham
Hobart College
Geneva, New York 14456

Dist. 2 Joseph Abraham
Hobart College
Geneva, New York 14456

Dist. 3 Herman Bunch
N.C. State University
Raleigh, N. C. 27607

Dist. 4 Charles Vosler
Ohio University
Athens, Ohio 45701

Dist. 5 Lawrence Morgan
Kansas State University
Manhattan, Kansas 66502

Dist. 6 James Dodson
Midland High School
Midland, Texas 79701

Dist. 7 Troy Young
Arizona State University
Tempe, Arizona 85281

Dist. 8 William (Sam) Nakaso
San Jose City College
San Jose, California 95114

Dist. 9 Steve Moore
Tennessee Technological University
Cookeville, Tennessee 38501

Dist. 10 John Andersen
University of Washington
Seattle, Washington 98105

Committee Chairmen

Audio-Visual Aids - Gordon Stoddard
Certification - Lindsy McLean
Drug Education - John Wells
Ethics - L. F. "Tow"Diehm
Grants and Scholarships - W. E. "Pinky" Newell
History and Archives - Mike O'Shea
Honor Awards - George Sullivan
International Games - Charles "Chuck" Medlar
Journal - Rod Compton
Membership - Bruce Melin
National Convention - Fred Hoover
Placement - Rodney Poindexter
Professional Education - Sayers "Bud" Miller
Sub-Committee for Graduate Education - Gary Delforge
Public Relations - Dick Malacrea
Recruitment - Mel Blickenstaff
Research and Injury - Ted Quedenfeld

For jock itch and athlete's foot

Tinactin Cream

- Begins to relieve itching, burning within 24 hours
- Actually kills most skin ringworm fungi

Tinactin®

brand of tolnaftate, U.S.P., 1%

Professionally preferred

Also available in Powder and Powder Aerosol to help prevent athlete's foot reinfection.

ABSTRACTS

"Smoking Correlated With Meniscus Degeneration," William B. Pratt, M.D., **The Physician and Sports-medicine:** September, 1974.

In evaluation of knee problems, Dr. Pratt states that specific problems, such as degeneration of the meniscus, can be very puzzling, especially if there is no history of previous injury or deformity. One interesting observation that Dr. Pratt has been able to make, however, is that such patients usually were found to have a pack of cigarettes. In other words, they were smokers at the present or had been in the recent past. It was also observed that these individuals had other disease.

The interesting idea that Dr. Pratt is working with concerning this problems is that, in this nontraumatic process, there is something systematically wrong that deprives vulnerable structures of essential nutrients needed to withstand normal stresses. The path that nutrients take to the meniscus is very complex. However, the observation is that, because of smoking, there is poor absorption or that tissue perfusion is decreased. Therefore, the meniscus does not get the needed nutrients. The meniscus, therefore, cannot maintain its structure and function. If, under this condition, the body is stressed, the vulnerable parts such as the meniscus or articular cartilage may fail.

As Dr. Pratt readily points out, the finding needs to be better documented before any firm conclusion can be reached, yet it does bring up a very interesting observation.

Howard Swonigan

"Traumatic Bursitis and Artificial Turf," Larson, Robert L., M.D. and Osternig, Louis R., Ph.D., **Journal of Sports Medicine:** Vol. 2, NO. 4, July/August, 1974.

Doctor Larson and Professor Osternig conducted a survey at the end of the 1973 football season of the eight Pacific Eight conference schools. The survey requested information dealing with the number of cases of prepatellar and olecranon bursitis which were sustained on both grass and artificial playing surfaces.

Of the twenty-eight cases of prepatellar bursitis reported, 82.1 percent (23) occurred on artificial turf and 17.9 percent (5) occurred on sod. Sixteen cases of olecranon bursitis were reported with 87.5 percent (14) occurring on artificial turg and 12.5 percent (2) occurring on sod. Four of the schools in the Pac-8 conference have grass fields on which they practice and play their home games. The survey points out that the incidence of prepatellar and olecranon bursitis was doubled during road games on synthetic turf for these schools.

The authors deal with the problems of artificial turf and its ability to absorb impact in contrast to natural grass. They also discuss the classifications of bursitis, diagnosis of the condition, proper treatment and preventative and protective measures that can be used in dealing with prepatellar and olecranon bursitis.

Bradley Sherman

"The Safety of Ultrasound," Dewhurst, C.J., **Proc. Roy. Soc. Med.**, Vol. 64, Sept. 1971.

Although various investigations have concluded that clinical applications of ultrasound are safe, two recent papers (1970) warranted a review on this aspect by the questions they raised. Destructive ultrasound is used in medicine, but its potential to destroy tissue is dependent on the intensity used, frequency, whether the sound is continuous or pulsed, and the duration of sound passage. However, the intensity and time used in therapeutic ultrasonics is far below that of destructive applications (0.5-3.0 watts/cm2 for therapeutic as opposed to 22 watts/cm2 for destructive).

In order to test the validity of claims that ultrasound in the very low intensity used in diagnostics (below 30 microwatts per cm2) may bring about chromosomal aberrations in blood, a study was undertaken. The fetuses of twenty-four mothers about to terminate pregnancy by hysterotomy were insonated at such intensities. No increase in chromosomal aberration over reported incidence figures was found.

Although these results are neither complete nor conclusive, they provide no support for the argument of ultrasound being unsafe. Dewhurst does call for more safety research in this matter, but demands that it be carried out most carefully, so that it may hold up against critical analysis.

Greg Vergamini

"Olympic Participation by Women," Zaharieva, Ekaterina, **Journal of the American Medical Association**, Vol. 221, No. 9: 992-995, Aug. 28, 1972.

A twenty-year study, from 1952-1972, confirmed the fact that athletics has no harmful effects on pregnancy, childbirth and the post-partum period even though the athletes go through serious and strenous conditioning preceding the Olympic Games.

This study included 150 athletes: 27 Olympic, 59 masters of sport (those who compete on the national teams), and 64 first grade athletes. The

average age most of the Olympic athletes gave birth was between 21 and 25. seventy-two percent of these athletes' careers lasted six to ten years prior to pregnancy. Normal pregnancy was reported by 70 percent with 22 percent feeling more fit after childbirth. Normal complaints during the first stage of pregnancy was reported in 14 percent of the total study group.

The first stage of delivery is longer for the athlete because of ridigity of the uterus and muscle tone; the second stage is much shorter because of strong abdominal pressure. The most frequent complication is the disturbance to the perineum. Exaggerated stretching of the skin over the womb, as reported in 90 percent of non-athletes, occurred in 26 percent of the Olympic athletes and nearly 50 percent in the other two groups. All babies were mentally and physically normal.

Following delivery, lactation was interrupted in the seventh to ninth month for the Olympic and masters athletes, and fourth to sixth month for the first grade athletes. Regular training had no harmful effects of lactation in 48 percent of all athletes studied. When returning to training and competition after childbirth, the Olympic athletes waited the longest - three to five months for training, five to eight for competition.

Conclusions drawn from the study are:

1. Participation in Olympic Games has no harmful effects on the female sex organs,
2. although they have long careers prior to childbirth, the athletes have normal pregnancies,
3. better hygienic requirements and ceasing activity earlier result in the Olympic athletes having fewer problems during and after childbirth,
4. personal records of many improved after childbirth,
5. many felt more stable physically and more balanced psychologically.

Jan Tappon

"What Causes Second Wind," Shephard, Roy J., M.D., Ph.D, **Physician and Sportsmedicine**; Vol. 2, NO. 11, Novemebr, 1974.

The phenomena of second wind related to athletics and physical exertion is generally accepted, yet subjective in nature and not totally understood. In Dr. Shephard's article, second wind is described as a period during exercise when the characteristic features of exertion, including breathlessness, rapid shallow breathing, constriction in the chest, throbbing in the head and muscle pain are subdued, often suddenly, leaving the athlete relieved to varying degrees.

Studies have shown that on treadmill exercises, relief of breathing and leg soreness are noted. The second wind occurs at different times with different athletes, however, and most studies have shown no changes in heart or respiratory rates at the time of the second wind.

Dr. Shephard pursues possible explanations for second wind. The response of the body to breathlessness is a possibility, with possible relief coming from changes in respiratory volume per minute. The rate of release of lactate from the muscle and ventilation changes are considered factors, with direct relationship to intensity of effort and duration of activity. While exercising at a maximum aerobic level, lactate accumulates until the athlete is exhausted. At a more moderate rate, however, the metabolic acidosis appears early in exercise and then disappears, providing possible explanation for second wind. Another related condition might be stimuli which counteract vasoconstriction.

Some researchers related second wind to warm up, while still others link it to relieved intercostal fatigue. Both, however, generally appear as constituents too late in exercise. Tightness in the chest (brachospasm), generally decreases after ten minutes of exercise, providing still another solution. Carbon dioxide stores which are replenished as exercise continues may also contribute.

The feasibility of psychological factors must also be considered. A state of anxiety may cause tightness in the chest, which could be releived during exercise, giving the sensation of the second wind. Arousal by coaches and fans, a close race, or passing an opponent are all elements of reason concerning second wind.

An important aspect brought out by the author, in concluding, is the need for continued study and testing of second wind before any sound conclusions can be drawn. At this stage in research, many of the theories have not been substantiated, and often contradict other credible ideas.

Gary A. Baier

National
ATHLETIC TRAINERS ASSOCIATION

PRESIDENT
FRANK GEORGE
Brown University
Department of Athletics
Providence, Rhode Island 02912
Telephone: 401/863-2211

FROM THE PRESIDENT'S DESK

EXECUTIVE DIRECTOR
OTHO DAVIS
Philadelphia Eagles
Veterans Stadium
Philadelphia, Pa. 19148
Telephone: 215/463-2500

April 20, 1975

Dear NATA Member,

I'm looking forward to seeing you in Anaheim. The Convention Committee has provided us with an excellent program of many varied subjects. The emphasis of the Schering Symposium will be on musculo-tendinous injuries. Many thanks to Bill Chambers and the Convention Committee for all their efforts.

During the last four years Otho Davis, Executive Director of NATA, and other NATA members have been studying professional liability proposals. The proposal which the Board of Directors approved was submitted by Maginnis and Associates. This provides NATA Certified, Associate, and Student members with the highest coverage at the lowest possible premium rate. Investigate your situation for liability coverage. If you do not have adequate professional liability insurance, this program is a must.

In May, 1974 the Berkshire Sports Medicine Institute invited officers of NATA to participate in a workshop to develop a program for educating faculty-athletic trainers. The purpose of this program is to improve the medical care of the high school athlete. NATA believes the best way to improve the medical care of the high school athlete is for the school to hire a certified athletic trainer as a member of the faculty. If this is impossible, an alternative for the high school is to locate a memeber of the present faculty that is available and interested in serving as an athletic trainer. He or she must be willing to meet the NATA requirements to become a Certified Athletic Trainer. The concept of the Faculty-trainer educational program is to educate this interested faculty member as an athletic trainer. This will be accomplished by successful completion of three summer sessions, each session being five to six weeks in duration. The program can be offered through colleges with NATA approved educational programs or other institutions which meet NATA requirements. There are a few states which have shown a good deal of interest in this program. Please let your District Director know if you wish more information about this program.

Have a good summer, see you in Anaheim.

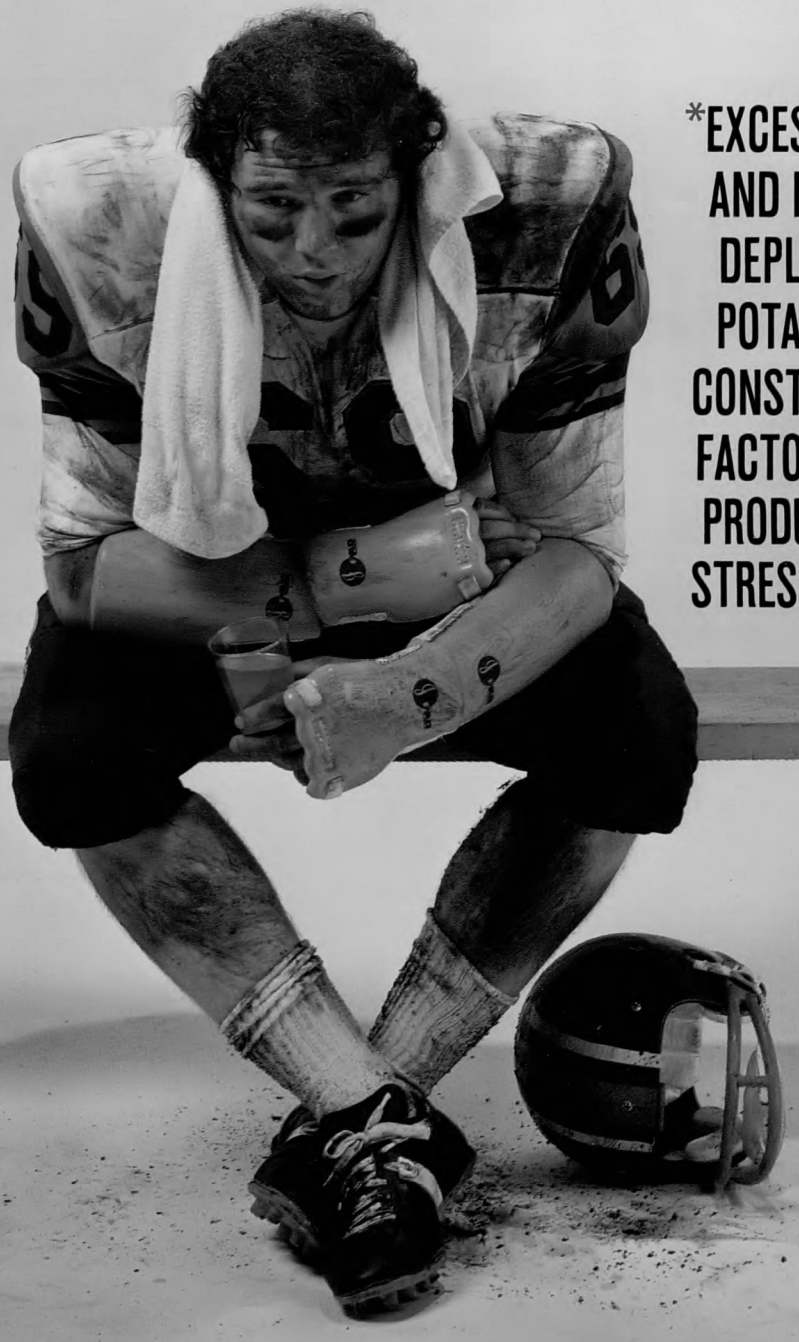
Sincerely,

Frank George

Frank George
President NATA

1975 Annual Meeting — Anaheim, California
Disneyland Hotel, June 7, 8, 9, 10, 11

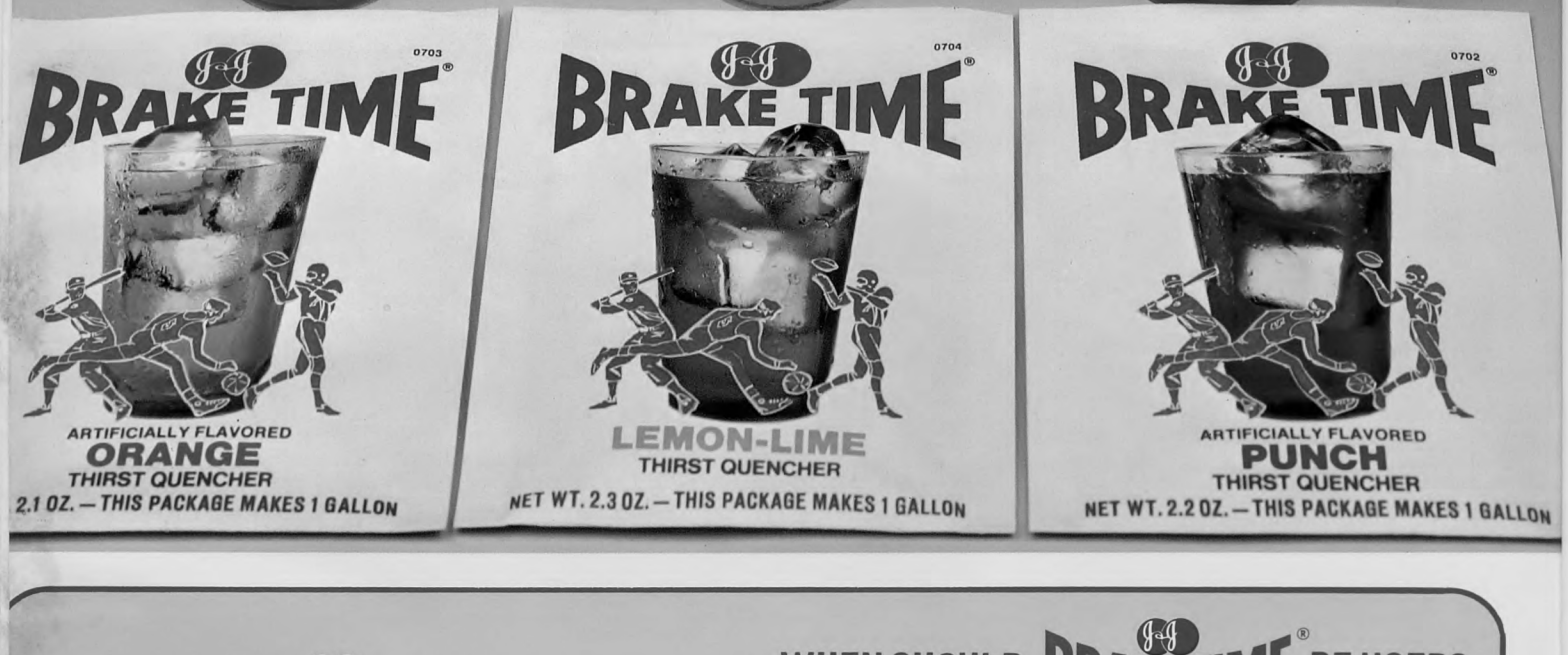
THIS ATHLETE COULD BE IN DANGER* ...UNLESS HIS BODY FLUIDS ARE REPLENISHED!



*EXCESSIVE FLUID LOSS AND ELECTROLYTE DEPLETION INCLUDING POTASSIUM CAN CONSTITUTE IMPORTANT FACTORS IN THE PRODUCTION OF HEAT STRESS COMPLICATIONS.

INTRODUCING A SCIENTIFICALLY BALANCED ELECTROLYTE DRINK

(refreshingly flavored)



WHAT IS BRAKE TIME®?

An IDEALLY BALANCED electrolyte drink — deliciously flavored to provide:

- Optimized concentrations of salt electrolytes — similar to ranges found in sweat.
- A hypotonic solution with low sugar levels to facilitate faster body fluid replacement.
- A balanced replacement level of potassium to help replenish losses in body potassium during exercise.

WHY SHOULD BRAKE TIME® BE USED?

Excessive fluid loss and electrolyte depletion during vigorous exercise constitutes important factors in the production of heat stress complications. The best preventive is acclimatization. Intake of fluids containing adequate amounts of electrolytes, including potassium, is also recommended. BRAKE TIME is a scientifically formulated drink containing balanced quantities of important electrolytes.

WHEN SHOULD BRAKE TIME® BE USED?

Before, during, and after pronounced physical activity—"BRAKE TIME—ANY TIME!"

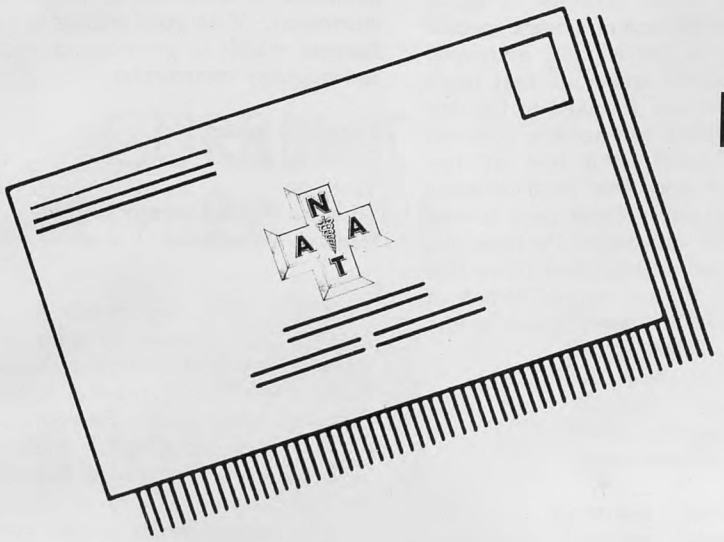
Available from your athletic goods distributor.

BRAKE TIME THIRST QUENCHER			
Code	**Flavor**	**Size**	**Case Pack**
0702	Punch	1 Gal.	25 ea.
0703	Orange	1 Gal.	25 ea.
0704	Lemon-Lime	1 Gal.	25 ea.
0705	Punch	5 Gal.	5 ea.
0706	Orange	5 Gal.	5 ea.
0707	Lemon-Lime	5 Gal.	5 ea.

Contact your J&J Athletic Division salesman for further details.

Johnson & Johnson
ATHLETIC DIVISION
NEW BRUNSWICK, NEW JERSEY 08903

 AD-157



LETTERS TO THE EDITOR

Dear Editor:

Recently in a discussion it came to my attention that there are athletic trainers in the profession who suture, aspirate and inject in the course of their duties.

Is this an everyday occurance in athletic training? What is the legality of such occurances? Is this an ethical practice?

I am currently a second term graduate student trainer at Michigan State University and was wondering if you would elaborate on your views or those of the Journal as to the questions above. I would think it imperative that some standards be set to guide the student athletic trainer, if not for his own protection, at least for those he is treating.

Thank you for your time and consideration.

Sincerely,
Bill Armstrong
Graduate Assistant
Athletic Trainer
Michigan State University

The following statement is a result of my conference with NATA President, Frank George, Executive Director, Otho Davis, and Attorney Laurence S. Graham, Greenville, North Carolina.

With one exception the NATA has no specific policy as to athletic trainers who suture, aspirate and inject in the course of their duty. This exception relates to any action which would be inconsistent with the scope of Article I, Section 8 of the NATA Code of Ethics which provides in part as follows:

The NATA takes a strong stand against the unauthorized use and nontherapeutic use of drugs...Any trainer who violates this stand of unauthorized and nontherapeutic use of drugs for himself or for others is guilty of a breach of ethics.

A spot check of the several trainers in District 3 reveals that they do not perform any of the functions which you have questioned except under the direct supervision of a licensed physician and then only under extreme conditions and at the request of the physician.

Although the laws vary from state to state it is generally considered unlawful to perform any of the acts which you have mentioned without the direct supervision and direction of a licensed physician. Any trainer performing these functions could incur both criminal and civil liability.

In addition to the section of the Code of Ethics which has been quoted above, Article I, Section 3 of our Code of Ethics provides:

The trainer must carry out the details of the doctor's orders but not go beyond the scope of the trainer's duties or the doctor's instruction.

At present the Board of Directors of NATA is considering setting forth a specific policy as to suturing, aspirating, injecting as well as other duties which may possibly invade the province of a licensed physician. It is suggested that any individual performing the functions of a trainer should familiarize himself or herself with the laws of their state relating to the unauthorized practice of medicine and any criminal or civil liability that might result from a violation of such laws.

Editor

* * *

Dear Editor:

I am conducting research on various methods of ankle taping methods utilized by trainers and coaches. Any trainer or coach that would like to submit ankle taping methods can do so by sending it to the address below. A complete description is needed; and if possible, pictures or drawings should accompany the description.

Your assistance will be appreciated.

Andrew St. John
Student Trainer
Dept. H.P.E.R.
Georgia College
Milledgeville, GA. 31061

Trainers get those cards and letters rolling in.

Editor

* * *

Dear Editor:

I am writing in reference to the "Not for Men Only" column of the March 1975, issue of the Journal.

Contained in the introduction and body of "The Injury Prone Athlete" was the repetitive interjection of he/she and his/her. I find the use of such adjectives distracting in that it interrupts the natural flow of thought as set forth by the author.

Where one feels a need to be concerned with the selection of adjectives in reference to sex, nouns of neuter gender may be utilized, i.e., participant, individual, or athlete. The use of such substitutions would serve the same "inclusive" purpose. In addition, not only would the effectiveness of the article be enhanced, but the reader could then enjoy the manner in which the article was written.

Sincerely,
Liz White
Graduate Student Trainer
East Carolina University

The following letter was also received concerning this topic.

Editor

Dear Editor:

Ms. Holly Wilson has shared with me Liz White's communication to you concerning the use of he/she and his/her in my recent article entitled "The Injury Prone Athlete." I agree with her that the use of nonsex specific terms, such as participant, individual or athlete would make the text more readable, and look forward to the day when such usage will become common practice. However, I feel at the current time there is a need to make the readers aware of the need to end sexism in the language. Perhaps the use of the dual pronoun can serve this function to those whose level of awareness has not been raised to the level of Ms. White's!

Sincerely,
Bonnie Slatton
Assistant Professor

* * *

Dear Editor:

In the copy of the *Athletic Training* Vol 10, NO. 1., March 1975) there is a book which caught my attention.

It was **First-Aid Management: Athletic, Physical Education, Recreation** by Joseph P. Dolan and Lloyd J. Holladay, price $8.95. However, no publisher is mentioned. This means it is virtually impossible to order this book.

Could you advise me of the publisher of the book in which I am interested? With good wishes to your **Journal** which is growing in stature and mightily informative

Faithfully yours,
David R. Bett
Director
Western Physiotherapy Center
Weston, Ontario

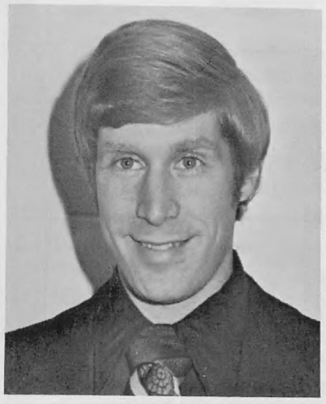
Thank you very much for your interest. In response to your letter, we wish to advise that the publisher of First-Aid Management; Athletic, Physical Education, Recreation *by Joseph Dolan and Lloyd J. Holladay is The Interstate Printers & Publishers, Inc., of Danville, Illinois.*

You may reorder using reorder number 1604.

Should any reader need further information on any books appearing in "Book Reviews" simply write:

Ken Murray, A.T., C.
Eastern Kentucky University
Richmond, Kentucky 40475

CURRENT LITERATURE



by Ed Christman
Certified Athletic Trainer

"A Brief Look at Back Strain," Brenner, S. **Consultant,** 190 Moore Street, Hackensack, N.J. 07601. 12:129, September, 1972.

"Acute Occlusion of the Subclavian Vein in an Athlete: Diagnosis, Etiology, and Surgical Management," Wright, R. and Lipscomb, B. **The Journal of Sports Medicine**, 428 East Preston Street, Baltimore, Maryland 21202. 2:343-348, November-December, 1974.

"Ankle Sprain: Not Always a Minor Injury," Novich, M. **Consultant,** 12:73, September, 1972.

"Baseball Pitching Injuries in Growing Athletes," Lipscomb, A. **The Journal of Sports Medicine**, 3:25-34, January-February, 1975.

"Cardiac Stroke Volume: Effects of Athletic Training," Cumming, G., **The Journal of Sports Medicine,** 3:18-24, January-February, 1975.

"Conditioning the Dodgers," Weiskopf, D. **Athletic Journal,** 1719 Howard Street, Evanston,Illinois 60202. 55:50, March, 1975.

"Do Long Hair and Football Uniforms Impair Heat Loss?" Cooter, G. **The Physician and Sportsmedicine,** 4015 West 65th Street, Minneapolis, Minnesota 55435. 3:55, February, 1975.

"Effects of Therapeutic Ultrasound on Bone Marrow in Dogs," Payton, O., Lamb, R., and Kasey, M. **Physical Therapy**, 1156 15th Street, N.W., Washington, D.C. 20005. 55:20, January, 1975.

"Exercise," Mayer, J. **Family Health,** Portlant Place, Boulder, Colorado 80302. 7:43, February, 1975.

"Growing Weak By Degrees," Stewart, J. **Sports Illustrated,** 541 N. Fairbanks Ct., Chicago, Illinois 60611. 42: 58-59, March 10, 1975.

"Helical Instability of the Knee: A Concept and Surgical Reconstruction," White, J. **The Journal of Sports Medicine**, 2:329-342, November-December, 1974.

"Hernia Happens in Women, Too," Glassow, F., **Consultant,** 11: 67, November, 1971.

"Improving Functional Ability in Any Sport," Jones, A. **Athletic Journal,** 55: 70, March, 1975.

"In Season Football Weight Training," Juvenal, J. **Scholastic Coach,** 50 West 44th Street, New York, New York 10036. 43: 96-99, February, 1974.

"Inferiority of Female Athletes: Myth or Reality," Wilmore, J. **The Journal of Sports Medicine,** 3: 1, January-February, 1975.

"Injuries of Wrestling," Lok, V. and Yuceturk, G. **The Journal of Sportsmedicine,** 2: 324-328, November-December, 1974.

"Muscle Soreness in Baseball," Allen, E. and Schlitz, Jr. **Athletic Journal,** 55: 48, February, 1975.

"Physique, Muscle Strength and Cardiovascular Fitness of Weight Lifters," DePauw, D. et al. **Journal of Sports Medicine and Physical Fitness,** 12: 193-200, September, 1972.

"Predicting Athletic Performance," Bar-Or, O. **The Physician and Sportsmedicine,** 3: 80, February, 1975.

"Preventing Injury in Sports," Jones, A. **Athletic Journal,** 55: 24, February, 1975.

"Ski Jumping Injuries," Bland, P. **The Physician and Sportsmedicine,** 3: 62, February, 1975.

"Soft Tissue Injuries," Bland, P. **The Physician and Sportsmedicine,** 3: 62, February, 1975.

"Soft Tissue Injuries," **Emergency Product News,** P.O. Box 926, Encinitas, California 92024. 10: 12, September-October, 1974.

"Sports Injuries: Don't Let Them Throw You," Ferguson, A. **Consultant,** 11: 15, November, 1971.

"Strength Training for the Female Athlete," Darden, E. **Woman Coach Magazine,** P.O. Box 867, Wallingford, Conn. 06492. 1: 24-25, March-April, 1975.

"Swimming and Cardiovascular Fitness in the Older Age Group," Arthur, R. **The Journal of Sportsmedicine,** 3: 35, January-February, 1975.

"The Cooling, Analgesic, and Rewarming Effects of Ice Massage on Localized Skin," Bagaj, R. **Physical Therapy,** 55: 11-19, January, 1975.

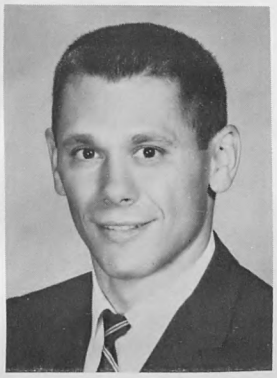
"The Etiology and Treatment of Tennis Elbow," Nirschl, R., **The Journal of Sports Medicine,** 2: 308-319, November-December, 1974.

"Treating Injuries of the Head, Face, and Neck," **Emergency Product News,** 10: 8, September-October, 1974.

"Ways to Prevent and to Treat Shin Splints," Albohm, M. **Woman Coach Magazine,** 1: 26-30, March-April, 1975.

"Winter Sports Hazards - Covert Considerations," hayes, D. **The Physician and Sportsmedicine,** 3: 71, February, 1975.

POTPOURRI



Dennis Aten
Certified Athletic Trainer

PROFESSIONAL LIABILITY INSURANCE

Premiums for medical malpractice insurance has been increasing at an alarming rate. It has been reported that some physicians (especially in high risk specialities) are paying premiums in excess of $20,00 annually. It is impossible to predict future court settlements and how intangibles such as inflation will affect them. With higher settlements being the rule insurance companies have been losing money in this area and are consequently raising premiums. Congressional parties and lobbyists presently are discussing methods of holding down premiums, however there does not appear to be an easy, clear cut answer to this problem.

So far athletiac trainers have not been hit by huge premium increases such as those discussed above, however some malpractice insurance programs for health professionals (athletic trainers, physical therapists, etc.) have premiums in the $400.00 range.

Another problem concerning this topic is the question raised regarding the suitability of some liability programs. It is possible that some of the cheaper liability insurance policies were not designated to cover malpractice. It has been suggested that every athletic trainer check his own policy in this regard. While on the topic, how many athletic training programs provide for or make available malpractice insurance coverage to their student trainers?

HOSPITAL REPORTED GRID INJURIES HIGH

During the reporting period of October 1974 football equipment and apparel related injuries accounted for more than half of the total injuries reported in all sporting or recreational activities. These statistics are taken from the National Electronics Injury Surveillance Systems (NEISS). Bicycle related injuries were second.

WHAT'S YOUR FOOD I.Q.

The March 1975 issue of **Readers Digest** has an interesting article concerning nutrition. Interesting comments included the following:

a. Organically grown foods are **not** more nutritious than "chemically fertilized" foods.
b. Natural foods are **not** always safer than artificial foods and sometimes they are not as safe.
c. There is no scientific documented evidence to support claims that Vitamin E has special curative powers.
d. Extra doses of vitamin A can have toxic effects.
e. Large amounts of vitamin C can be dangerous.

Since athletic trainers are involved so often with special diets, food supplements, and ergogenic aids; we might all do well to do further study in this area.

DON'T SHAKE THE BABY

Many common practices such as throwing a baby in the air or shaking a child as a form of reprimand can cause brain damage according to Dr. John Coffey, a pediatrician and professor of radiology at the University of Pittsburgh. The combination of weak neck muscles and a relatively heavy head in children contribute to the danger. Even moderate shaking a couple of times a week might have a cumulative effect on a child's developing brain. Depending on the severity of the shaking, the damage can cause a range of problems from mild retardation to death.

The pediatrician recommends when playing with an infant, that you avoid jiggling or jerking its head, don't hold them by the ankles and swing them around, and never shake a child by the shoulders or slap it on the head as punishment. It is probably wise to remember these cautions when we get lax on insisting on properly fitted helmets.

AMA PUBLICATIONS

Available from the AMA headquarters office in Chicago are two publications which may be of interest to athletic trainers. The first is a 441 page reference book, **Revised Allied Medical Education Directory"** which lists all of the educational efforts of 25 allied health occupations. The second publication is **"The Medical Aspects of Sports - 15"** which is published by the AMA support from the Sports Medicine Foundation of America. Articles on hand and neck injuries, basketball, tennis, and post surgical rehabilitation highlight this book.

PREP DRUG USE

Continual headlines appear in our newspapers across the country, regardless the use of drugs by athletes.

More recently the references have been emphasizing the drug use by prep athletes. This is distressing for two reasons. First, it is always bad to see youth involved in experiences that at best will do minimal harm and give no help, and at worst can destroy their life. The second distressing aspect involves the reference of drugs in athletics when a youth that is connected with an athletic team is experimenting with some form of drug. It would seem preferable to limit discussion regarding drug abuse in athletics to the drugs used, without medical guidance, for the express purpose of attempting to improve or extend athletic performance. Other drug abuse would seem to be as a result of the individual's involvement with society as a whole and not just athletics. It would appear unjust to put the burden of guilt of increased pot parties on athletics just because some of the party goers happen to be athletes. It should be resented by those in athletics when the inference is made that if you are in athletics you must be on drugs of some kind.

SCREENING PROGRAMS

The American Academy of Orthopedic Surgeons recently approved the following statement concerning school screening programs:

> *"The AAOS hereby gives its official recommendation to any program of routine examination of school children for the detection of scoliosis and other crippling spine disorders. The Academy recognizes that by early detection more appropriate treatment of this disabling health problem can be carried out."*

This appears to be a natural area of involvement for the high school athletic trainer, coach, or physical educator. A screening program could very easily be developed with the combined efforts of the school health nurse and the athletic trainer under the direction of an area orthopedist.

ACCIDENTS ASSOCIATED WITH HOCKEY EQUIPMENT

An estimated 30,000 persons received hospital emergency room treatment during the 1973 fiscal year for injuries associated with hockey equipment.

Lacerations, fractures, strains/sprains, and contusions/abrasions are the most frequent product-related injuries. They most often result from: being hit by a puck, hit by a stick, cut by a skate, being checked, or falling into the sideboards of the rink.

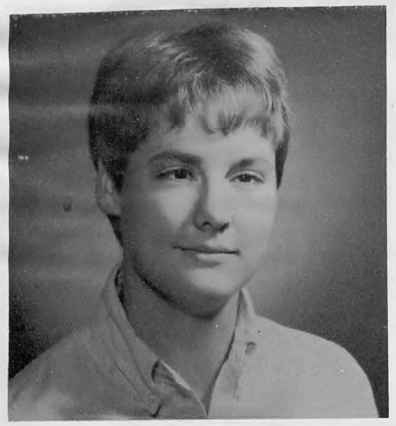
Injuries to the head and face, including the eyes, ears, and mouth, accounted for 64 percent of the total injuries reported, or 1,009 injuries in the danger area of the head. Eleven concussions were reported, and almost all of the remaining facial and head injuries were fractures, lacerations, or contusions/abrasions.

Injuries to the lower arm (6 percent), lower leg (11 percent), and the fingers (7 percent), accounted for most of the remaining NEISS-reported cases.

A total of 843 lacerations, 373 contusions/abrasions, 155 fractures, and 140 strains/sprains were recorded during the period.

The age span from primary through high school registered almost 80 percent of the injuries. The age groups 10-14 and 15-19 each reported 35 percent of the total injuries and the group 5-9, 8 percent. Only 12 percent of the injuries occurred to the age group 20-23, and 9 percent to eprsons 25 years and older. Of the total 1,607 injuries recorded during the period, 91 percent (1,457) were to males.

Not For Men Only



Holly Wilson

Certified Athletic Trainer

Harley Feldick, M.D., is Director of the Student Health Service and Team Physician at the University of Iowa. Since arriving at the University in 1971, Dr. Feldick has been instrumental in establishing health care programs for male and female athletes, both interscholastic and intercollegiate, throughout the state. In 1972, he initiated a study to determine why the football players at Iowa had suffered nine cervical spine injuries. The study is still in progress and involves not only the athletes at the University of Iowa but those participating in high school football in the state. Findings indicate that many players suffer neck injuries during their high school careers that were either not reported in their medical histories or not diagnosed. In 1973 and 1974, a series of sports medicine clinics were presented across Iowa so high school coaches could meet the state's requirements for the Coaching Certification that was recently made mandatory.

I asked Dr. Feldick to reflect back on his first year, 1974-75, of working in an organized athletic training program for the female athletes and the problems encountered during the year. He discusses some of the expected organizational problems, that actually never occurred, and some common injuries and suggestions for their prevention.

"Since the Fall of 1973 Women's Intercollegiate Athletics has been a recognized and progressive entity on the University of Iowa campus. Young women are now given the opportunity to participate in competitive sports on an intercollegiate basis. The intercollegiate program is made up of 10 sports including field hockey, volleyball, basketball, gymnastics, swimming, tennis, badminton, golf, and track and field. The program has inticed many girls to become active in athletics; many have had previous experience in high school athletic programs prior to arriving on the unversity campus and many are now to the arena of competitive intercollegiate athletics, having had no programs in their high schools. At least, finally, the girls have been given the opportunity to participate in a sport or sports of their choosing. This increased number of athletes, almost equalling the number of men in intercollegiate athletics, has almost doubled the demand on practice space, locker rooms and training rooms with their personnel.

Training room facilities have essentially become co-ed and has presented no major problems, and the training room staff includes male and female certified trainers and student trainers. With practice areas being in essentially the same areas emergency care is provided in the available training facilities for both men and women. Routine treatment and rehabilitation is provided by the training staff for men and women athletes. Our present training staff includes three full time trainers and eight student trainers, nine men and two women. We have four certified trainers. Any of the training staff may cover men's or women's athletics as the need arises.

Women participating in athletics during the past two years have presented a predominance of particular problems, these being 'shin splints' and patellar chondromalcia. Both entities have been the result of inadequate conditioning or too rapid a progression in the training and conditioning program. Many of the female athletes have proceeded from a relatively physically inactive state to one in which the lower extremities are subjected to unaccustomed stress particularly to the plantar flexors of the foot causing the 'shin splints' and to the quadriceps with associated stress on the patella causing chondromalcia. Both entities are painful, primarily require rest for alleviation of symptoms and are therefore time consuming.

The athlete suffering from 'shin splints' should engage in an isometric program involving the plantar and dorsal flexors of the foot. Manual resistance is applied as the foot moves through its normal range of motion - plantar flexion, dorsal flexion, inversion and eversion. Ice massage and warm whirlpools may be of some benefit when used in conjunction with the isometric program. Rehabilitation exercises for the athlete with patellar chondromalcia consist of quad setting and straight leg lifts to build up the quadriceps mechanism. Salicylates should be taken, two four times a day, to aid in the healing process. Again, ice massage and warm whirlpools may be helpful.

Physical problems in the female athlete are primarily, at this point of our experience, due to inadequate progressive conditioning as tolerated. Progressive cardio-respiratory conditioning would induce progressive conditioning of the muscles and joints of the lower extremity which is essential in preventing 'shin splints' and patellar chondromalcia. Isometric exercises and/or progressive resistance exercises should be included in the women's conditioning program. Training staffs and coaches must realize that for the female as well as the male excellence and success in the physical activity of athletics is going to depend primarily on physical conditioning.

May women have continued opportunity to participate in the physical activity of competitive athletics, realize the need of physical conditioning but still "Viva la differance!"

Harley Feldick, M.D.

* * * *

In March of 1975, the Board of Directors of the National Association for Girls and Women in Sport (NAGWS) unanimously passed the following platform statement supporting the N.A.T.A.'s efforts in the preparation of qualified trainers.

The National Association for Girls and Women in Sport has been formed out of recognition of the need to develop, encourage, foster and support sports programs for girls and women.

Desirable sports programs for girls and women are specifically enhanced by this organization by formulating and publicizing guiding principles, standards and policies for the administrator, leader, official, coach and player.

An integral part in providing a safe and wholesome sports program for girls and women is an N.A.T.A. certified athletic trainer. The athletic trainer, as a result of paramedical training, is more qualified to deal with the prevention, recognition and care of athletic injuries than a coach.

The objectives of the National Athletic Trainers Association are to advance, encourage and improve the athletic training profession. The organization oversees the educational preparation of the student trainer by specifying guidelines for athletic training curriculums and qualifications for certification. Only by meeting the standards of the N.A.T.A. can a trainer become a certified athletic trainer.

Therefore, NAGWS supports the N.A.T.A.'s goal of providing every secondary school and institution of higher education engaged in interscholastic or intercollegiate competition with a well qualified trainer (N.A.T.A. Certified) and the efforts of the N.A.T.A. to professionally prepare young men and women for a career as a trainer.

* * * *

LITERATURE REVIEW:

"Exploding the Myth of Female Inferiority," by Jack Wilmore in **The Physician and Sportsmedicine**, May, 1974.

The unquestioned assertion that the female athlete is physiologically inferior to her male counterpart may need closer examination as indicated by a recent review of literature by Wilmore. It appears the female may not be too far behind the male in body composition, strength and endurance. Evidence shows that the female athlete has a lower fat percentage than that commonly accepted for her sex - 10-15 percent greater than the male. In fact, the highly trained female runner has a fat percentage that is similar to the male runner, which is usually less than 10 percent. Concerning strength, the male is far superior in the upper body, but in the lower body, the difference between the sexes almost disappears when related to body weight and lean body mass. Lack of large amounts of the male hormone could account for this difference. In endurance, if one again considers lean body weight, the maximum oxygen uptake of the female is approximately equal to the male.

Implications: Conditioning programs for female athletes should be essentially the same as those for her male counterpart. In weight training the increments will be lighter and not taken as rapidly.

"Conditioning for Stress in Sports," by Dorothy Harris in **DGWS Research Reports: Women in Sports, Vol. II.** Washington, D.C.: AAHPER, 1973.

"Is efficiency in heat dissipation sex linked or developed through stress?" This is an interesting and timely question raised by Harris concerning the female's susceptibility to heat stress. It is known the female has a higher skin temperature in heat than the male because of the insulation derived from the subcutaneous layer of fat. In addition, the female does not sweat until she is 2-3 degrees warmer than the male and she has fewer functional sweat glands. Consequently the cost of maintaining the core temperature within its critical range in a hot environment is greater for the female.

Implications: Further research needs to be done on the susceptibility of the female athlete to heat stress and her ability to acclimatize to the environment.

Interesting Reading:

The American Woman in Sport by Ellen Gerber, Jan Felshin, Pearl Berlin and Waneen Wyrick. Reading, Massachusetts: Addison-Wesley Publishing Company, 1974.

"Inferiority of Female Athletes: Myth or Reality," by Jack Wilmore in **The Journal of Sports Medicine**, January-February 1975.

"Special Problems of the Female Athlete," by Clayton Thomas, M.D. in **Sports Medicine** edited by Allan Ryan, M.D. and Fred Allman, Jr., M.D. New York: Academic Press, 1974.

Cramer - GWS Co-Sponsored Athletic Training Workshops - Summer 1975

Date	Site	Coordinator
June 16-20	Emporia Kansas State College Emporia, Kansas 66801	Jeanne Galley
June 23-27	University of California-Riverside Riverside, California 92502	Donna Knox
July 8-12	Austin Peay State University Clarksville, Tenn. 37040	Lea Larson
July 14-18	Texas Woman's University Denton, Texas 76204	Joanna Kuhn
July 21-25	Temple University (Sugar Loaf) Philadelphia, Pa 19122	Ted Quedenfeld
August 4-8	University of Indiana Bloomington, Indiana 47401	Marge Albohm
August 11-15	Mankato State College Mankato, Minnesota 56001	Gordon Graham

CALENDAR OF COMING EVENTS

June 6-12, 1975 - The New England School of Athletic Training will have a 56 hour course for trainers, coaches, physical education instructors, and students at Massachusetts Maritime Academy, Buzzards Bay, Massachusetts. For details contact: New England School of Athletic Training, P.O. Box 396, Buzzards Bay, Massachusetts 02532.

June 7-8 - The Annual Sports Medicine Conference will be held at the San Francisco Medical Society and State University. For further information contact James M. Glick, M.D., San Francisco Medical Society, 250 Masonic Avenue, San Francisco, California 94118.

June 8-11 - The National Athletic Trainers Association Convention will be held in Anaheim, California at the Disneyland Hotel. For further information contact Otho Davis, Executive Director, N.A.T.A., Philadelphia Eagles, Veterans Stadium, Philadelphia, Pennsylvania 19148, or Bill Chambers, Fullerton College, Fullerton, California 92634.

June 15-21 - The American Physical Therapy Association will be held in Anaheim, California at the Disneyland Hotel. For further information contact Mr. Royce Noland, Executive Director, A.P.T.A., 1156 15th Street, N.W., Washington, D.C. 20005.

June 15-18 - Cramer Products and Marshall University will sponsor a student trainers workshop in Huntington, West Virginia. Contact Hugh Grubiss, Cramer Products, .Inc., Gardner, Kansas 66030, for further information.

June 15-18 - Cramer Products and Colorado State Unviersity will sponsor a student trainer workshop in Fort Collins, Colorado. For further information contact Hugh Grubiss, Cramer Products, Inc., Gardner, Kansas 66030.

June 16-20 - Cramer Products and Emporia Kansas State College will sponsor a workshop for women in athletic training in Emporia, Kansas. Contact Jeanne C. Galley, Director of Women's Athletics, Emporia Kansas State College, Emporia, Kansas 66801.

June 23-27 - Cramer Products and the University of California will sponsor a workshop for women in athletic training in Riverside, California. For further information contact Donna Knox, Department of Physical Education for Women, P.O. Box 112, University of California, Riverside, California 92502.

June 29-July 2 - Cramer Products and Austin College will sponsor a student trainers workshop in Sherman, Texas. Interested persons should contact Hugh Grubiss, Cramer Products, Gardner, Kansas 66030.

June 30-July 3, 1975 - The Medical School at Case Western Reserve will be the site for a postgraduate workshop for athletic trainers, sponsored by the Rainbow Sports Medicine Center. For details contact: Lynn Wallace, Room 486, 2103 Adelbert Road, Cleveland, Ohio, 44106.

June 30-July 3 - The Rainbow Sports Medicine Center will sponsor a post graduate course for trainers at Case Western Reserve University, School of Medicine, Cleveland, Ohio. Interested trainers can contact Lynn Wallace, L.P.T., Rainbow Sports Medicine Center, 2103 Adelbert Road, Room 486, Cleveland, Ohio 44106.

June 6-9 - Cramer Products and Emporia Kansas State College will sponsor a basic athletic training course for interested high school or college students in Emporia, Kansas. For further information contact Hugh Grubiss, Cramer Products, Inc., Gardner, Kansas 66030.

July 6-9 - Cramer Products and Southwest Texas State University will sponsor a basic course in athletic training in San Marcos, Texas. Contact Hugh Grubiss, Cramer Products, Inc., Gardner, Kansas 66030, for further information.

July 6-9 - Cramer Products and Western Illinois University will sponsor a basic athletic training course for high school or college students in Macomb, Illinois. Interested persons can contact Hugh Grubiss, Cramer Products, Inc., Gardner, Kansas 66030.

July 6-9 - Cramer Products and Ohio State University will sponsor a basic course in athletic training in Columbus, Ohio. For further information contact Hugh Grubiss, Cramer Products, Inc., Gardner, Kansas 66030.

July 7-16 - The School of Physical Education at West Virginia University will offer a two week workshop in athletic training on both a credit and a non-credit basis. For additional information contact Dean C. P. Yost, School of Physical Education, West Virginia University, Morgantown, West Virginia 26506.

July 8-12 - Cramer Products and Austin Peay State University will sponsor a basic course in athletic training for women in Clarksville, Tennessee. Interested persons can contact Lea Larson, Department of Health and Physical Education, Box 2540, Austin Peay State University, Clarksville, Tennessee 37040.

July 13-16 - Cramer Products and Clemson University will sponsor a basic course in athletic training for high school and college students in Clemson, South Carolina. For futher information contat Hugh Grubiss, Cramer Products, Inc., Gardner, Kansas 66030.

July 13-16 - Cramer Products and the University of Southern Mississippi will sponsor a basic athletic training course for interested students in Hattiesburg, Mississippi. For informtion contact Hugh Grubiss, Cramer Products, Inc., Gardner, Kansas 66030.

July 14-18 - Cramer Products and Texas Women's University will sponsor a basic course in athletic training for women in Denton, Texas. Interested women should contact Joanna Kuhn, Department of Physical Education, P.O. Box 23717, TWU Station, Denton, Texas 76204.

July 19-25 - The American Corrective Therapy Association will hold its annual conference in Chicago at the Sheraton-Chicago Hotel. For further information contact Robert Massey, 4201 Western Avenue, Western SPrings, Illinois 60558.

July 20-23 - Cramer Products and East Tennessee State University will sponsor a basic workshop in athletic training in Johnson City, Tennessee. For information contact Hugh Grubiss, Cramer Products, Inc., Gardner, Kansas 66030.

July 20-25, 1975 - The Piedmont Student Trainers Camp will be held at Camp Hanes, near Winston-Salem, N.C. in conjunction with the Eighth Annual Piedmont Football Camp. For details contact Rod Compton or Ken Hayes, Piedmont Student Trainer Camp, YMCA, P.O. Box 11306, Bethabara Station, Winston-Salem, N.C. 27106.

July 21-25 - Cramer Products and Temple University will sponsor a basic athletic training course for women in Philadelphia, Pennsylvania. Interested persons should contact Ted Quedenfeld, Temple University, Broad and Montgomery Streets, Philadelphia, Pennsylvania 19122.

July 28-30 - The Annual Meeting of the American Orthopardic Society for Sports Medicine will be held in New Orleans at the Marriott Motor Hotel. For further information contact Bernard R. Cahill, M.D., American Orthopaedic Society for Sports Medicine, 416 St. Mark Court, Peoria, Illinois 61603.

July 31-August 1 - The Rainbow Sports Medicine Center will sponsor an advanced student trainers course in Cleveland, Ohio. Interested persons can contact Lynn Wallace, L.P.T., Rainbow Sports Medicine Center, 2103 Adelbert Road, Room 486, Cleveland, Ohio 44106.

August 3-6 - Cramer Products and West Chester State College will sponsor a basic athletic training course in West Chester, Pennsylvania. For further information contact Hugh Grubiss, Cramer Products, Inc., Gardner, Kansas 66030.

August 4-8 - Cramer Products and the University of Indiana will sponsor a basic course in athletic training for women in Bloomington. Interested women can contact Marge Albohm, Assembly Hall, University of Indiana, Bloomington, Indiana 47401.

August 4-8 - The Rainbow Sports Medicine Center will sponsor a beginning student trainer course in Cleveland. For information contact Lynn Wallace, L.P.T., Rainbow Sports Medicine Center, 2103 Adelbert Road, Room 486, Cleveland, Ohio 44106.

August 4-7 - Cramer Products and Mankato State College will sponsor a student trainers course in Mankato, Minnesota. Interested persons can contact Hugh Grubiss, Cramer Products, Inc., Gardner, Kansas 66030.

August 7-9 - The American Academy of Orthopaedic Surgeons will sponsor a course in "Prevention and Treatment of Orthopaedic Wound Infections." For further information contact J. Philip Nelson, M.D., 1707 East 18th Street, Denver, Colorado 82018.

August 10-13 - Cramer Products and Northwestern University will sponsor a basic athletic training course for high school or college students in Farmington, Massachusetts. For further information contact Hugh Grubiss, Cramer Products, Inc., Gardner, Kansas 66030.

August 11-15 - Cramer Products and Mankato State College will sponsor a basic course in athletic training for women. Interested persons should contact Gordon Graham, Department of Athletaics, Mankato State College, Mankato, Minnesota 56001.

August 12-16 - Cramer Products and Highline School District will sponsor a course in student athletic training in Camp Waskowitz, Washington. Contact Hugh Grubiss, Cramer Products, Inc., Gardner, Kansas 66030, for further information.

September 8-10 - The American Academy of Orthopaedic Surgeons will sponsor "The Knee in Sports." Contact Gerald A. O'Connor, M.D., for information by writing to 326 North Ingalls Street, Ann Arbor, Michigan 48104.

September 22-24, 1975 - The Sheraton Valley Forge Hotel will be the location of the meeting, "Sports Medicine and Private Practice," sponsored by McGraw Hill Publications and Hahnemann Medical College. For further information contact: Robert Schaefer, Dept. of Continuing Education, Hahnemann Medical College, 230 North Board Street, Philadelphia, Pa. 19102.

Athletic Training will be happy to list events of interest to persons involved in sports medicine, providing we receive the information at least two months in advance of publication. Please include all pertinent information and the name and address of the person to contact for further information. This information should be sent to Jeff Fair, Athletic Department, Oklahoma State University, Stillwater, Oklahoma 74074.

THE STUDENT TRAINER'S CORNER

N.A.T.A. BOARD OF CERTIFICATION
RECOMMENDED READING LIST

The following references have been selected by the N.A.T.A. committee on certification as a possible guideline for independent study for certification candidates not matriculating in N.A.T.A. approved curriculums in athletic training. This list is only a suggested guide line, and it is not the wish of the committee to imply that examination questions come directly from these sources or that other references would not be equally useful in study preparation for the examination.

I. Suggested Primary References
Basic Science:

deVries, Herbert A., **Physiology of Exercise for Physical Education and Athletics**, Dubuque, Iowa, 1966, Wm. C. Brown Company.

Kimber, Diana C. and Gray, Carolyn E., **Anatomy and Physiology**, XV Edition, New York, 1966, Maxmillian.

Wells, Katherine, **Kinesiology**, 5th Edition, Philadelphia, 1971, W.B. Saunders Company

Applied Science; Athletic Training, Theory and Techniques; Therapeutic Modalities:

American Red Cross, **Standard First Aid and Personal Safety**, 1973, Doubleday & Co.

Dayton, O. William, **Athletic Training and Conditioning**, New York, 1965, The Ronald Press.

Dolon, Joseph P. and Holladay, Lloyd J., **Treatment and Prevention of Athletic Injuries**, Third Edition, Danville, Illinois, 1967, Interstate.

Fundamentals of Athletic Training, Chicago, 1971, American Medical Association.

Klafs, Carl E., and Arnheim, Daniel D., **Modern Principles of Athletic Training**, 2nd Edition, St. Louis, 1969, C.V. Mosby Company.

Morehouse, Lawrence E. and Rasch, Phillip J., **Sports Medicine for Trainers**, 2nd Edition, Philadelphia, 1963, W.B. Saunders Company.

Watkins, Arthur L., **A Manual of Electrotherapy**, Third Edition, Philadelphia, 1968, Lea and Febiger.

II. Suggested Supplemental Reference List [for more complete study]

Basic Science:

Anthony, Catherine P., **Textbook of Anatomy and Physiology**, 7th Edition, St. Louis, 1967, C.V. Mosby.

Guyton, Arthur C., **Function of the Human Body**, 3rd Ed., Philadelphia, 1969, W.B. Saunders.

Hollingshead, W. Henry, **Functional Anatomy of the Limbs and Back**, 3rd Ed., Philadelphia, W.B. Saunders.

Karpovich, Peter, **Physiology of Muscular Action**, 6th Ed., Philadelphia, 1966, W.B. Saunders.

Morehouse, Lawrence E. and Miller, Augustus T., **Physiology of Exercise**, 5th Ed., St. Louis, 1967, C.V. Mosby.

Rasch, Phillip and Burke, Roger, **Kinesiology and Applied Anatomy**, 4th Ed., Philadelphia, 1971, Lea and Febiger.

Thompson, Clem W., **Manual of Structural Kinesiology**, 6th Ed., St. Louis, 1969, C.V. Mosby.

Applied Science, Athletic Training Theory and Techniques:

Ferguson, Albert, M.D. and Bender, Jay, **The ABC's of Athletic Injuries and Conditioning**, Baltimore, 1964, Williams and Wilkins.

Hirata, Isao Jr., M.D., **The Doctor and the Athlete**, Philadelphia, 1969, J.B. Kippincott.

Klein, Karl K. and Allman, Fred L. Jr. M.D., **The Knee in Sport**, Austin, New York, 1969, Jenkins Publishing Co.

Matthews, David O. and Thompson, Richard A. D.O., **Athletic Injuries, A Trainer's Manual and Textbook**, Dubuque, Iowa, 1963, Wm. C. Brown.

O'Donoghue, Don H., M.D., **Treatment of Injuries to Athletes**, Philadelphia, 1970, W.B. Saunders Co.

Rawlinson, Ken, **Modern Athletic Training**, Englewood Cliffs, New Jersey, 1961, Prentice-Hall, Inc.

Taber, Clarence W. M.D., **Taber's Cyclopedic Medical Dictionary**, 11th Ed., Philadelphia, 1969, F.A. Davis, Ed.

Standard Nomenclature of Athletic Injuries, Chicago, 1966, American Medical Association.

Therapeutic Modalities, Theory and Techniques:

Beard, Gertrude and Wood, Elizabeth, **Massage Principles and Techniques**, Philadelphia, 1964, W.B. Saunders.

Klein, Karl K. and Allman, Fred L. Jr. M.D., **The Knee in Sport**, Austin, New York, 1969, Jenkins Publishing Co.

Licht, Sidney, **Therapeutic Heat and Cold**, 2nd Ed., New Haven, 1965, Licht.

Licht, Sidney, **Therapeutic Exercise**, 2nd Ed., New Haven, 1965, Licht.

For additional information contact:
NATA Board of Certification
c/o Lindsy McLean
1000 S. State Street
Ann Arbor
Michigan 48104

BOOK REVIEWS

Ken Murray
Certified Athletic Trainer

Editor's Note:

Please note that in the September 1974 issue of **Athletic Training** *the senior author of* **Modern Techniques of Track and Field** *was incorrect. His name is Robison and not Robins.*

EVERY KID CAN WIN

By Terry Orlick and Cal Botterill
List Price $6.95
187 Pages
Limited Illustration

Nelson-Hall Publishing Company
325 West Jackson Boulevard
Chicago, Illinois

Many times we get our perspective of what athletics is all about confused. We forget what the youngsters are and why they are competing in athletics. We forget that not all kids can, or should, participate in athletics. Through this book, **Every Kid Can Win**, our realization was put back into focus. Even though the reviewer does not agree with everything the authors wrote, it did help him to think and re-evaluate his own thinking.

The following are the titles of the chapters in this book:

"What Can You Do For Kids?"
"The Right Start"
"Why Eliminate Kids?"
"What About Winning?"
"What's Best for Kids?"
"What Do You Feel?"
"What Can You Expect From Kids?"
"It's Got To Be Fun"
"What About Girls?"
"Make Sports a Better Place for Kids"
"Every Kid Can Win"

I would recommend this book for parents, teachers, coaches and any trainer who needs to reflect on what athletics is all about. An enjoyable, relaxing book.

A MANUAL FOR STUDENT ATHLETIC TRAINERS

by Larry J. Kellogg
and Cal S. Kellogg
List Price ?
135 Pages
Illustrated

Miami Springs High School
Miami Springs, Florida

This manual is designed for guiding the inexperienced student-trainer with simplified techniques and instructions to perform his regular duties. Subjects covered include guides to materials needed for equipping a training room, techniques in taping, splinting and supporting, a discussion of rehabilitation, emergency and life-saving procedures, responsibilities and duties of the trainer, and injury recognition and evaluation techniques. This manual is full of illustrations which help the reader have a clearer idea of how things are done and shows proper methods and techniques which may be used.

Features are presented which will help students learn. Included is the use of simple, yet essential, terminology which aids in becoming familiar with anatomy and the correct terminology to use. Also included are injury flow charts which help in making a primary or on-the-spot evaluation pertaining to a particular injury. Basic anatomy is covered which the author feels will help in increasing the trainer's knowledge and understanding.

The author feels that this book would make a good text or guidebook for the new student trainer and all those involved in learning basic principles of athletic training. A good addition to the trainer, coach and student trainer's library.

ANNOUN

MEMORIAL

On the eve of last year's Indiana State Basketball Tournament, March 22, 1974, all Lafayette Jefferson High School athletes and fans lost a great friend and helper in trainer Harold Cordell. He had served as Jeff trainer for the past twenty-two years and was one of the most respected men in his field. He was one of the very few high school trainers to be certified by the National Athletic Trainers Association.

Harold graduated from Jeff and was a starting guard on the Broncho football team for three years. He graduated from Purdue, majoring in physical education and minoring in science. He taught science at Sunnyside Junior High School and was head of that department.

This past year the Jefferson Golden Broncho Club named their highest award in his honor. The Harold Cordell award goes to the outstanding senior who distinguishes himself both in academics and athletics for the Bronchos.

Harold was more than a trainer, he was loved and respected by all the athletes and coaches at Jeff. He was a "right hand man" to all the coaches and he will surely be missed as a trainer but even more so as a man.

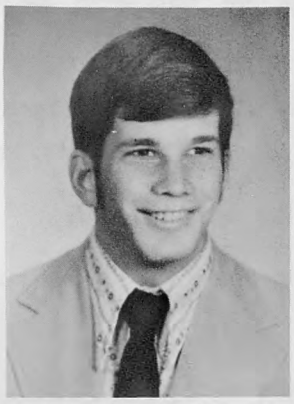
MEMORIAL

William Maner Bostwick, 72, died April 21, 1975 in a Charleston, S.C. hospital.

For over 50 years Mr. Bostwick was involved with coaching and athletic training, first as head football coach at Charleston High School, then as head trainer at The Citadel.

Surviving are his widow, Mrs. Florence Easterlin Bostwick; a son, William Maner Bostwick; a stepson, Harold E. Todd; a sister, Mrs. John B. Bell; six grandchildren and three great grandchildren.

MEMORIAL



Samuell McConnell, 20, a student trainer at Georgia Tech in Atlanta, Georgia, passed away on May 25, 1974. Sam served as student-trainer for all sports at Osborne Junior and Senior in Marietta, Georgia. Upon graduation from Osborne, Sam attended Valdosta State College in Valdosta, Georgia and served as student-trainer for the 1973 baseball team.

Sam transferred to Georgia Tech in the fall of 1974 to work as a student-trainer for the Georgia Tech Football Team. Bill McDonald, Head Athletic Trainer at Georgia Tech, reports that "Sam McConnell was one of the most dedicated student-trainers with whom I have been associated. Sam was a very hard worker and a credit to the athletic training profession."

Survivors include his father, Paul L. McConnell of Marietta, Georgia and a sister, Mrs. Rick Stanford of Quantico, Virginia.

NATIONAL ATHLETIC TRAINERS ASSOCIATION

EDUCATIONAL PROGRAMS LEADING TO PROFESSIONAL CERTIFICATION IN ATHLETIC TRAINING

Programs listed here are approved by the National Athletic Trainers Association. For detailed information, write to the program director whose name is given in parentheses in the listing. Two basic plans of education for athletic training are listed in the following key:

(1) Bachelor's degree level curriculum
(2) Master's degree level curriculum
(3) Accepts women students

ARIZONA

UNIVERSITY OF ARIZONA (2, 3)
Department of Health, Physical Education and Recreation, Tucson, Arizona 85721 (Gary Delforge or Peggy Anderson, Physical Education for Women)

ARIZONA STATE UNIVERSITY (1, 3)
Department of Health, Physical Education and Recreation, Temple, Arizona 85281 (Troy Young)

CALIFORNIA

CALIFORNIA STATE UNIVERSITY FULLERTON (1, 3)
Department of Health, Physical Education and Recreation, Fullerton, California 92634 (Jerry Lloyd)

CALIFORNIA STATE UNIVERSITY LONG BEACH (1, 3)
Department of Physical Education Long Beach, California 90840 (Dr. Daniel Arnheim)

CALIFORNIA STATE UNIVERSITY NORTHRIDGE (1, 3)
Department of Physical Education and Athletics, Northridge, California 91324 (Chuck Wolcott)

ILLINOIS

EASTERN ILLINOIS UNIVERSITY (1, 3)
School of Health, Physical Education and Recreation, Charleston, Illinois 61920 (Dennis Aten)

WESTERN ILLINOIS UNIVERSITY (1, 3)
College of Health, Physical Education and Recreation, Macomb, Illinois 61455 (Roland E. LaRue)

INDIANA

BALL STATE UNIVERSITY (1, 3)
Department of Men's Physical Education, Muncie, Indiana 47306 (Ronald Sendre)

INDIANA UNIVERSITY (1, 3)
School of Health, Physical Education and Recreation, Bloomington, Indiana 47401 (Robert Young or Sam Newberg)

INDIANA STATE UNIVERSITY (1, 2, 3)
School of Health, Physical Education and Recreation, Terre Haute, Indiana 47809 (Mel Blickenstaff)

PURDUE UNIVERSITY (1)
Athletic Department, Mackey Arena West Lafayette, Indiana 47907 (William E. Newell)

ICEMENTS

IOWA

UNIVERSITY OF IOWA (1, 3)
Department of Intercollegiate Athletics, Field House, Iowa City, Iowa 52240 (Ed Crowley)

LOUISIANA

LOUISIANA STATE UNIVERSITY (1, 3)
Department of Health, Physical Education and Recreation, Baton Rouge, Louisiana 70803 (John Wells)

MASSACHUSETTS

NORTHEASTERN UNIVERSITY (1, 3)
Department of Physical Education, Boston-Bouve College, Boston, Massachusetts 02115 (Kerbor Kassabian)

SPRINGFIELD COLLEGE (1, 3)
Towne House Center, Springfield, Massachusetts 01109 (Sherrod W. Shaw)

MICHIGAN

CENTRAL MICHIGAN UNIVERSITY (1, 3)
School of Health, Physical Education and Recreation, Mount Pleasant, Michigan 48859 (Kenneth Kopke)

MINNESOTA

MANKATO STATE COLLEGE (1, 3)
Physical Education Department, Mankato, Minnesota 36001 (Gordon Graham)

MONTANA

UNIVERSITY OF MONTANA (1, 3)
Department of Health, Physical Education and Recreation, Missoula, Montana 59801 (Dr. Walter C. Schwank, Chairman or Naseby Rhinehart)

NEW MEXICO

UNIVERSITY OF NEW MEXICO (1, 3)
Department of Health, Physical Education and Recreation, Albuquerque, New Mexico 87131 (L.F. Diehm)

NORTH CAROLINA

APPALACHIAN STATE UNIVERSITY (1, 3)
Department of Health, Physical Education and Recreation, Boone, North Carolina 28607 (Ron Kanoy)

EAST CAROLINA UNIVERSITY (1, 3)
Sports Medicine Division, P.O. Box 3247, Greenville, North Carolina 27834 (Rod Compton)

NORTH DAKOTA

UNIVERSITY OF NORTH DAKOTA (1, 3)
Department of Health, Physical Education and Recreation, Grand Forks, North Dakota 58201 (Jeffrey S. Monroe)

OHIO

OHIO UNIVERSITY (1, 3)
Athletic Department, Convocation Center, Athens, Ohio 45701 (Charles Vosler)

OREGON

OREGON STATE UNIVERSITY (1, 3)
Physical Education Department, Corvallis, Oregon 87331 (Richard F. Irwin)

UNIVERSITY OF OREGON (1, 3)
College of Health, Physical Education and Recreation, Eugene, Oregon 97403 (Lou Osternig)

PENNSYLVANIA

EAST STROUDSBURG STATE COLLEGE (1, 3)
Koehler Fieldhouse, East Stroudsburg, Pennsylvania 18301 (Lois F. Wagner)

SLIPPERY ROCK STATE COLLEGE (1, 3)
Health Science Department, Slippery Rock, Pennsylvania 16057 (Dr. James R. Pennell)

THE PENNSYLVANIA STATE UNIVERSITY (1, 3)
102 Sports Research Building, University Park, Pennsylvania 16802 (Sayers J. Miller)

WEST CHESTER STATE COLLEGE (1, 3)
School of Health and Physical Education, West Chester, Pennsylvania 19380 (Phillip Donley)

TEXAS

LAMAR UNIVERSITY (1)
Department of Intercollegiate Athletics, P.O. Box 10066 Lamar Station, Beaumont, Texas 77710 (Paul Zeek)

SOUTHWEST TEXAS STATE UNIVERSITY (1, 3)
Department of Health and Physical Education, San Marsoc, Texas 78666 (Dr. Bobby Patton)

STEPHEN F. AUSTIN STATE UNIVERSITY (1, 3)
Department of Health and Physical Education for Men, Nacogdoches, Texas 75961 (Joe E. Richardson)

TEXAS CHRISTIAN UNIVERSITY (1)
Department of Athletics, Fort Worth, Texas 76129 (Elmer Brown)

WASHINGTON

WASHINGTON STATE UNIVERSITY (1, 3)
Department of Physical Education for Men, Pullman, Washington 99163 (Richard Melhart)

NATA ENDORSED STUDENT ATHLETIC TRAINING PROGRAMS

Date: June 15-18, 1975

Location: Moby Gym, Colorado State University, Fort Collins, Colorado 80523

Sponsor: Fred Oglesby
Colorado State University
Fort Collins, Colorado 80523

* * *

Date: June 15-18, 1975

Location: Gullickson Hall, arshall University, Huntington, West Virginia 25704

Sponsor: Vic Winburn
Marshall University
Huntington, West Virginia 25704

* * *

Date: June 29-July 2, 1975

Location: Gym — Beardsley Arena, Austin College, Sherman, Texas 75090

Sponsor: Laurence Morgan
Kansas State University
Manhattan, Kansas

* * *

Date July 6-9, 1975

Location: Currens Hall, Western Illinois University, Macomb, Illinois 61455

Sponsor: "Duke" RaRue
Western Illinois University
Macomb, Illinois 61455

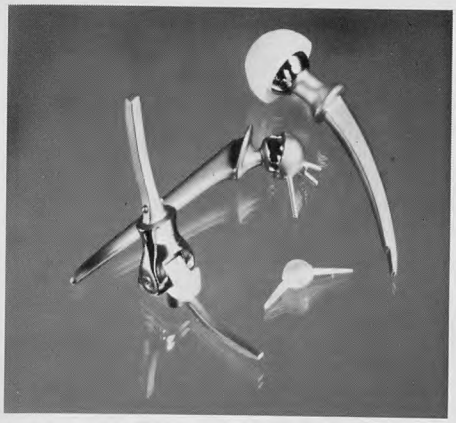
Tubigrip® is better than bandage...

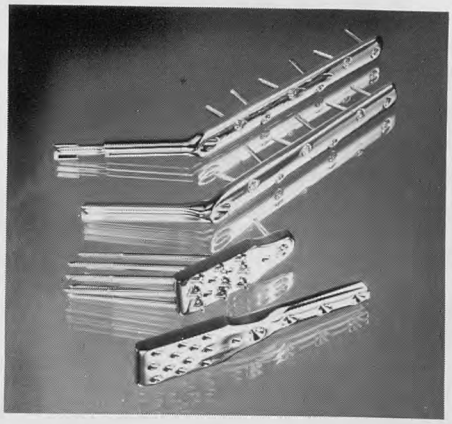
Tubigrip is a flexible knitted tube, made of fine quality cotton and strong latex yarn. Tubigrip pressure is smooth, even and equal. Extra pressure can be easily and evenly applied, if needed.

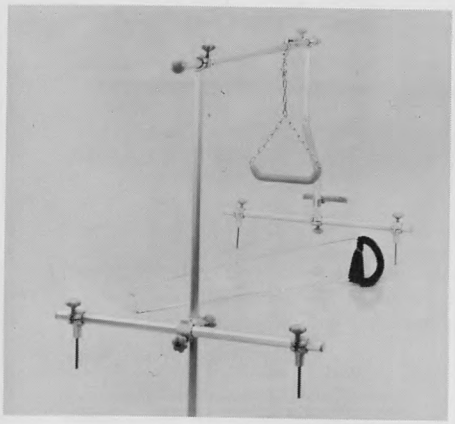
Tubigrip can't unwind. It has no loose ends. It's a better solution for workers and athletes — for almost everybody. Patients can easily remove and replace it themselves. Its effectiveness depends on size selection, not wrapping technique.

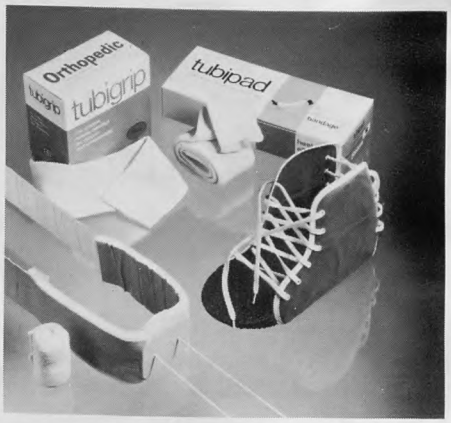
Tubigrip is a roll in a box, ready to cut to length. There's a Tubigrip size to hold dressings on the smallest hands. And there's a Tubigrip size to fit athletically bruised ribs. And sizes in between.

Stop bandaging. Tubigrip.









and only OEC has it... plus all of this.

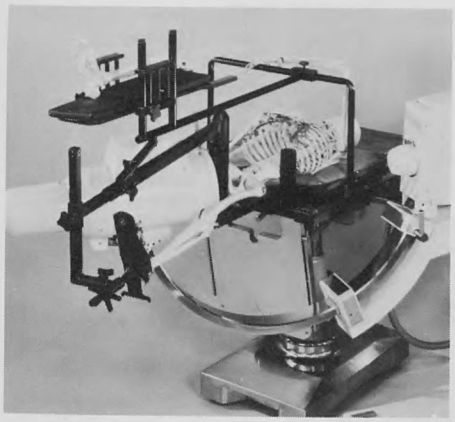
Tubigrip is manufactured by Seton Products, Ltd. of Great Britain. It is available in the United States exclusively from Orthopedic Equipment Company.

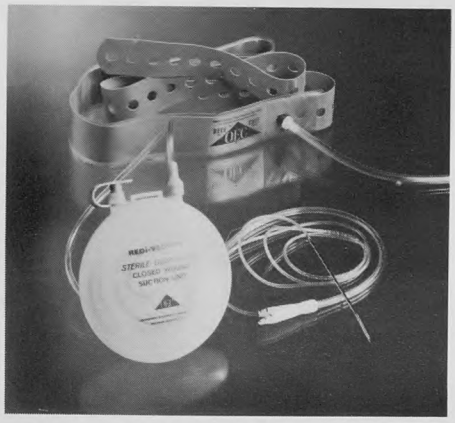
Tubigrip is one more of the many products available from OEC for the care and treatment of musculo-skeletal problems.

These products include: Prostheses and implants for reconstructive joint procedures and fracture treatment · Splints and soft goods for effective and comfortable immobilization · Strong, durable traction frames and accessories · Orthopaedic surgical instruments · Rehabilitation aids · Surgical positioning devices · Mobile surgical X-ray with image intensification · Disposable surgical tourniquets and closed-wound suction apparatus · Pneumatic surgical instrumentation · Surgical clean-air systems.

For full information or an in-service demonstration on Tubigrip (or any other OEC product) contact your OEC representative, or write OEC.

OEC®
ORTHOPEDIC
EQUIPMENT COMPANY, INC.
BOURBON, INDIANA 46504





ANNOUNCEMENTS Continued

Date: July 6-9, 1975

Location: Hines Gym
Southwest Texas State University,
San Marcos, Texas 78666

Sponsor: Bobby Patton
Southwest Texas University
San Marcos, Texas 78666

* * *

Date: July 6-9, 1975

Location: Biggs Athletic Training Facility, The Ohio State University, 2490 Fyffe Road, Columbus, Ohio 43210

Sponsor: Mike Bordner and Billy Hill
The Ohio State University
Columbus, Ohio 43210

* * *

Date: July 6-9, 1975

Location: Physical Education Building, Emporia Kansas State College, Emporia Kansas 66801

Sponsor: John Baxter
emporia Kansas State College

Emporia, Kansas 66801

* * *

Date: July 13-16, 1975

Location: Jervey Athletic Center, Clemson University, Clemson, S.C. 20631

Sponsor: Fred Hoover
Clemson, S.C. 29631

* * *

Date: July 13-16, 1975

Location: Field House, University of Southern Mississippi, Harriesburg, Ms. 39401

Sponsor: Larry Harrington
University of Southern Mississippi
Hattiesburg, Mississippi 39401

* * *

Date: July 13-18, 1975

Location: Convocation Center, Ohio University, Athens, Ohio 45701

Sponsors: Charles Vosler
Ken Rusche
Ohio University
Athens, Ohio 45701

* * *

Date: July 20-23, 1975

Location: Memorial Gymnasium, East Tennessee State University, Johnson City, Tennessee 37601

Sponsor: Jerry Robertson
East Tennessee State University
Johnson City, Tennessee 37601

* * *

Date: July 28-August 1, 1975

Location: Athletic Department, Wright State University, Col Glenn Highway, Dayton, Ohio 45431

sponsor: David H. Shon
#121, 251 W. Dayton-Yellowsprings Rd.
Fairborn, Ohio 45324

* * *

Date: July 31-Aug. 1, 1975

Location: Case Western Reserve School of Medicine, Sears Tower, 2119 Abington Road, Cleveland, Ohio

Sponsor: Lynn Wallace, L.P.T., A.T.C.
27400 Chardon Road #722
Willoughby Hills, Ohio 44094

* * *

Dae: August 4-8, 1975

Location: Case Western Reserve School of Medicine, Sears Tower, 2119 Abington Road, Cleveland, Ohio

Sponsor: Lynn Wallace, L.P.T., A.T.C.
27400 Chardon Road #722
Willoughby Hills, Ohio 44094

* * *

Date: August 10-13, 1975
Location: Hayden Lodge — Warren Center, 529 Chestnut Street, Boston-Bouve College, Northeastern University, Ashland, Massachusetts 01621

Sponsor: Kerkor Kassabian
Northeastern University
360 Huntington Avenue
Boston, Massachusetts 02115

* * *

Date: August 3-6, 1975

Location: South Campus Health & P.E. Center, West Chester State College, West Chester, Pennsylvania 19380

Sponsor: Phil Donley
West Chester State College
West Chester, Pennsylvania 19380

* * *

Date: August 4-7, 1975

Location: Student Union, Mankato State College, Mankato, Minnesota 56001

Sponsor: Gordon L. Graham
Mankato State College
Mankato, Minnesota 56001

* * *

Date: August 12-16, 1975

Location: Camp Waskowitz, Highline School District #401, North Bend, Washington

Sponsor: Gary Reinholtz
23612 100th Ave. A-11
Kent, Washington 98031

NATA ENDORSED PROFESSIONAL ATHLETIC TRAINING PROGRAMS

Date: June 30-July 3, 1975

Location: Case Western Reserve School of Medicine, Sears Tower, 2119 Abington Road, Cleveland, Ohio

Sponsor: Lynn Wallace, L.P.T., A.T.C.
27400 Chardon road #722
Willoughby Hills, Ohio 44094

* * *

Date: July 6-12, 1975

Location: Massachusetts Maritime Academy, buzzards Bay, Mass. 02532

Sponsor; Frank Challant
Boston Celtics — Boston Garden
Boston, Massachusetts

* * *

Date: June 30-July 3, 1975

Location: Langton Hall, Oregon State University, Corvallis, Oregon 97330

Sponsor: Richard F. Irvin
Oregon State University
Corvallis, Oregon 97330

* * *

Date: July 14-18 and 21-25

Location: Brophy Hall, Western Illinois University, Macomb, Illinois 61455

Sponsor: Roland "Duke" LaRue
Athletic Trainer
Western Hall
Western Illinois University
Macomb, Illinois 61455

* * *

Date: June 16-20, 1975

Location: Women's Gymnasium, Emporia Kansas State College, Emporia, Kansas 66801

Sponsor; John Baxter
Emporia Kansas State College
Emporia, Kansas 66801

ANNOUNCEMENTS

Continued

Date; June 23-27, 1975

Location: Women's Gymnasium, University of California — Riverside, Riverside, California 92502

Sponsor: Don Chu, Ph.D.
California State University
25800 Hillard
Hayward, California 94542

* * *

Date: July 8-12, 1975

Location: Women's Gymnasium, Austin peay State University, Clarksville, Tennessee

Sponsor: Rod Compton

East Carolina University
Sports Medicine Division
Box 3247
Greenville, North Carolina
27834

* * *

Date: July 14-18, 1975

Location: Women's Gymnasium, Texas Woman's University, Denton, Texas 76204

Sponsor: John Baxter
Emporia Kansas State College
Emporia, Kansas 66801

* * *

Date: July 21-25, 1975

Location: Women's Gymnasium, Temple University, Philadelphia, pa.

Sponsor: Ted Quedenfeld
Temple University
Philadelphia, Pa. 19122

* * *

Date: August 4-8, 1975

Location; Women's Gymnasium, University of Indiana, Bloomington, Indiana

Sponsor: Bob Young
University of Indiana
Bloomington, Indiana 47401

* * *

Date: August 11-15, 1975

Location: Women's-Gymnasium, Mankato State College, Mankato, Minnesota

Sponsor: Gordon Graham
Mankato State College
Mankato, Minnesota 56001

Editor's Note:

The Bobby Gunn Scholarship is for $500.00, and not $1500.00 as stated in the March 1975 Issue of **Athletic Training.**

The Role of Biomechanics in Sports Medicine

by
Walter Zingg, M.D.
Toronto, Ontario

Walter Zingg - 1948 graduated in Medicine, University of Zurich, Switzerland. Training in Surgery, Pathology, Physiology, in Switzerland, U.S.A. and Canada. 1957-1964 Director of Surgical Research, University of Manitoba, Winnipeg. Since 1964 Chief of Surgical Research, The Hospital for Sick Chidlren, Toronto, Ontario. Associate Professor, Department of Surgery, Unviersity of Toronto. Member, Institute of Biomedical Engineering, University of Toronto. Research Consultant, Ontario Crippled Children's Center, Toronto.

Athletic trainers are familiar with the analysis of forces. Some of the forces involved are studied in detail and analyzed, for instance with motion pictures. The purpose of training for athletics is to maximize the output of work (energy), of power (energy per unit time), or of action (energy times time). The output of work is limited by many factors. In this paper some constraints imposed by the properties of the living tissues are considered.

The physical scientist studies materials not only because he wants to optimize their use, but also with the aim of producing new and better materials. The biological scientist is much more restricted. He can only modify existing materials, and that only to a limited degree. On the other hand the biological materials have the unique properties of self-repair. Growth - another unique property of living tissue - will not be discussed.

As a result of various insults the function of a given tissue or organ may be impaired. Repair and regeneration then take place restoring function partially or completely. For some organs and systems, tests have been devised to assess the degree of restoration of a given function but following injuries of the musuloskeletal system the assessment of function and tolerance is difficult.

The function of the musculoskeletal system is mechanical. Therefore, a mechanical function test to assess, for instance, the strength of a healing fracture of a bone, would be helpful because it would determine the time when the bone can be exposed to a full load again. Such a test is not available. The management of the patients depends on indirect evidence, such as radiography, and on clinical experience.

Mechanical studies reported in the bioengineering literature are difficult for some to understand because of the engineering terminology. The question may appear to be simple. How strong is the Achilles tendon 10 weeks after rupture, treated by immobilization? How strong is a tibia 6 months after a spiral fracture treated in a given way? The answer, provided by the analysis of the biological materials will be complex.

Terminology

How is the strength of a material (living or dead) defined? Gordon (1) writes, "Lest there be any possible, probable shadow of doubt, strength is not, repeat not, the same thing as stiffness. Stiffness, Young's modulus or E, is concerned with how stiff, flexible, springy or floppy a material is. Strength is the force or stress needed to break a thing. A biscuit is stiff but weak, steel is stiff but strong, nylon is flexible (low E) and strong, raspberry jelly is flexible (low E) and weak. The two properties together describe a solid about as well as you can reasonably expect two figures to do."

A strong material, therefore, requires a large force to break it. It is intuitively obvious that the size of the material must be considered. It requires more force to break a thick rope than to break a fine string, although the materials may be identical. The term stress is introduced to describe Force per Unit Area. The rope has a much larger cross-sectional area than the string. The same force applied to both results in a much smaller stress in the rope than in the string. When we push or pull on the material, it will change its shape, it deforms. Again it is intuitively apparent that the degree of deformation depends on the size of the material. The term strain is introducte to relate the amount of deformity, for instance stretch, under load to the original length. Finally the speed with which a certain force is applied, must be considered. A rapidly applied stress is said to have a "high rate of stress" producing a "high rate of strain". Rate indicates stress or strain in relation to time.

Strength must be further defined. Materials may be strong enough to withstand certain forces, but not others. A string may have a very high strength to withstand a tensile force, but has little compressive strength of practical value.

Tensile strength is easy to define. It is the force necessary to break a string, or a tendon, or a piece of skin by pulling at both ends in opposite directions. Again the strength depends on the size of the piece of

material being tested. Therefore, the tensile strength usually is expressed as the breaking stress, the breaking load (force) per unit area. It is expressed in units such as pounds per square inch.

Compressive strength is more difficult to define. Why should anything ever break when it is compressed? Before answering this question the statement should be made that in this paper only a very simple explanation of the engineering data is presented. In reality the situation is much more complex and difficult to understand, in part because of the peculiar engineering jargon. One of the difficulties is that bodies are three-dimensional and the forces usually are acting in all three dimensions. However, most of us find it difficult to visualize changes taking place simultaneously in three dimensions.

In compression the individual parts and the molecules of a body are pressed closer together, so - why should the body break? If a rod - or a bone - is increasingly compressed along its axis, at some moment it will buckle and break. When it buckles it is no longer exposed to a compressive stress only but also to bending. The rod, therefore, breaks in bending when compressed.

A bone - or a rod - can also be broken by pure bending, for instance by a skier who falls straight forward while his boots are fixed to the skies. He may bend his tibia and fibula until they break. This type of simple bending is not simple at all from the engineering standpoint. The concave side the bone is under compression and on the convex side it is under tension and in between there is a neutral zone. Bone breaks first on the tension side.

Even more complicated is the analysis of a torsion fracture. This may happen to a skier when the body is in a rotation while the foot is fixed, resulting in a spiral fracture of the tibia. This is a good example to introduce shearing forces and shearing stresses. A "normal" stress is a force per unit area acting perpendicular to the area. A "shear" stress if a force per unit area acting parallel to the area. The shear forces which are present in bending and in torsion can be calculated.

To complete the discussion of mechanical terms, the concept of energy is introduced. Energy is the capacity to do work. It is assumed that the reader is somewhat familiar with the concepts of potential energy, kinetic energy, that the total amount of energy in a system is constant, and that energy can be transferred from one body to another within a system. Energy cannot disappear, it can only be transferred.

To explain this phenomenon consider a ball which falls to the ground and bounces back. The bell is held at a certain distance above the ground, therefore, it has a certain amount of potential energy which can be calculated. When it bounces back with a certain velocity it has kinetic energy, which again can be calculated. The kinetic energy on bouncing back will be smaller than the original potential energy because some energy is lost in the course of the experiment. But where is the energy during the split second the ball is on the ground? It has no potential energy because it is on the ground, and it has no kinetic energy because it has a velocity of zero. At that moment the ball is deformed. The deformation produces a strain and internal stresses. That is where the energy is - it is temporarily stored within the material as strain energy and is released when the ball bounces back. Thus in this simple system the initial potential energy is first transformed into strain energy and then into kinetic energy. If the strain and internal stresses exceed the strength of the material, it will break.

Strain energy is put to practical use

Continued on next page

in springs. Winding the spring of a watch adds strain energy to the spring. As the spring unwinds it releases the energy to keep the mechanism of the watch going. If too much energy is added to the spring it will break. At the moment a spring or another piece of material breaks, a considerable amount of energy may be released in a very short period of time. The resulting force is very powerful and may be explosive.

By testing a material in the appropriate test apparatus the following parameters can be measured or caluclated:

Strength (tensile strength)
Elasticity (stiffness or ability to stretch)
Absorption of energy

All three parameters depend on the rate at which the force is applied. Strength, elasticity, energy absorption and the relationship between them, may be difficult if the force is applied very rapidly, when compared with the effects of the same force applied slowly during a certain period of time.

Athletic Injuries

The situation in athletic injuries is similar. If a certain amount of kinetic energy is transferred into a bone or tendon or ligament or another structure, it is deformed and the energy is transformed into strain energy. The bone may bend a little, a ligament may stretch a little. If the material is strong enough to withstand the internal stresses the strain energy will be released again immediately. If not, it will break. The powerful release of energy at the moment when the material breaks may damage the surrounding tissues. Following a torsion fracture of the tibia, for instance, bone fragments may be thrown into the surrounding muscles and cause bleeding.

The Strength of Healing Wounds and Injuries

Engineering studies of the healing process should be of particular interest to athletic trainers. Most experiments have been carried out using the skin, usually of rats. A standarized cut is produced and the healing process is studied under standardized conditions. The biochemical composition of the healing tissue has been studied sequentially. In other experiments the mechanical properties have been measured repeatedly during the healing process.

Early experiments demonstrated a gradual build-up of collagen in the healing wound during the first three weeks after the cut was placed. Collagen tissue which provides strength. This does not indicate, however, that the healing would has regained its strength during the three week period. In fact, it may take a year or longer until the healing wound is as strong as the skin in the same area. Further experiments have shown that during the firs three weeks the building blocks are deposited in the wounded area, and during the next year a massive rebuilding of the connective tissue takes place. The connective tissue and the collagen are remodeled according to the stresses and strains to which the tissue is exposed. During the remodeling process the tensile strength gradually increases. A similar situation has been observed in healing bones.

There are no methods known at present which would reliably speed up the healing process. Intuitively one suspects that immobilization retards healing since the remodeling is stimulated by stresses and strains. Experimental evidence indicates that continuous passive motion improves the healing of defects in cartilage. Similar data for other tissues are not available. Again intuitively, one suspects that the motions should be rather gentle. During remodeling the tissues are not strong and it might be easy to cause further injury. These may be important exceptions. For instance, no healing can take place without an adequate blood supply. For the ingrowth of blood vessels into the injured area a period of rest may be necessary.

When can the athlete be allowed to return to full activity? If he does not wait unitl tissue strength is restored 100 percent after an injury he should review the necessary consequences and not risk a repeated injury by exposing the healing tissue to a force it cannot withstand. With the present state of knowledge it is difficult to give ntaional practical advice in this regard. However, another thing has to be kept in mind: the whole musculo-skeletal system must be considered, not only the healing part. Many athletic activities expose the musculo-skeeltal system to forces of a magniture which is sufficient to break bones in a testing machine. For instance the kinetic energy a high jumper develops is sufficient to break a tibia, yet fractures are very rare under these circumstances. A large part of the kinetic energy is taken up by the muscles which break the bending of the knees, hips and spine. Another portion is absorbed by ligaments, tendons and cartilage. Only a small portion of the energy is taken up by the bones. An athlete who has had his leg in a cast should not do high jumps immediately even if the fracture has healed and the bone has regained its original strength. The rest of the functional units, muscles, ligaments and so forth may not be strong enough or coordinated enough to absorb the energy. Under these circumstances a much larger portion of the energy is transferred to the bone, perhaps causing another fracture.

Conclusion

Engineering analysis of this type of event is only beginning. The analysis is of value not only in the assessment of the function of healing tissue, but, perhaps more importantly, the assessment of normal function and the limits thereof. When the forces causing trauma are known it might be possible to prevent trauma, either by avoiding or changing the forces , or by constructing well engineered - and practical - protective devices.

Unfortunately, too little is known about the mechanical behavior of various tissues to be of much help with practical problems at the present time. In fact, a word of caution is in order. There is a general lack of quantitative data on mechanical functions of the human body. There are important differences between various tissues and between various locations of the same tissues. The application of data obtained in one part of the body to another and the extra-polation from animal experiments is always risky and may lead to wrong conclusions. Animal experiments are difficult and must be very carefully controlled.

The assessment of the materials' properties during the healing period after an injury is complicated by the fact that the three parameters (strength, elasticity, energy absorption) are restored at different rates. The ability to absorb energy often is the last one to return to normal.

There is a great deal of interest in biomechanical studies, and the problems are attacked from many angles. The number of publications are increasing. It is hoped that everybody interested in sports medicine will attempt to build this new knowledge into his daily work for the benefit of the health of the athletes who are entrusted to their care and supervision.

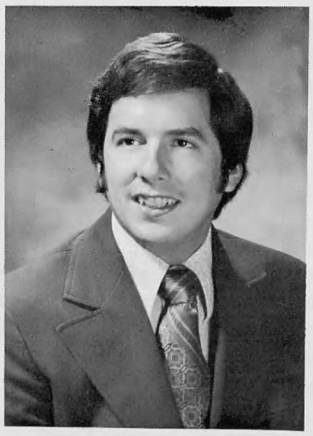
REFERENCES

1. Gordon, J.E.: *The New Science of Strong Materials or Why You Don't Fall Through the Floor.* Penguin Books, 1971.

SUGGESTED ADDITIONAL READING

1. Van Winkle, W. Jr. "The Tensile Strength of Wounds and Factors That Influence It." *Surg. Gynecol. Obstet.* 129: 819-842, 1969.
2. Zingg, W. "Bioengineering Analysis of Healing Tissues." *J. Sports Medicine* 3: 1975.

EDITOR'S COMMENTS



SCHERING SYMPOSIUM

As you will recall during the 1974 NATA Convention, the Schering Corporation sponsored the Schering Symposium on the foot and ankle. Four physicians, familiar to all of us, made up the panel for the presentation. They were: Moderator Dr. Robert Mack, Dr. James Garrick, Dr. James Sammarco, and Dr. Joseph Torg.

After much time and effort by all people concerned we are proud to present six papers taken from the Symposium in this issue. Speaking for the NATA, I would like to thank the fine panel and the Schering Corporation for their contributions. We look forward to the 1975 Schering Symposium in Anahiem.

JOURNAL DEADLINES

In order to keep the Journal coming out on time with all the pertinent information the deadlines for materials must be strictly enforced. Any announcements, letters to the editor, points of interest, etc. must be sent in by the following deadlines:

Issue	Due Date
March	February 1
June	April 15
September	August 1
December	November 1

Send the information to the following address:
Rod Compton
Athletic Training
Sports Medicine Division
East Carolina University
Greenville, NC 27834

THANKS TOM

Tom Carter, assistant trainer at the University of Wisconsin (Madison), is leaving the athletic training profession. Tom has been in charge of the journal's "Abstracts" section. Tom will be missed greatly by the journal committee. We wish him well in his new work and thank him for all his efforts.

DON'T LET "THE MINUTES" PASS YOU BY

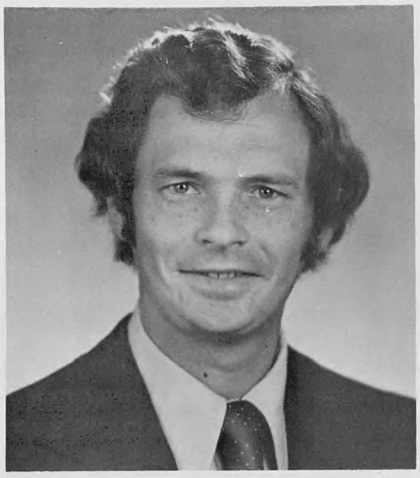
The minutes of the January 1975 Board of Directors meeting appears in this issue. Every member should read this section and keep up to date with, if not react to, the latest endeavors of our professional organization. Information on several controversial issues, such as Olympic Selection of Trainers and Continuing Education are included in the minutes.

One item that should be of immediate interest to student trainers is the addition of two new requirements for certification. Now you must have had an American Red Cross basic first aid course and current certification by the American Heart Association in cardiopulmonary recuscitation to be eligible to take the certification examination. Obviously information such as this is quite valuable to those concerned. Please read the minutes. By the way, the minutes are in small type to conserve space and expense.

Hope to see you at Anaheim along with Otho, Frank, Clint, Donald (Duck), and good ole Mickey!

Rod Compton
Editor-in-Chief

Evaluation of a Year-Round Football Conditioning Program



Robert J. Robertson, Ph. D.

Robert J. Robertson, Ph.D., Director
Physical Fitness Research Laboratory
Nebraska Center for Health Education
University of Nebraska - Lincoln

Boyd D. Epley, M.Ed.
Weight Training Coach
Department of Intercollegiate Athletics
University of Nebraska - Lincoln

Kenneth D. Rose, M.D.
Consulting Physician
Physical Fitness Research Laboratory
Nebraska Center for Health Education
University of Nebraska - Lincoln

Ford M. Royer, B.S., MT, [ASCP]
Medical Technologist
Physical Fitness Researach Laboratory
Nebraska Center for Health Education
University of Nebraska - Lincoln

George F. Sullivan, M.A., ATC, RPT
Therapist - Trainer
Department of Intercollegiate Athletics
University of Nebraska - Lincoln

Paul J. Schneider, B.S., ATC
Head Athletic Trainer
Department of Intercollegiate Athletics
University of Nebraska - Lincoln

INTRODUCTION

The preparation of an athlete for participation in a sport such as football requires that attention be given to the enhancement of both physical condition and performance skill. Of these two training objectives the development of skill is usually the more time consuming. Ideally then, physical conditioning should take the shortest possible time, should be maintained without decrement during the active season of the sport, and should not allow significant deterioration during the off-season such that return to peak efficiency would require a minimum of time and effort. Year-round physical conditioning appears to provide a

means whereby such ideal training objectives can be met.

In recent years the concept of year-round conditioning for football has gained acceptance by many colleges and universities. While the structure of such conditioning programs varies with available training facilities and coaching philosophy, many programs are based on the DEVELOPMENT-REFINEMENT-MAINTENANCE (DRM) concept. That is, a year-round program can be divided into the off-season or *developmental* stage, the pre-season or *refinement* stage and the in-season or *maintenance* stage (Figure 1).

During the off-season, which by most definitions includes winter conditioning, spring football and the summer vacation period, the development of overall physical fitness is usually stressed. Late summer and early fall typically comprise the pre-season training period. During this time the conditioning base already established in the off-season is refined and physical performance capacity is brought close to its competitive "peak." During the in-season or period of actual competition the primary training emphasis is on improvement of performance skills. Conditioning activities employed during this phase of the program are primarily intended to maintain the fitness improvements made during the off- and pre-season periods, thus providing a solid basis for skill development and injury prevention.

Since 1968 the Unviersity of Nebraska has regularly included voluntary year-round physical conditioning as part of its football program. While an empirical examination of the program's effectiveness indicated that it was successful, more definitive physiological support for its validity appeared warranted. As such, it was the purpose of this study to determine what changes in physical fitness occur during the off-, pre-, and in-season training periods of the University of Nebraska's year-round football conditioning program.

PROCEDURES

Twenty members of the 1972-73 University of Nebraska football team participated in this investigation. The players ranged in age from 18 to 20 years and were academically ranked as sophomores. All had at least two years of playing eligibility remaining at the time of the study. Relatively inexperienced players were chosen in anticipation that their limited exposure to systematic year-round conditioning would maximize the effect of the training program. Twelve were classified as running backs or ends and eight as interior linemen or linebackers. Positions were determined by the position played during the preceding season.

Fluctuations in physical fitness were measured at six different times during an eleven month period. The first battery of tests was administered in January just prior to the start o winter conditioning. The second test ing session took place in late March immediately following completion ol the winter program and just prior to the start of spring training. Session three was administered in early May at the conclusion of spring football and marked the beginning of the summer off-season program. Testing session four was administered in late August when the players reported for fall football camp and marked the end of the summer training period. Session five was administered in early September, immediately following fall camp and just preceding the start of the competitive season. The sixth and final testing session took place in November, at the completion of regular season play.

Successful performance in intercollegiate football depends to a large extent on high levels of strength, muscle mass, speed and motor ability, and at least moderate levels of anaerobic power and cardiovascular endurance (2, 4, 6). The physical fitness tests used in this investigation were intended to reflect these essential physical attributes. All "movement" tests were conducted on a Monsanto (Astroturf) artificial surface. Except where noted, motor fitness and strength tests were administered according to the procedures of Fleishman (3).

Upper body dynamic strength was tested with the bench press. The weight pressed was equivalent to 75 percent of the body weight recorded for each player at the first testing session. Dynamic leg strength was measured by a jump reach test. The difference between the standing arm reach and the point of highest jumping reach was taken as the score. Dynamic flexibility and speed of limb movement were measured with a 100 yard (5 X 20 yard) shuttle run. Anaerobic power was used as a measure of the body's ability to provide energy for maximum power output during the first four to five seconds of muscular effort. Power was measured by the Margaria test of maximum vertical velocity and expressed in horse power generated (5). A 1.5 mile run was used as a field performance test of cardio-vascular fitness. The percent of fat and lean tissue that comprised each player's total body weight was used as an indirect measure of muscle mass. Percent body fat was predicted from three skinfold measurements and calculated according to the formula of Pascale (7).

The following is a summary of the University of Nebraska's year-round

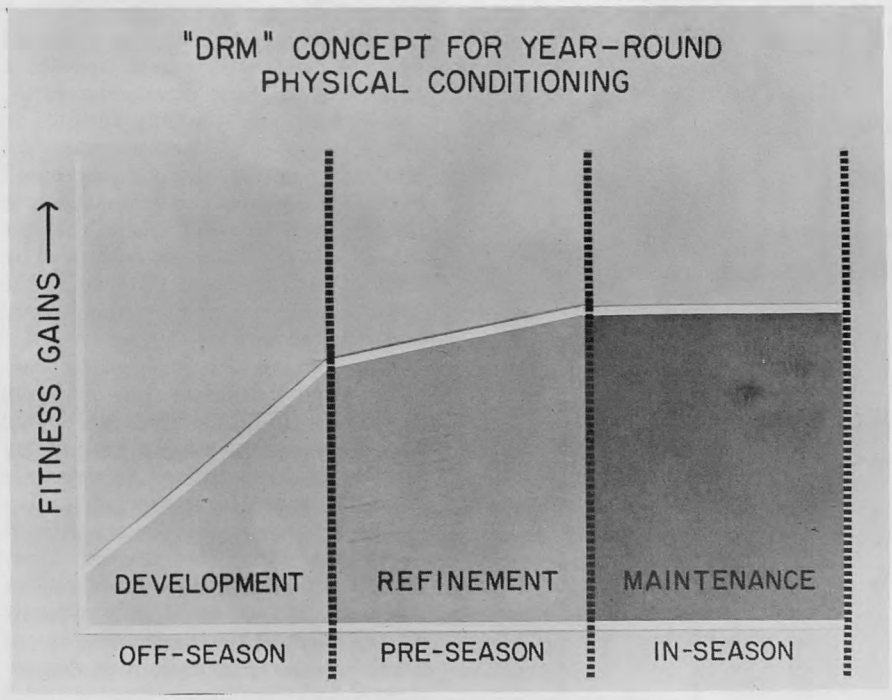


Figure 1

Continued on next page

football conditioning program. Specific conditioning activities are presented in the text while the conditioning objectives are listed in Table 1.

Winter Conditioning: An elective physical education class in Principles of Athletic Conditioning served as the basis of the winter training program. Conditioning drills were held on Monday, Wednesday and Friday of each week during the six week winter period. The conditioning circuit used was comprised of eight, five minute stations and included the following activities; (1) flexibility, agility and mobility drills, (2) sprints and quickness drills, (3) endurance running and (4) weight training, rope pulling and combative strength drills.

Spring Training: Spring football practice averaged four days per week during the four week (20 practice sessions) period allotted by the NCAA. Game skills, playing technique and a weekly scrimmage received the primary emphasis during this period. Calesthenics, sprinting, agility and flexibility drills were included in each practice session and a twelve station weight training circuit was administered twice per week on off-practice days.

Summer Conditioning: An eight-step conditioning program was followed on a six day per week basis during the 14 week summer period. Daily conditioning activities included stretching, flexibility, agility and position skill drills. Weight training and endurance running were each undertaken three days per week on alternate days.

Pre-Season Conditioning: During the two week fall training period, practice sessions were held twice per day, six days per week. The primary emphasis was on preparation for the upcoming competitive season and, as such, a major portion of practice time was given to refining playing skills and learning game strategies. Included in each practice session were stretching, flexibility, agility, quickness, and sprinting drills. Heavy calesthenics requiring each player to move his own body weight and/or the weight of a partner provided the only weight training during this period.

In-Season Conditioning: During the 12 week competitive season practice sessions were held once per day, five days per week. Game preparation understandably occupied a substantial portion of each practice session. In-season physical conditioning consisted of daily stretching, flexibility, agility and sprinting drills. A twelve station weight training circuit was undertaken only on Monday and Wednesday of each week in order to provide a two day rest prior to the Saturday contest.

Comparisons of physical fitness changes over the six testing periods were accomplished by a one-way repeated measures analysis of variance and a Duncan Multiple Range Test for differences between pairs of fitness score. Statistically significant differences were accepted at the .05 level of confidence. Because of the high incidence of incapacitating injury in intercollegiate football, the number of subjects participating in each testing session fluctuated. In those instances where a player was not physically able to undertake a given test his score was taken as the average score for all participating players on that test for that particular session. Statistical results should be interpreted with this design limitation in mind.

RESULTS

Presented in Table 2 are the mean scores and analysis of variance calculations for each fitness measurement at the six testing sessions. The Duncan Multiple Range analysis indicated that bench press scores improved significantly over the winter conditioning period, remained constant through spring football drills, summer conditioning and fall camp, and then again increased significantly over the competitive season. On the other hand, jump reach scores did not change significantly at any individual testing session. Shuttle run scores improved significantly over winter conditioning and then remained constant for the duration of the year-long program. Scores for the test of anaerobic power significantly improved during winter conditioning and then remained stable until the competitive season where a significant decrease was observed. One and one-half mile run times remained stable from the winter through the summer conditioning periods, whereupon they significantly increased over fall camp and then significantly decreased during the competitive season. Percent body fat measures were unaltered during winter conditioning. They then significantly decreased during spring, increased during summer and decreased again during fall and finally remained constant over the competitive season. Total body weight did not change over the year-long period.

As had been anticipated upper body dynamic strength, flexibility, speed of limb movement and anaerobic power improved at various stages during the off-season (winter, spring and summer) period. While improvements were not observed in lower body dynamic strength and cardiovascular endurance the off-season conditioning activities were at least sufficient to prevent a decrement in these fitness measures. Muscle mass was the only variable to both increase and decrease over the off-season period, i.e., it increased during spring drills and decreased over the summer vacation. These changes in body composition were evidenced by fluctuations in percent body fat in the presence of a relatively constant total body weight.

During the fall pre-season conditioning period muscle mass increased to a level similar to that which had been previously attained during spring practice. In addition, dynamic strength, anaerobic power, flexibility and speed were all maintained without decrement during this period. However, the conditioning program was not adequate to sustain the previously established off-season levels of cardiovascular fitness as was demonstrated by a significant increase in 1.5

Continued on page 41

TABLE 1

Year-Round Conditioning Objectives

D - Develop R - Refine M - Maintain * - Not Emphasized ✓ - Injury Rehabilitation	Physical Fitness Components							
Conditioning Period	Muscular Strength	Muscular Endurance	Muscle Mass	Motor Ability	Anaerobic Power	Cardiovascular Endurance	Game Fundamentals	Injury Rehabilitation
Off-Season								
Winter	D	D	D	D	D	D	*	✓
Spring	*	M	*	D	M	*	D	*
Summer	D	D	R	D	M	D	*	✓
Pre-Season (Fall Camp)	R	R	M	R	R	M	D	*
In-Season (Competition)	M	M	M	M	M	M	D	✓

HOT – COLD 'n SOOTHING

3 new products relieve minor pain and discomfort.

J&J Athletic Heat Balm
Smooth on this deep-penetrating, longer-lasting heat balm for relief of minor aches and muscle soreness. You'll find that it vanishes with massage and is both greaseless and stainless.

J&J Instant Reuseable Cold Pack
Instant cold is yours with a simple squeeze of the bag, and there's no need to discard it after first application. Just place pack in the freezer compartment for multiple re-use as a cold compress. Foam insulator on one side better directs cold to the injured area and keeps pack colder longer.

J&J Athletic Powder
This effective, finely textured, all-purpose powder helps prevent chafing, is cooling and helps absorb excess moisture. You'll like the unique refillable shaker and the economical bulk put-up.

Player protection begins with

J&J Johnson & Johnson
ATHLETIC DIVISION
New Brunswick, New Jersey 08903

mile run times following fall camp.

Contrary to expectations upper body strength and cardiovascular endurance increased during the course of the competitive season and anaerobic power declined. As had been anticipated lower body strength, flexibility, speed and muscle mass were maintained without decrement during the competitive season.

It is also of note that when the results of the final testing session were compared with those of the first, significant improvements were seen in the bench press, jump reach, anaerobic power and percent body fat tests. Apparently while gains in upper and lower body strength, power and muscle mass were not consistently observed at each testing point, the accumulated year-long improvement in these variables was significant.

DISCUSSION

The year-round football conditioning program employed by the University of Nebraska generally conformed to the DRM concept of developing physical fitness during the off-season, refining selected areas of fitness during the pre-season and maintaining fitness during the in-season period. Several notable exeptions were evident however.

Improvements were not seen in either lower body strength or muscle mass during the off-season winter conditioning program. Since weight training for muscular strength and hypertrophy is one of the primary emphases of winter conditioning, the Nebraska program would appear deficient in developing these attributes. The absence of leg strength improvements may have resulted from the common practice of using higher lifting repetitions with leg than arm exercises when the enhancement of strength is the primary objective of a weight training program. The higher leg repetitions might then have caused a relatively heavier emphasis on the development of muscular endurance as opposed to strength in the lower body. An examination of the Nebraska weight training program confirmed that higher lifting repetitions were used with the leg than the arm exercises and, therefore, at least partially accounted for the absence of leg strength gains.

Because gains in strength usually precede improvements in anaerobic power, it is also interesting to note that anaerobic power increased over the winter program even in the absence of leg strength improvement. The heavy training emphasis on sprinting and quickness drills may have accounted for this inconsistency.

Improvements in overall conditioning were not noted during spring football practice. Since the majority of spring practice time was given to the development of game skills and playing technique, these findings were not unexpected. The fact that decreases in fitness did not occur during this training period indicates that the spring conditioning program offered an effective balance between the maintenance of physical condition and the enhancement of game skills.

The decrease in muscle mass over the summer conditioning program was likely caused by the somewhat irregular weight training regime and the less rigid dietary patterns that are typical of vacation periods away from a controlled training environment. However, the lack of improvement in cardiovascular endurance over the summer vacation is not as easily explained. It was assumed weight training facilities would not be available to many of the players over the summer months. Consequently, such endurance-oriented activities as running, basketball, and handball were used as the primary training components of the summer conditioning program. While a decrement in cardiovascular endurance was not observed, it was apparent that adherance to the program was not sufficient to produce the desired off-season increases in endurance capacity. This observation is of some significance since the off-season summer period is the point in a year-round conditioning program where maximum developments in cardiovascular endurance are expected to occur.

A general comment appears in order with respect to the level of cardiovascular endurance of the team. Maximal oxygen uptake was predicted at each testing period using the Astrand nomogram and sub-maximal cycle ergometer heart rate responses (1). The average maximal oxygen uptake level for the six testing sessions was predicted at 42 ml/kg/min. This finding indicates that the aerobic capacity of the Nebraska players was

TABLE 2

Means ($\bar{X}$) and Standard Deviations (SD) of Physical Fitness Scores and Anthropometric Measurements for the Six Testing Sessions

		Testing Session					
		1	2	3	4	5	6
Fitness Variable	F	$\bar{X}$ (SD)	$\bar{X}$ (SD)	$\bar{X}$ (SD)	$\bar{X}$ (SD)	$\bar{X}$ (SD)	$\bar{X}$ (SD)
Bench Press (reps)	7.22**	11.1 * (2.5)	13.6 (0.1)	13.7 (0.2)	13.4 (0.1)	13.9 * (0.4)	15.6 * (2.1)
Jump Reach (Δ inches)	3.03**	22.7 (0.7)	23.2 (0.1)	23.1 (0.2)	23.4 (0.1)	23.8 (0.1)	24.2 * (0.9)
Shuttle Run (sec.)	2.91**	20.96 * (0.36)	20.29 (0.31)	20.64 (0.04)	20.34 (0.26)	20.70 (0.10)	20.68 (0.08)
Anaerobic Power (Hp)	10.18**	1.74 * (0.16)	1.98 (0.07)	1.98 (0.07)	1.93 (0.02)	1.95 * (0.04)	1.87 * (0.04)
1.5 Mile Run (sec.)	4.25**	619.28 (5.20)	599.20 (14.87)	601.50 (12.57)	608.56 * (5.51)	638.84 * (24.77)	617.06 (2.99)
% Body Fat	7.42**	14.9 (0.1)	14.9 * (0.1)	13.9 * (0.1)	14.7 * (0.1)	13.2 (0.1)	13.6 * (0.1)
Body Weight (lb)	0.81	209.6 (1.9)	207.8 (0.1)	207.4 (0.2)	207.9 (0.2)	206.3 (1.4)	207.2 (0.5)
Height (in)	1.79	73.5 (0.1)	73.6 (0.0)	73.6 (0.0)	73.6 (0.0)	73.6 (0.0)	73.6 (0.0)

** Indicates a significant overall F at the .05 level.
* Indicates a significant difference between adjacent mean scores at the .05 level as determined by the Duncan Multiple Range analysis.

Sessions: 1 - Start Winter Conditioning
2 - End Winter and Start Spring
3 - End Spring and Start Summer
4 - End Summer and Start Fall
5 - End Fall and Start Season
6 - End Season

low in comparison with other collegiate athletes (6). The fact that the oxygen uptake values were lower than those previously reported for high school, college and professional football players (4) would suggest that a disproportionate emphasis may have been placed on weight training and motor fitness at the expense of cardiovascular conditioning during the year-round program. While evidence of the influence of aerobic fitness on game skill performance is equivocal, the possibility still exists that higher levels of endurance may represent the "winning edge" in a particularly long and fatiguing fourth period of play.

The primary emphasis of the pre-season fall training period was on the refinement of playing skills and game strategies. Physical conditioning nevertheless played a significant role in team preparation and with the exception of a decrement in cardiovascular endurance, was sufficient to maintain the fitness improvements attained during the off-season. It is characteristic of some year-round training programs to carry over the emphasis on cardiovascular conditioning from the summer off-season to the fall pre-season period. In contrast, the Nebraska fall pre-season training regime did not include any aerobic conditioning. This omission likely accounted for the slower 1.5 mile run times at the conclusion of fall camp. Such a substantial loss of cardiovascular endurance over a comparatively short training period point to the need for aerobic conditioning during pre-season training.

It had been anticipated that overall fitness levels would remain constant during the competitive season. In fact, it is thought by some that fitness will actually decline during competition because of lost practice time due to injuries. It was, therefore, surprising that in-season improvements were seen in both upper body strength and cardiovascular endurance. While the in-season weight training circuit was followed only two days per week it was apparently of sufficient dosage to not only maintain but also to improve upper body strength. Formal in-season weight training has long been used for injury rehabilitation but its use as a conditioning tool during the competitive season has not met with universal acceptance. The fact that a high level of upper body strength is indispensible for most players and particularly for interior linemen and linebackers would appear to justify its twice weekly inclusion in an in-season conditioning program.

The improvement in cardiovascular endurance during the competitive season was also an unanticipated benefit of in-season conditioning. While a complete explanation of this improvement is unclear, periodic 1.5 mile runs and sporatic "Alpine" running of stadium steps may have at least partially contributed to the enhancement of endurance capacity.

On the other hand, anaerobic power decreased during the competitive season. This is in contract to the findings of Schreiber (8) who observed an increase in anaerobic power from 2.21 hp to 2.26 hp over the course of a football season. Since sprinting, quickness drills and weight training exercises employing explosive muscular contractions were an integral part of the in-season conditioning program this result is difficult to explain. Quite possibly chronic but not totally incapacitating injury may have limited full participation in the high intensity, short duration explosive conditioning activities of the type that enhance anaerobic power.

SUMMARY AND CONCLUSIONS

The year-round football conditioning program examined in this investigation produced significant gains in strength, anaerobic power, flexibility, speed of movement and muscle mass at various stages during the off-, pre-, and in-season training periods. Improvements, while limited in magnitude and frequency of occurance, were also seen in cardiovascular endurance. The year-trend in fitness improvement generally conformed to the DRM conditioning concept.

Of particular importance was the observation that as team preparation progressed through the various year-round conditioning periods very few decreases in fitness occurred once improvements had taken place. Thus a solid conditioning base was carried from one training period to the next and ultimately into the competitive season. Because the maintenance of previously established levels of physical fitness requires less training effort than is required to improve fitness, it was then possible to spend more time on game preparation and less on physical conditioning during the competitive season. However, the results of this investigation did emphasize that in order to maintain fitness throughout the in-season period supplementary weight training, calesthenic and cardiovascular endurance activities must also be included in team preparation. Such an in-season conditioning program, while maintaining strength and cardiovascular endurance, will simultaneously provide a sound basis for skill development and quite possibly offer a significant deterent to injury.

RECOMMENDATIONS

The findings of this investigation appear to warrant the following recommendations with regard to the year-round football conditioning program studied. It is recommended that:

1. An increased emphasis be used on the use of weight training for the development of leg strength during the winter conditioning period.
2. Aerobic conditioning, weight training and dietary programs should be more closely supervised during the summer vacation period in order to enhance cardiovascular endurance, muscular strength and muscle mass.
3. Aerobic conditioning activities should be taken daily during the pre-season fall training period and in general should be followed a minimum of three times per week during the off- and in-season phases of the year-round program.
4. Participation in high intensity explosive leg exercises of the type that enhance anaerobic power should be undertaken during the competitive season.

This study was supported in part by a grant from the Committee on the Competitive Safeguards and Medical Aspects of Sports of the National Collegiate Athletic Association.

REFERENCES

1. Astrand, P.O., and Rodahl, K., *Textbook of Work Physiology* McGraw-Hill Book Co. Inc., New York, New York, 1970.
2. Costill, D.L.; Hoffman, W.M.; Kehoe, F.; Miller, S.J. and Myers, W.C., "Maximum Anaerobic Power Among College Football Players," *The Journal of Sports Medicine and Physical Fitness*, Vol. 8. June 1968.
3. Fleishman, E.A., *The Structure and Measurement of Physical Fitness*, Prentice-Hall, Inc.: Englewood Cliffs, N.J., 1964.
4. Kollias, J.; Buskirk, E.R.; Howley, E.T. and Loomis, J.L., "Cardiorespiratory and Body Composition Measurements of a Select Group of High School Football Players," *The Research Quarterly*, Vol. 43, No. 4, 1972.
5. Margaria, R.; Aghemo, P. and Rovelli, E., "Measurement of Muscular Power (Anaerobic) in Man," *Journal of Applied Phsiology*, Vol. 21, Nov. 1966.
6. Novak, L.P.; Hyatt, R.E. and Alexander, J.F., "Body Composition and Physiologic Function of Athletes," *Journal of the American Medical Association*. Vol. 205, No. 11, Sept., 1968.
7. Pascale, L.R.; Grossman, M.I.; Sloane, H.S. and Frankel, T., "Correlations Between Thickness and Skinfolds and Body Denisty in 88 Soldiers," *Human Biology*, Vol. 28, May, 1956.
8. Schreiber, M.L., "Anaerobic Capacity as a Function of Somatotype and Participation in Varsity Athletics," *The Resarch Quarterly*, Vol. 44, No. 2, 1973.

See Ya' at

NATA Convention

ALL ABOARD: Engineer Mickey Mouse prepares to depart Main Street Station in one of five trains that make up the Santa Fe and Disneyland Railroad. The trains take guests on a journey around the perimeter of the Park with visits to the exciting Grand Canyon and Primeval World dioramas.

"QUEEN OF THE RIVER": In Frontierland at Disneyland is the majestic Sternwheel riverboat, the Mark Twain. The triple-deck vessel, first steamboat of its kind built in America in more than 50 years, sails past Indian villages, Fort Wilderness and Nature's Wonderland during its Frontierland voyage. At the extreme left can be seen the Haunted Mansion.

The Marina Tower where N.A.T.A. members will register. Convention Center (not shown) is to the right of this tower.

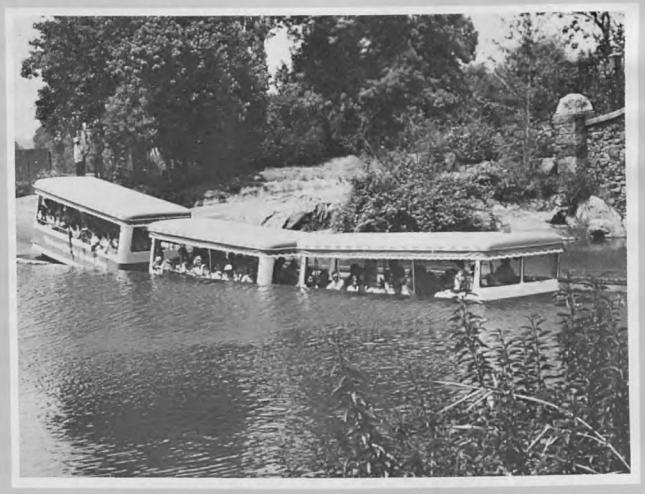
GHOSTS WELCOME: Disneyland's "Haunted Mansion" is inhabited with 999 ghosts, goblins and ghouls of every description. The stately looking mansion is furnished with cobwebs, creaking doors and even a murkey graveyard-just the kind of unearthly atmosphere that high spirited ghosts, NATA members, and their families can enjoy. NATA day at Disneyland will be June 8th.

THE SIERRA TOWER, the Disneyland Hotel's original landmark structure, is home of the Top of the Park cocktail lounge, reached via the "Looking Glass" elevator running up the outside of the building.

Anaheim!

June 7 - 11, 1975

MARINA AT NIGHT: Masts of boats in the Disneyland Hotel Marina are etched against the new 11-story Marina Guest Tower. Popular resort hotel now has 1,000 rooms.



Tour guests thrill to the special effect "Parting of the Red Sea," one of many exciting experiences on the Universal Studio Tour.

Disneyland Monorail at the hotel station. In the background is the Sierra Tower.

The Ghost Town and Callico Railway is one of the most treasured heirlooms at Knott's Berry Farm. Built in 1881, it is the only narrow-guage passenger train in America operating on a daily year-round schedule. The first train that dared to go through the tortuous chasms of the Rockies and not around them, it was brought to Ghost Town in 1952 from its old route with the Denver and Rio Grande in Colorado. Its present daily journey is still fraught with danger as masked bandits have been known to burst through the cars in daring holdup attempts. Knott's Berry Farm is located on Beach Boulevard in Buena Park, just two miles south of the Santa Ana Freeway.

An entire hillside begins to crumble. The earth shakes and roars. Suddenly 600 boulders careen toward your tram. The giant rockslide is one of the newest and most thrilling special effects you'll see on the Universal Studios Tour. The boulders are styrofoam, but the terror is real.

ANNOUNCEMENTS

CERTIFICATION INFORMATION

Persons wishing to be certified as an Athletic Trainer by the NATA must fully qualify under the Procedures for Certification prior to taking the Certification Examination.

The examination is given four times yearly. It is administered one day prior to the annual convention in June at the convention site, the third Sunday of January (on a regional basis), the second Sunday of March (on a regional basis), and in early August, should a sufficient need exist at a central site for overflow applications processed at the same time as for the annual convention.

Persons desiring to take the examination may obtain application materials from NATA, 3315 South Street, Lafayette, Indiana, 47904, provided the individual meets the membership requirement. The application must be requested in writing ninety (90) days prior to the date of the examination. No applications will be furnished to the applicants less than sixty (60) days prior to the examination date in order to assure that the application deadline of six weeks prior to the examination may be met. If a late summer overflow site is scheduled, all applications must be processed with the same deadlines as for the June annual convention site.

If further information is required, contact Lindsy McLean, Chairman, NATA Board of Certification, 1000 S. State Street, Ann Arbor, Michigan, 48104.

N.A.T.A. CURRICULUM DEADLINES

All institutions desiring N.A.T.A. aproval of their curriculums must submit their applications to Sayers Miller at Pennsylvania State University, University Park, Pennsylvania prior to September 1st for the final action at the Board's Meeting in January and prior to February 1st for final action at the Annual Meeting. If applications are received after the above listed dates they will be carried over to the next evaluation period.

N.A.T.A. WORKSHOP APPROVAL

N.A.T.A. approved clinics and workshops will be listed in the **Athletic Training**. Application forms and guidelines for N.A.T.A. approval may be obtained from Sayers Miller, College of Health, Physical Education, and Recreation, 10 White Bldg., Pennsylvania State University, University park, Pa. All program approvals by N.A.T.A. are only on a year basis & all 1974 approved programs if offered in 1975 must seek reapproval.

Guide to Contributors

The editor of **Athletic Training**, the Journal of the National Athletic Trainers Association, welcomes the submission of articles 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 articles:

1. All manuscripts should be typewritten on one side of 8½ x 11 inch typing paper, triple-spaced with one inch margins.
2. Photographs should be glossy black and white prints. Graphs, charts, or figures should be clearly drawn on white paper with black ink, in a form which will be legible when reduced for publication.
3. The list of references should be as follows: a) books: author, title, publisher with city and state of publication, year; b) articles: family names and initials of all authors, title of authors, title of article, journal title (abbreviations accepted as per Index Medicus), volume, page, year.
4. It is the understanding of the editor of **Athletic Training** that manuscripts submitted will not have been published previously; and that the author accepts responsibility for any major corrections or alterations of the manuscript.
5. It is requested that each submitting author include with the manuscript a brief biographical sketch and photograph of himself in coat and tie.
6. For reprints, authors are authorized to reproduce their material for their own use or reprints can be reproduced at time of initial printing if the desired number of reprints is known.

Unused manuscripts will be returned, when accompanied by a stamped, self-addressed envelope.

Address all manuscripts to:

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

ANNOUNCEMENTS

NOCSAE FOOTBALL HELMET CERTIFICATION TEST RESULTS THROUGH APRIL 1, 1975

The following football helmets passed the NOCSAE Test Standard:

HELMET MANUFACTURER	STYLE NUMBER	YEAR
Athletic Repair and Manufacturing Company	VHP3	1975
	VH12	1975
	VHP12	1975
Bell Helmet, Incorporated	1975	1975
Gladiator Athletic, Inc.	GHH	1974
	G88	1974
	THH	1974
	G12	1974
	G44	1974
	G77	1974
	T44	1974
	DC	1975
Kendall Company	BIKE 5	1975
MacGregor - Dvision of Brunswick Corporation	100MH	1974
	100MH	1975
	120MH	1975
	130MH	1975
Marietta Manufacturing Company, Incorporated	K21	1974
	K112	1975
	K22	1975
	K21 Jr.	1975
Nocona Athletic Goods Company	N12-S	1975
	NHCS	1975
	LNHC-S	1975
	LNKC-S	1975
	NPJH	1975
	NKHC-S	1975
	NK12-S	1975
Protective Products - Division of Becton, Dickinson & Co.	A707	1975
	A747	1975
	P707	1975
	P747	1975
	P38	1975
	P5	1975
Rawlings Sporting Goods Co.	HND-9	1974
	HND-9	1975
	CSH	1974
	CSH	1975
	HC	1975
	HC-20	1975
	HC-30	1975
	CHND-9	1975
	CHC	1975
	CHC-20	1975
	HBZ-1	1975
	HBZC1	1975
	JRC	1975
	NBCZ-1	1975
Riddell, Incorporated	PAC-3	1975
	TAK-29	1974
	TK-2	Model manufactured since June 1, 1974
	HA-92	1975
	Ramrod I	1975
	Ramrod II	1975
	Micro-Fit	1975
Royal Athletics	King	1975
	Prince	1975
	Duke	1975
Southern Athletic Company	RD1	1975
	RD2	1975
	RDP	1975
	RDX	1975
Wilson Sporting Goods Co.	F2034	1974
	F2034	1975
	F2043	1974
	F2043	1975
	F2000	1975
	F2002	1975
	2002-FS	1975
	F2004	1975
	F2005	1975
	F2032	1975
	F2040	1975
	F2054	1975
	1962CL-WS	1975
	F2000	1974 (revised)

New!

NATA Patch - Emblem

for CERTIFIED ATHLETIC TRAINERS Only!

In Four Beautiful Colors —
Red, White, Yellow and Blue!

$ 2.00 Each

Use Handy Order Form Below!

Send Check or
Money Order to:

N.A.T.A.
3315 South Street
Lafayette, Indiana 47904

ORDER FORM

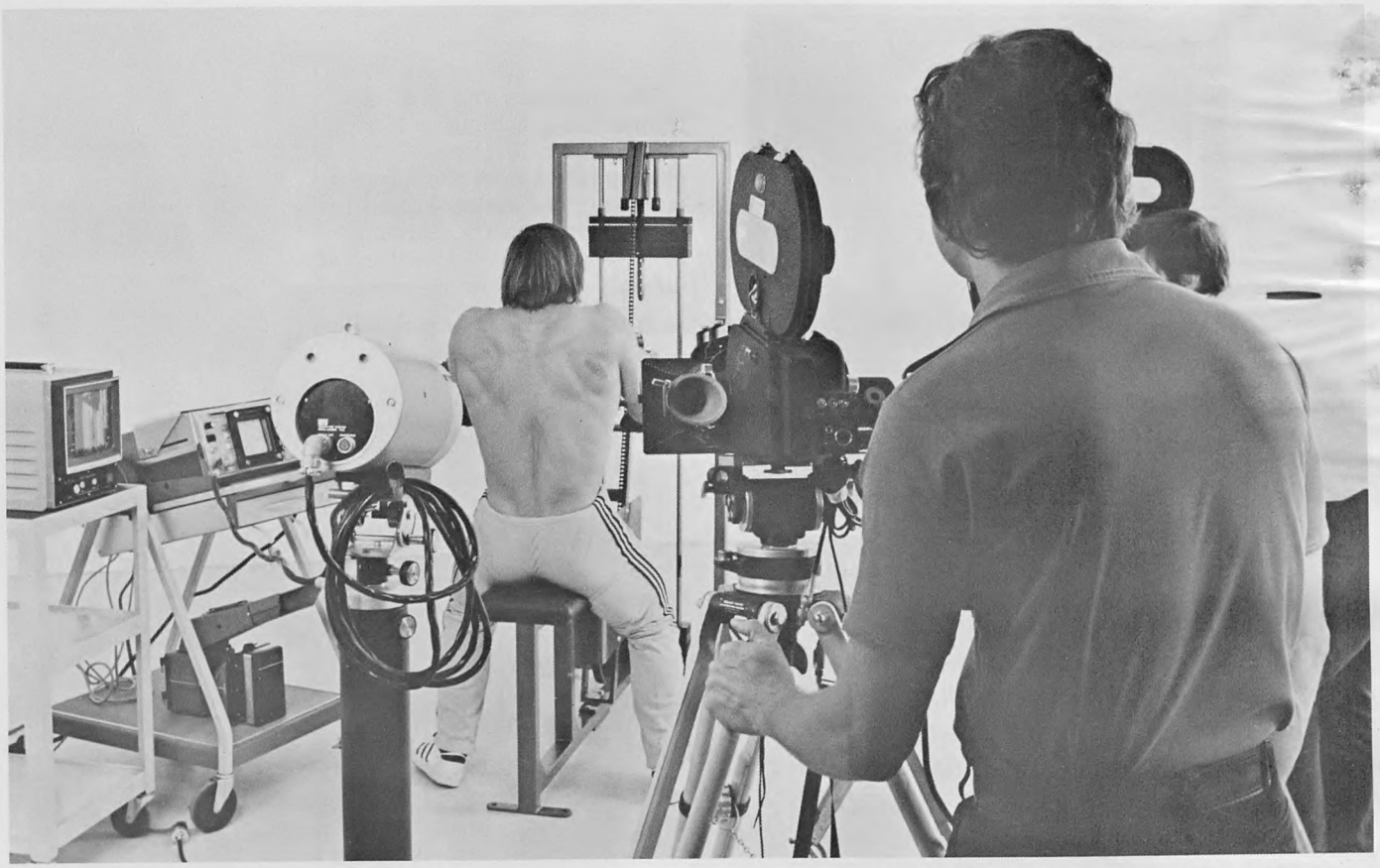
Please send me ____ N.A.T.A. Certified Athletic Trainer patch-emblems at $ 2.00 each. I enclose

$ _____.

Name _____ Certification No. _____

Address _____

City _____ State _____ Zip _____



Electronic Scanning Infrared Camera focused on the upper back of a trainee using a Nautilus Neck and Shoulder Machine.

A New Approach . . .

By Arthur Jones

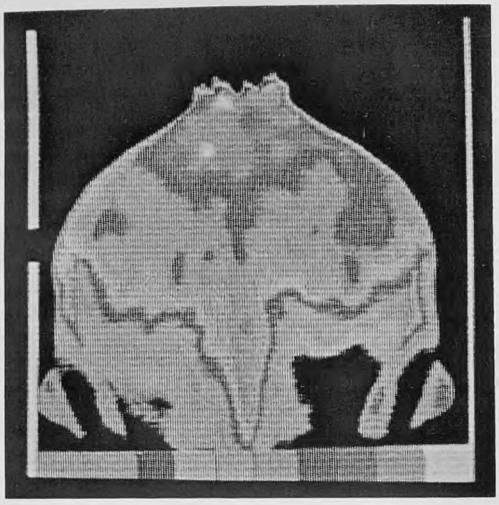
to the problem of

Neck Injuries In Sports

Injuries to the neck are the most common cause of death in football . . . but, until recently, no practical method of development existed for this important segment of the body. To the extent that the muscles and connective tissues of the neck and shoulders can protect the neck against injury, this problem has now been solved . . . in a simple, practical and realistic manner.

The muscles of the neck and shoulders are perhaps the easiest muscles in the body to develop . . . when they are provided with direct exercise; the problem has been that there was no practical method of providing such direct exercise. The exercises that have been available were clumsy, difficult to perform, uncomfortable, and sometimes even dangerous . . . in short, previously existing exercises for the neck were not practical; and, as a result, this important section of the body has been largely ignored.

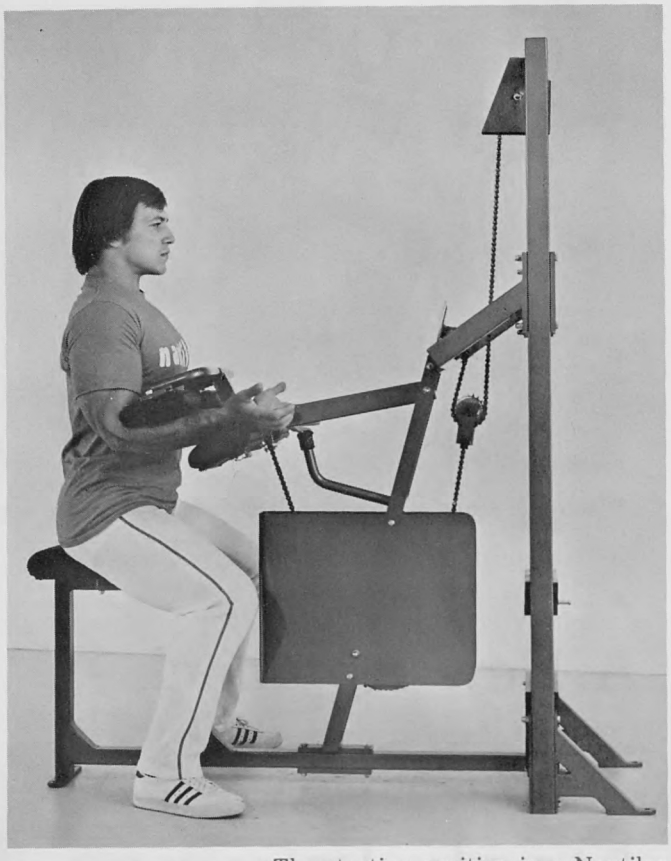
The muscles of the neck are capable of producing movement in seven different directions . . . (1) elevation of the shoulders (shrugging) . . . (2) flexion of the neck (bending the head down towards the chest) . . . (3) extension of the neck (extending the head) . . . (4) lateral contraction of the neck to the right (bending the head down towards the right shoulder) . . . (5) lateral contraction of the neck to the left . . . (6) rotation of the head to the right (twisting the head to look over the right shoulder) . . .



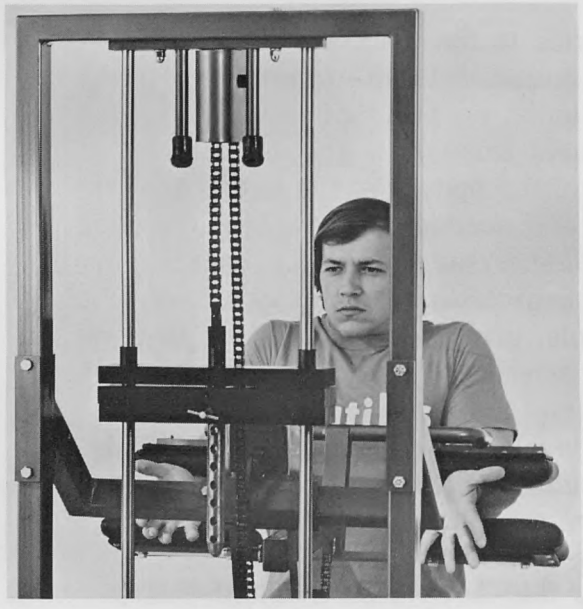
The shoulders and neck of a trainee using a Nautilus Neck and Shoulder Machine . . . as photographed from the infrared monitor. The darker areas in the upper portion of the anatomy indicate a higher temperature as a result of the working muscles.

and (7) rotation of the head to the left.

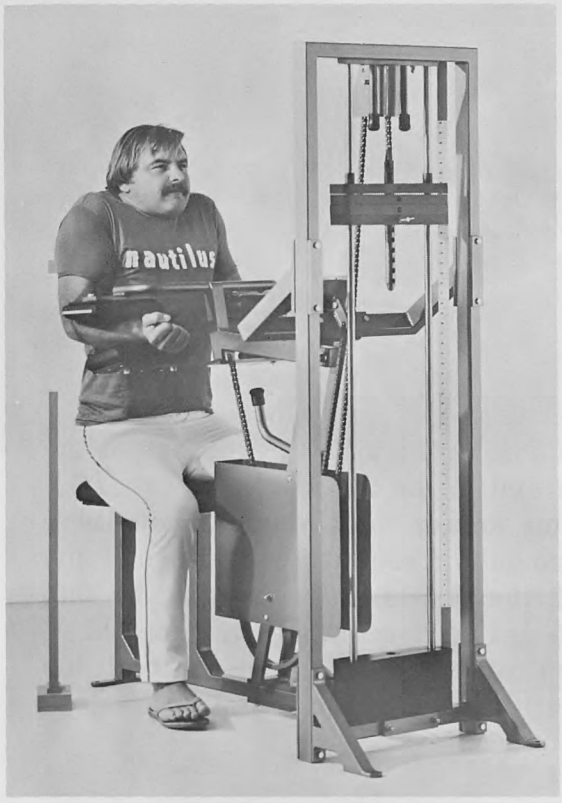
In order to provide the greatest possible degree of protection to the neck, all of these functions of the neck muscles must be provided with direct, full-range exercise. When such exercise is properly provided, the response of the neck muscles is immediate; probably because the muscles of the neck are exposed to so little in the way of hard work during the course of normal living, these muscles respond to exercise very rapidly. So proper development of the neck muscles is not a matter of years . . . instead, it is a matter of weeks; nor does it require long, frequent training sessions . . . in practice, less than twenty minutes of proper exercise performed over a period of a week is all that is required for full development of the muscles involved in all seven types of neck movement. Six weeks of such training, a total of approximately two hours of time devoted to proper neck exercises, will produce a marked increase in both the strength and size of the neck and shoulder muscles . . . greatly reducing the chance of injury.



The starting position in a Nautilus Neck and Shoulder Machine.



The Nautilus Neck and Shoulder Machine removes the requirement to maintain a grip on the bar. Four heavily padded supports are provided . . . two of which pads support the weight of the resistance on the surface of the upper forearms . . . and two of which pads prevent the arms from being straightened by the force of the resistance.



The **Nautilus Neck and Shoulder Machine** meets all of the requirements for providing an almost perfect form of exercise for several of the largest and strongest muscles of this important part of the body . . . while simultaneously removing all of the problems associated with barbell shrugs or other exercises for these same muscular structures.

Dick Butkus in the contracted position of the Neck and Shoulder Machine.

The Nautilus Neck and Shoulder Machine is priced at $885. f.o.b. DeLand, Florida or Independence, Virginia. Plus $45. for crating if the machine must be shipped by commercial truck line. Florida residents must add 4% state sales tax if ordering from the Florida plant, and Virginia residents must add the existing Virginia state sales tax if ordering from the Virginia plant. There is no charge for crating for machines picked up by customers at either plant . . . but in that case, all persons must pay the appropriate sales tax.

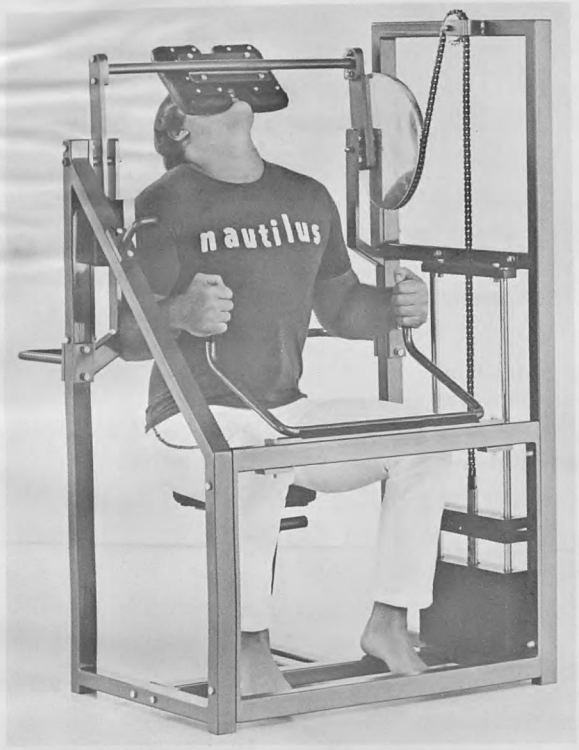
• • •

The **Nautilus 4-way, Direct Neck Machine** provides exercise for four of the seven basic movements possible for the neck . . . anterior flexion, posterior extension, and lateral flexion to both the right and left.

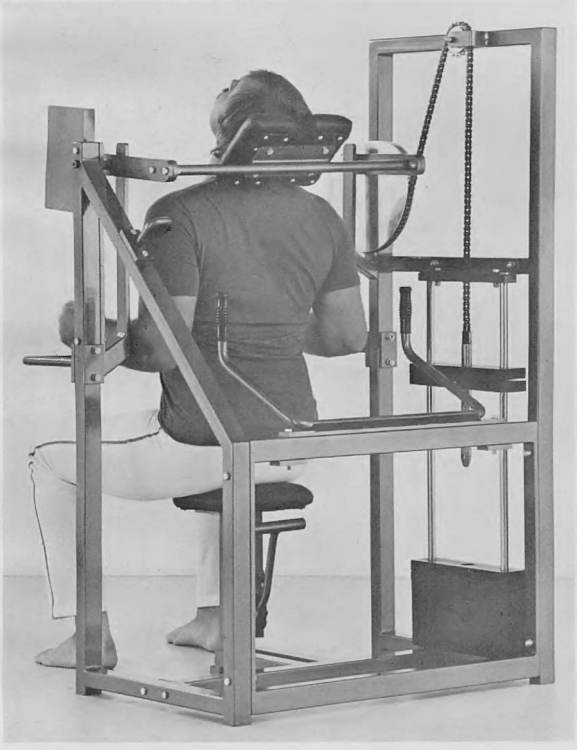
Proper utilization of this machine requires the performance of one set of approximately 12 repetitions of each of the four exercises, using as much resistance as possible while maintaining good form . . . moving fairly slowly during the positive (lifting) portions of the exercises, pausing briefly and holding the contracted positions, and slowly lowering the resistance during the negative portions of the movements.

Using a Nautilus 4-way, Direct Neck Machine, Dick Butkus demonstrates lateral flexion of the neck to the left.

Workouts should be performed three times weekly, and only one set of each exercise should be performed during each workout.



Anterior flexion



Posterior extension

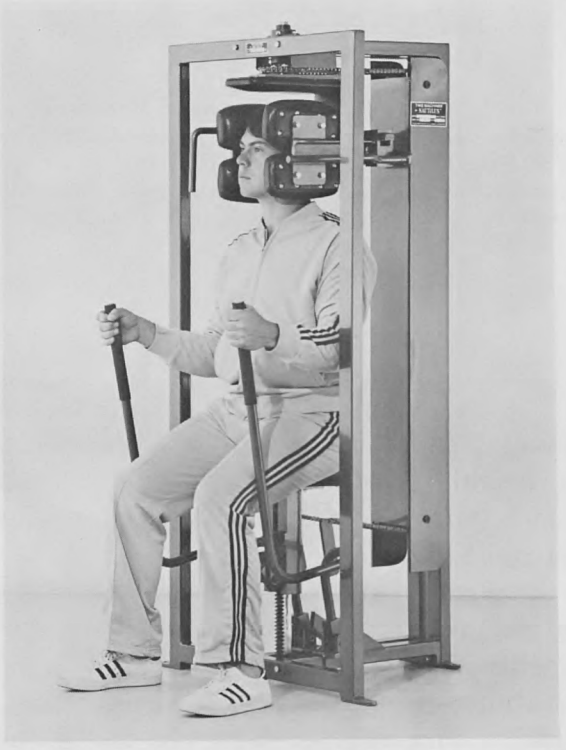
The Nautilus Neck and Shoulder Machine and the Nautilus 4-way, Direct Neck Machine provide proper exercise for five of the seven functions of the neck muscles.

The Nautilus 4-way, Direct Neck Machine is priced at $965. f.o.b. DeLand, Florida or Independence, Virginia. Plus $55. for crating if shipment must be made by commercial truck line.

• • •

The third type of Nautilus Neck machine completes the circuit, providing proper exercise for the final two functions of the neck . . . rotation of the neck to the right and to the left.

The **Nautilus Rotary Neck Machine** contains no weight stack, no built-in source of resistance of any kind . . . instead, the resistance is provided by the user, through the use of hand levers that enable you to exactly control the resistance during both the positive and negative parts of the two exercises.



Nautilus Rotary Neck Machine

Detailed pictures of this machine are available by contacting:

Nautilus | SPORTS / MEDICAL INDUSTRIES

P. O. BOX 1783 DELAND, FLORIDA 32720 PHONE 904 / 228-2884

Schering

Presents

The

'74 SYMPOSIUM

"Foot & Ankle Problems in Athletics"

Left to right: Schering's Larry Schmeidler, with James G. Garrick, M.D.; G. James Sammarco, M.D.; Joseph S. Torg, M.D.; and Robert P. Mack, M.D., Moderator.

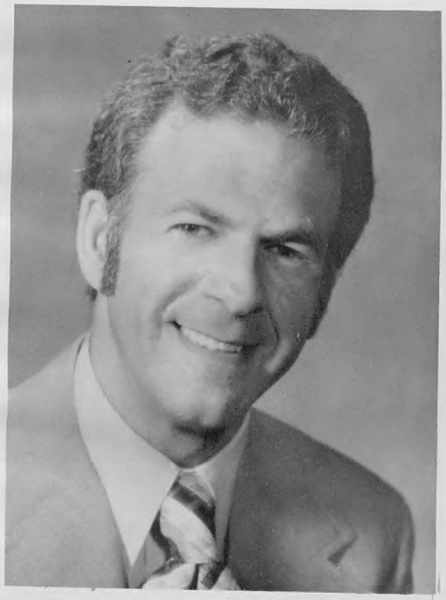
Edited by:

Glenn R. Knotts, Ph. D.
McGovern Allergy Clinic
6969 Brompton
Houston, Texas 77024

1974 SCHERING SYMPOSIUM

Ankle Injuries in Athletics

Robert P. Mack, M.D.



Robert P. Mack, M.D.

INTRODUCTION

I should like to review the problems of ankle injuries that are sustained by athletes. The incidence of ankle injuries is quite high, constituting 20-25 percent of all time-loss injuries in every running or jumping sport, including basketball, football, soccer, field hockey, and volleyball.

As we consider these, I should like to review the anatomy of the ankle joint, the mechanisms of injury, and the types of injuries that occur. I shall then discuss the concept of the stable vs. the unstable ankle and how to differentiate these two conditions. Finally, I hope to review briefly the treatment of ankle injuries an their rehabilitation.

ANATOMY

The ankle joint is formed by the tibia, fibula, and talus. The dome of the talus (trochlea) fits into a mortise formed by the tibia and fibula. The medial and lateral malleoli project downward to articulate with the sides of the trochlea (Fig. 1). The lateral malleolus projects down to the level of the subtalar joint considerably further than the medial malleolus and thus provides greater bony stability for the lateral side of the ankle joint. The ankle joint has a sophisticated motion in three dimensions that results in plantar-flexion, dorsiflexion of the foot. The trochlea is wider anteriorly than it is posteriorly because the lateral wall slopes outward instead of being parallel to the medial wall. The tibia portion of the joint is also wider anteriorly than posteriorly.When the foot is dorsiflexed, the wider anterior portion of the talus is brought into contact with the narrower position between the malleoli and therefore becomes gripped more tightly. As the ankle goes into plantar-flexion, the narrower posterior postion of the talus is brought into contact with the wider anterior portion of the tibia, which permits a small amount of free play in the ankle joint as the wedge effect noted in dorsiflexion is lost. The bony arrangement also helps to promote anterior stability of the ankle joint. As the tibia is driven forward on the plantar-flexed talus, the narrower part of the tibia impinges on the widened anterior portion of the talus blocking forward dislocation of the tibia on the talus.

The relationship of the tibia, talus, and fibula are maintained by three groups of ligaments. These are the deltoid ligament, the lateral collateral ligament, and the syndesmosis. The deltoid is considered the strongest of the three ligaments and is so by necessity because of decreased body protection medially. The deltoid ligament is a broad, triangular band that has four parts as defined by their bony insertions on the navicular, talus, and calcaneus. It is functionally divided into a deep and superficial portion. The deep portion attaches to the talus and is horizontal and therefore resists lateral displacement of the talus. If one makes coronal sections through the ankle joint, one can clearly see the vertical positions of the superficial portion and the horizontal position of the deep portion. Also, it can be seen that the deep portion is placed posteriorly.

The lateral collateral ligament of the ankle consists of three distinct parts. The posterior talo-fibular ligament arises from the posterior portion of the tip of the fibula and runs backward and slightly downward to attach to the lateral tubercle of the posterior process of the talus. This ligament is the strongest of the three and helps to resist forward dislocation of the leg on the foot. The calcaneo-fibular ligament is the largest of the three and passes inferiorly in a posterior direction to insert on the lateral surface of the calcaneus. When the foot is in plantar flexion, the calcaneo-fibular ligament is almost perpendicular to the axis of the fibula. This ligament is extracapsular, but is intimately associated with the personeal tendon sheath. On its lateral and dorsal aspects, the calcaneo-fibular ligament is covered for almost its entire length with the thin inner wall of the tendon sheath. This ligament is completely relaxed when the foot is in a normal standing position. It does not become taut until there is a strong supination movement of the calcaneus. The anterior talo-fibular ligament arises from the anterior border of the lateral malleolus and passes forward and somewhat medially to attach to the neck of the talus. Its direction corresponds to the longitudinal axis of the foot and is taut in all positions of flexion.

The syndesmosis is the ligament that maintains the relationship of the tibia and fibula, and consists of the anterior and posterior tibio-fibular ligaments and the interosseous membrane. The anterior and posterior tibio-fibular ligaments arise respectively from the anterior and posterior colliculi on the lateral side of the tibia. These ligaments actually hold the fibula snug in a groove on the tibia, where the fibula rotates about its vertical axis with dorsiflexion and plantar-flexion of the ankle. There is 3° of rotation of the fibula laterally with dorsiflexion and 3° medial rotation with plantar-flexion. These two ligaments blend into the interosseous membrane 2-3 cm. above the ankle joint.

There are important musculotendinous structures related to the deltoid and lateral collateral ligaments. Knowledge of these muscles is important for understanding methods of preventing ankle injuries as well as rehabilitating an athlete following an ankle injury. The medial stabilizers of the ankle are the posterior tibialis, the flexor digitorum communis and the flexor hallucis longus. These all originate from the posterior compartment of the leg and pass posterior and inferior to the medial malleolus. They are important for plantar-flexion and supination of the foot. The posterior tibialis muscle covers the posterior and middle parts of the deltoid ligament, and explains why this tendon is often trapped between the talus and medial malleolus and blocks reduction of deltoid ruptures. The lateral stabilizers of the ankle are the peroneal muscles which make up the lateral compartment of the leg. The peroneus brevis and longus prass distal and inferior to the lateral malleolus. The brevis inserts on the base of the 5th metatarsal; the longus passes under the cuboid bone in its own groove to insert on the inferior surface of the medial cuniform and base of the first metatarsal. As mentioned before, the peroneal tendon sheath covers the posterior and lateral portions of the calcaneo-fibular ligament. When this ligament is ruptured, the overlying inner wall of the peroneal tendon sheath is also torn because it lies adjacent to this ligament. Thus the peroneal tendon sheath would communicate with the ankle joint in such an injury. The peroneal tendons are important for pronating and everting the foot. Because of the intricate relationship of these muscles to the stabilizing ligaments of the ankle joint, they are capable of absorbing

stress and protecting these ligaments from injury.

MECHANISMS OF INJURY

When considering injuries to the ankle, one must consider the magnitude and direction of forces as they are applied to the ankle. In the sports requiring a cleated shoe, the foot is usually fixed to the ground and the body is rotating and angulating about it. Because inversion sprains are the most common, we can postulate that the anatomy and the activity of the running foot predisposes towards this injury. As mentioned before, bony stability is greater laterally than medially, thereby predisposing towards inversion rather than eversion. Once inversion is initiated, the ankle loses the bony stability it enjoyed in the neutral position. As inversion increases, the medial malleolus may lose its stabilizing function and actually set as a fulcrum for further inversion. If the everting muscles (peroneals) are not strong enough, the tensile strength of the lateral ligaments may be exceeded, resulting in injury.

The way an athlete uses his ankle may also predispose to inversion injuries. A cutting or turning maneuver, often the initiating factor in these injuries, involves pushing off to the side from the opposite lead foot. For example, to cut to the left, the direction change is initiated off the fixed right foot, inverting the ankle and externally rotating and plantar-flexing the right foot. The opposite mechanism of injury may occur although statistically this is far less likely. An eversion, external rotation mechanism can occur when the planted leg receives a lateral blow. This same mechanism, however, also results in knee injuries. Another common mechanism of injury is landing on an irregular surface such as another player's foot in basketball, or stepping into a hole in a poorly prepared playing field. This can result in an eversion or inversion mechanism.

TYPES OF INJURIES

Sprains to the lateral collateral ligament are by far the most common. In Brostrom's series, where he surgically explored and repaired 105 acute ankle sprains, 65 were isolated complete tears of the anterior talo-fibular ligament. Fifteen were complete tears of both the anterior talo-fibular ligament and the calcaneo-fibular ligaments. There were only three cases that involved all three lateral ligaments. There were no complete tears of the deltoid ligament, although there were four partial tears. As a rule, to completely tear this ligament, the fibular must fracture or the anterior talo-fibular ligament must rupture. There were six isolated complete tears of the anterior talo-fibular ligament.

The same mechanism of inversion and external rotation can lead to fracture. This is usually an oblique fracture of the fibula with or without a fracture of the medial malleolus.

The other significant mechanism of injury in athletes is pronation and external rotation. This injury is rarely a pure ligamentous one, and when it does occur the deltoid and anterior tibiofibular ligaments are torn. Usually, the deltoid ligament rupture is combined with a fracture of the fibula.

CLINICAL EVALUATION

When an athlete sustains a significant injury to his ankle, a history will be given of the foot turning under, accompanied by immediate pain, and difficulty in bearing weight. Often, the injured athlete will describe a "pop" or "snap" or a sensation of giving way.

Initial evaluation will reveal localized tenderness over the ligaments involved. Motion may or may not be restricted. The more difficulty the athlete has bearing weight the more significant his injury. Further participation should be prohibited until a medical evaulation is completed.

The initial decision involves differeentiating a fracture from a sprain. Most fractures about the ankle are obvious, with the exception of the undisplaced spiral fracture of the fibula. Routine x-ray of the ankle will reveal this differential. If the injury is a sprain, then it must be classified as grade I, II, or III. Once this is done, treatment and prognosis can be determined. A grade I sprain is a minor ligamentous injury where the ligament is partially worn or stretched and the joint is stable. A grade II sprain is a more severe injury where the joint remains stable. A grade III sprain is a ligamentous injury resulting in an unstable joint.

The importance of clinical recognition of the unstable ankle cannot be overemphasized. The techniques available to assist this recognition are physical examination, stress x-rays, and arthrography. On the physical exam, the foot may be forcefully inverted, everted, and drawn forward to test stability. The most common injury, that of the anterior talo-fibular ligament, results in anterior instability only. Once the examiner suspects instability on his clinical exam, he may repeat the stress-testing under x-ray. This is usually done best with local anesthesia in acute injuries, as muscle spasm secondary to a painful injury can hide instability. Tilting of the talus within the mortise with supination of the foot is diagnostic of lateral instability. Usually, the ankle does not open more than 7° on the A-P view with an isolated tear of the anterior talo-fibular ligament. However, if the foot is forced forward the talus will sublux anteriorly, which can be documented on a lateral x-ray. If on a straight A-P x-ray of the ankle the talus opens 7° - 30° laterally, then a rupture of both the anterior talo-fibular and calcaneo-fibular ligaments is diagnosed. Gross lateral instability is diagnostic of complete rupture of all three parts of the lateral collateral ligaments.

An injury to the deltoid ligament must always be suspected to be associated with fracture of the fibula or any pronation mechanism of injury. Again, stress testing can be diagnostic by revealing the widening of the medial joint space by x-ray.

Routine plain films of the ankle are also important. Widening of the distance between the tibia and fibula on the oblique view is diagnostic of an injury to the syndesmosis. An avulsion of the very tip of the lateral malleolus is diagnostic of a significant injury to the lateral collateral ligament. Osteochondral fractures of the dome of the talus may accompany any injury resulting in instability.

An arthrogram of the ankle seems to offer very little information over and above stress x-rays. It may be helpful in localizing the specific ligament injured. For instance, if dye escapes from the joint and is seen in the peroneal tendon sheath, it is diagnostic of a tear in the calcaneo-fibular ligament. Whether this test has significant practical value is yet to be determined.

Once the joint injury has been classified and stability determined, a course of treatment can be outlined and the prognosis established. A grade I ankle sprain may be treated with protective support, non-weight bearing, and early rehabilitation. Treatment of grade II sprains depends on the amount of soft tissue injury but is basically that of a grade I sprain---only longer. The treatment of the unstable grade III sprain of the lateral collateral ligament is controversial. Most authors agree that the tear of the anterior talo-fibular ligament with anterior subluxation may be treated by a cast for 4-6 weeks. Most orthopaedic surgeons agree that the grossly unstable ankle, where all three portions of the lateral collateral ligament are ruptured, should be treated by surgical repair. Where the literature is confusing concerns the treatment of the combined tear of the anterior talo-fibular and calcaneo-fibular ligaments--an ankle sprain that opens 7°-30° on stress x-rays. Brostrom explored fifteen of these and found that four had the peroneal tendon sheath interposed, thus obstructing closed repair. He commented that the others would have done well conservatively.

The rehabilitation of these injuries begins almost simultaneously with the onset of treatment. The goal is to obtain a stable, painless, mobile ankle that can undergo the rigors of the athlete's sport. Range of motion and isometric power building to the medial and lateral stablilizers begins as soon as pain and swelling permit. Weight-bearing is not permitted until it can be done without a limp and the athlete has full range of motion without pain. Swimming is permitted even before weight-bearing is allowed. Walking is followed by jogging, running, figure eights, and other maneuvers of the sport before a return to competition is permitted.

I have tried to review the anatomy and pathology of ankle injuries in athletics in some detail. The mechanism of injury, the clinical picture, diagnosis, treatment, and rehabilitation have all been touched upon. I hope this material will be helpful in the prevention, early recognition, and management of ankle injuries.

REFERENCES

1. Brostrom, L.: "Sprained Ankles I. Anatomic lesions in recent sprains." *Acta. Chir. Scand.* 128: pp. 483-495, 1964.
2. Brostrom, L.: "Sprain Ankles II. Arthrographic diagnosis of recent ligament ruptures," *Acta. Chir. Scand.* 129: pp. 485-499, 1965.

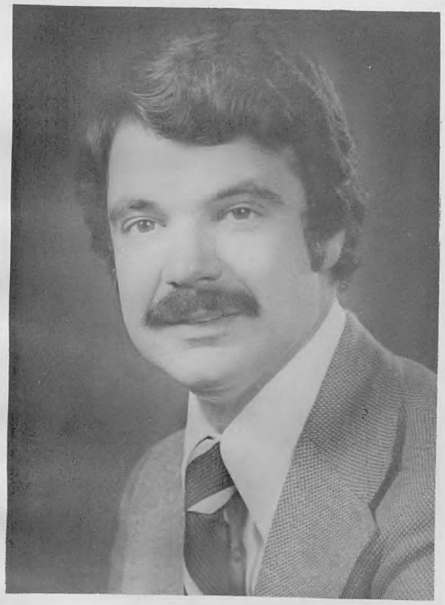
* * * *

Biomechanics of the Foot and Ankle

Injuries of the Foot

G. James Sammarco, M.D.

BIOMECHANICS OF THE FOOT AND ANKLE



G. James Sammarco, M.D.

THE FOOT

The foot is an extremely complicated structure consisting of 27 bones. The common misconception is that since it acts as a single unit, except for the toes, the only functional parts appear to be the ankle joint and the toes (Fig. 1, A, B).

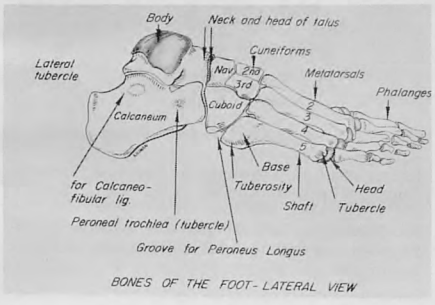


Fig. 1A

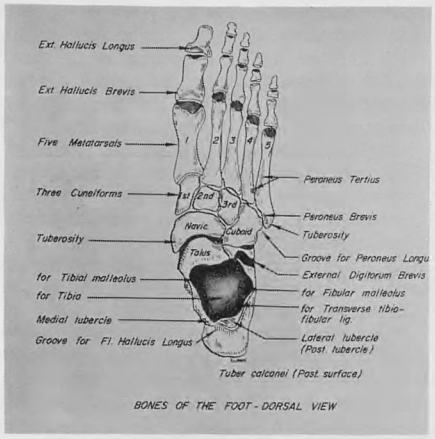


Fig. 1B

Fig. 1--A,B: [A] Lateral and [B] dorsal view of the bones of the bones of the foot.

However, the multiple joints between the small tarsal bones of the foot, as well as the longer bones, the metatarsals, contribute a great deal to motion in the foot. It is the subtle interplay between these bones that allow for turning, running, jumping, as well as standing and bracing of the foot, as is encountered in all sports activities.

THE ANKLE

The study of the ankle motion, tibiofibular-talar articulation, is called "kinematics". The fibula holds the lateral side of the joint and transmits about 3 percent of the load. The rest is transmitted by the tibia to the talus. Two types of motion occur here, flexion (or plantar-flexion) from the neutral position to toe pointing, and extension (or dorsiflexion) from neutral to heel pointing (Fig. 2, A & B). The other, more subtle motion which occurs at the ankle joint is axial rotation. As the foot passes into flexion, it tends to rotate toward the midline of the body, and as it passes into extension it rotates away from the body, and as it passes into extension, it rotates away from the body midline. The motions are coupled so that

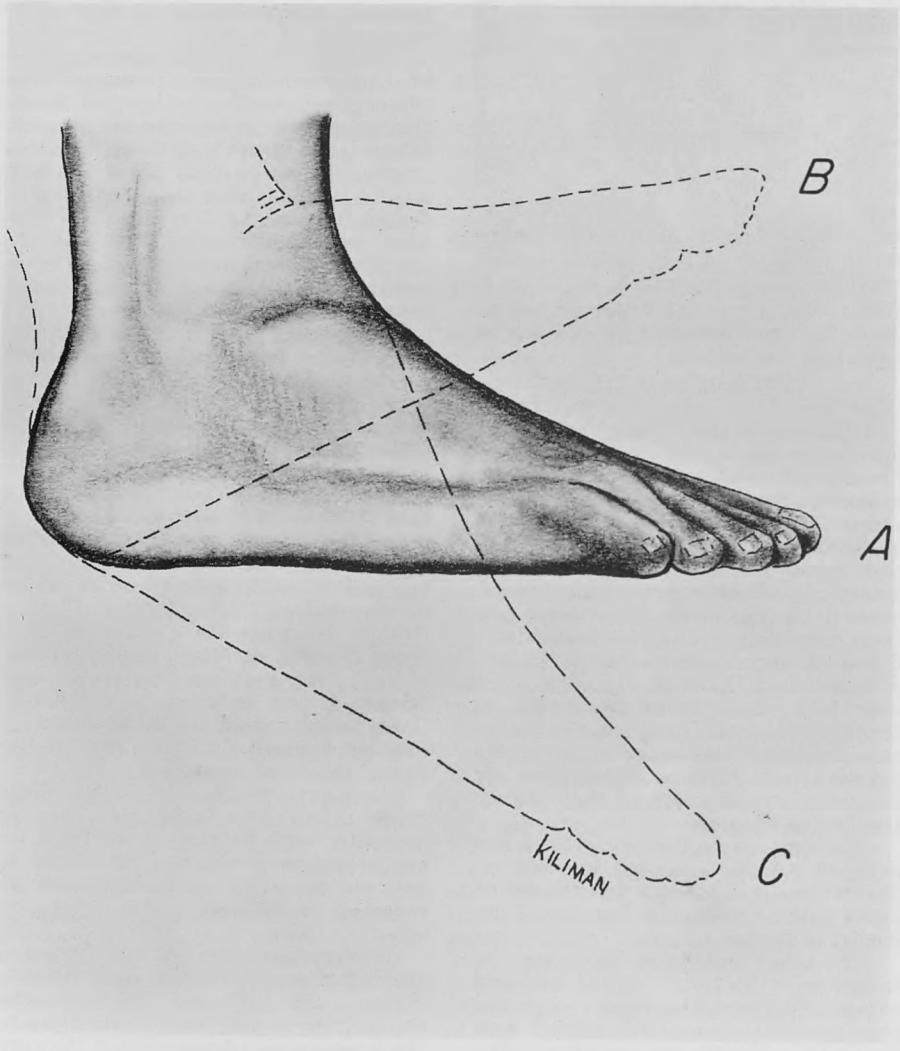


Fig 2A

Fig. 2B

Fig. 2-A,B [A] Lateral view of the ankle showing flexion [c=plantarflexion] and extension [b=dorsiflexion] motion. [B] Anterior view of the foot showing the medial axial rotation [b] which occurs on flexion and the lateral axial rotation [c] which occurs in extension of the ankle.

flexion and adduction occurs at the same time and extension and abduction occur at the same time.

Range of Motion

In measuring the range of motion of an ankle joint, we use as the reference point the subject standing erect. When measured from the neutral position to the limit of flexion (plantar-flexion) and the limit of extension (dorsiflexion) the average extension (dorsiflexion) while the patient is bearing weight is 21 degrees, and the average flexion (plantar-flexion) is 23 degrees. With age, we tend to lose some of the plantar-flexion motion. The range of motion does not change significantly when the subjects are studied while not bearing weight. The total range of motion tends to decrease if the subject had previously suffered injury to the ankle or if he had developed a severe arthritic condition, such as rheumatoid arthritis. This decrease occurs both with the subject standing and, even more so, when the subject is not bearing weight on his foot.

Centers of Rotation and Surface Velocities

As the ankle moved through its range of motion, several axes of rotation occur. The method by which these centers of rotation are determined is called instant center analysis. In this analysis, as the ankle is moved x-rays are taken in five different positions (Fig. 3). Certain points are marked on the tibia for each two positions and an analysis of motion made. A different center of rotation is determined for each two positions. The positions of these centers of rotation then

Fig. 3 (I)

Fig. 3 (II)

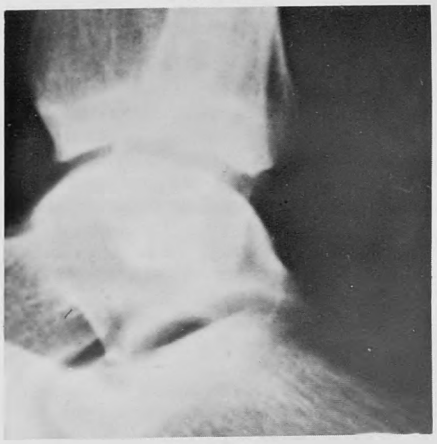


Fig. 3 (III)

Fig. 3 (IV)

Fig. 3 (V)

Fig. 3: Multiple x-rays of the ankle moving from position of flexion [I] to extension [V]. Note that in the neutral position [III] the tibia is perpendicular to the floor.

determine the type of motion occurring between the two bones at the joint surface (surface velocities) (Fig. 4).

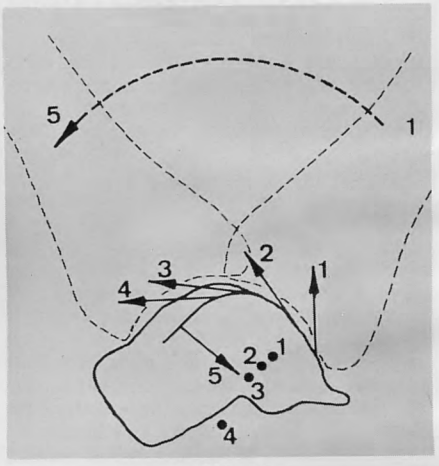


Fig. 4

Fig 4: Instant centers and surface velocities from several superimposed x-rays showing the instant centers of rotation and surface velocities as the joint is moved from a position of extreme flexion [1] to extreme extension [5]. The numbered dots correspond with the centers of rotation for the respective positions of the tibia. The arrows show the direction of surface motion [surface velocity. Note that there are five arrows but only four instant centers. It takes five x-rays to find four centers of rotation.

Centers of rotation tend to lie below the ankle joint surface during most of motion but this is not always the case, even in normal ankles. The surface velocity, shown as an arrow, tends to distract the ankle joint at the beginning of motion. As the leg approaches neutral position, arrows 2, 3, and 4 show that the direction of the arrows is tangential to the surface, representing a gliding motion. The final position of surface velocity, arrow 5, shows the bones jamming against one another with the arrow directed into the talus, and is

called plowing or compression. Thus, the surface velocities in the ankle joint demonstrate that distraction of the joint occurs at the beginning of motion, followed by a period where the surfaces are gliding on one another and finally jam together as the joint reaches the limit of extension. As motion is begun in flexion, the springing apart of the joint may be caused by the formation of a wave of synovial fluid which lubricates the joint, or by the elasticity of the soft tissues. The sliding portion of motion appears to occur in that portion of normal gait that we use most, that is, the 10-15 degrees about the neutral position of the ankle. This motion, used during our walking, constitutes the great majority of the ankle motion. However, in athletes who use full range of motion the extremes of motion are very important. When forced extension of the ankle occurs, surface velocity, showing compression of the joint, becomes particularly important. Baseball catchers tend to get arthritis in their anterior ankle joints due to prolonged squatting.

Abnormal Mechanics of the Ankle Joint: Ankle Sprains

When a basketball player jumps for a rebound and on returning to the floor inverts his foot and twists his ankle inward, after catching his shoe, he may suffer a tear of the lateral ankle ligaments. Athletes with "weak ankles" that appear between the ages of 20-40 owe them to many ligament strains during sports activities as a growing child (Fig. 5). With gross ligament tears or multiple small "strains" the kinematics of the ankle change. When the foot is flat on the ground and not stressed as in running, jumping or turning, the surface velocities show sliding motion at the joint surface. However, as the subject runs, jumps or otherwise unweights the foot, the motion at the ankle changes drastically. The joint slides both forward and backward, and distracts. Destruction of normal ligament structures has allowed the joint to move in an abnormal fashion. If this abnormal motion is permitted to continue

Fig. 5 (A)

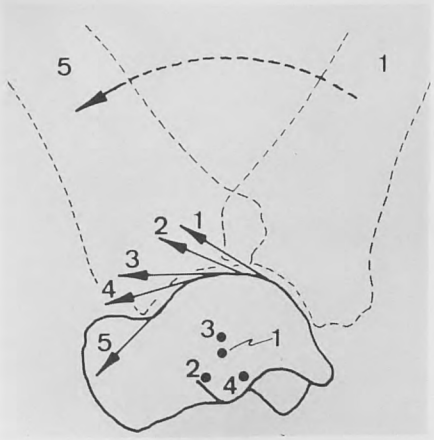


Fig. 5 (B)

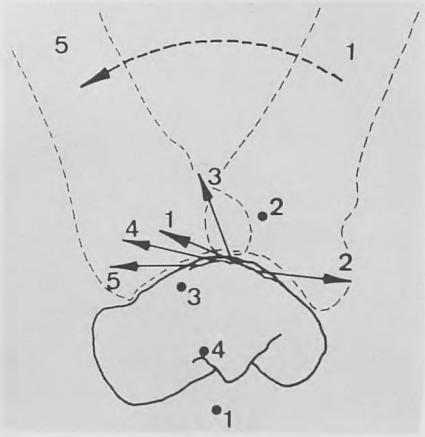


Fig. 5 (C)

Fig 5--A,B,C: An x-ray of an ankle of a young man with a tear of the lateral ankle ligaments. [A] The x-ray shows an ankle that is completely normal. [B] Analysis of motion with the patient bearing weight demonstrates that motion generally procedes in a normal or orderly fashion with sliding occurring throughout. [C] When the study was repeated non-weightbearing, there is grossly abnormal motion in the ankle due to loss of ligamentous stability, occurring when the player jumps and turns.

and the ankle not repaired by surgery, gross degenerative arthritis occurs over a period of years. In the meantime, the ankle is unstable and gives way while stepping off a curb, climbing stairs, or on the playing field.

Ankle Fractures

When an ankle is fractured the joint surface is always involved and healing of the fracture may be followed by traumatic arthritis. This condition may occur even if the fracture fragments have not been displaced significantly at the time of the fracture, and it may even occur when surgery is performed to reduce the fracture fragments. The arthritis is generally related to the severity of the original injury. After the fracture heals, small incongruities which occurred on the smooth, articular, cartilaginous gliding surface of the joint begin to wear. Cartilage is ground off the surface. parts of cartilage may break loose and float about within the joint. These "joint mice" also impede the smooth mechanics of the joint. Traumatic arthritis, due to abnormal motion on the joint surface, then develops. The range of motion of the joint decreases, and changes on x-ray appear. The clear joint space as seen on x-ray, normally occupied by cartilage decreases. Osteophytes form at the edges of the joint (Fig. 6). As the arthritis becomes more severe the patient will have pain associated with the changes in the weather, as well as

Fig. 6 (A)

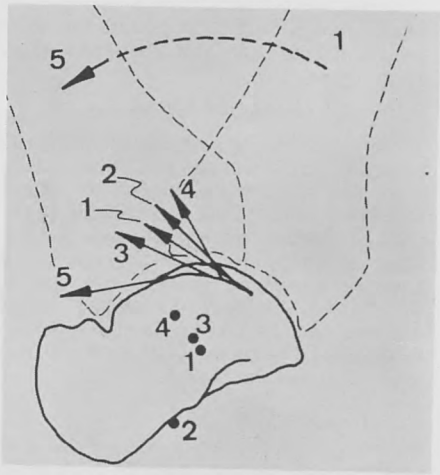


Fig. 6 (B)

Fig. 6--A,B: [A] A lateral x-ray of the ankle of a patient who had suffered a fracture of the medial and lateral malleoli of his ankle 10 years previously. The ankle has now become arthritic. The width of the joint space, normally occupied by smooth cartilage which does not show on the x-ray, has deceased. The normally smooth bony surface beneath the cartilage appears ragged. Motion is decreased. [B] The instant center analysis shows surface velocities indicating motion at the ankle joint is not occurring in a smooth, orderly fashion. Arrow #1 shows that the tibia, or leg bone, is sliding backwards. Surface velocity [arrow #3] shows, once again, a sliding backwards, now with compression occurring where normally gliding would occur. Such an ankle injury requires surgery to relieve the pain.

motion. it is at this point that surgery may be necessary to relieve pain, increase motion, and maintain stability.

THE FOOT

Bones: The Arch, and the Beam

The arch of the foot is determined by shape of the tarsal bones. In the normal foot, the arch is already formed in the fetus of three-months gestation. The term "arch" is used to describe the shape of the bones of the foot. Experiments show that the foot functions more as a beam (Fig. 7). As a load is applied to the center of a beam compressive stresses appear on the upper surface of the beam and tensile stresses occur on the bottom of the beam. Likewise, the ligaments holding the tarsal bones on the plantar (inferior) surface of the foot develop tension as the load increases on the upper surface of the foot. It has been demonstrated that when up to 400 pounds is loaded on the knee of a living subject, who is sitting, and x-rays are then taken of the foot, the metatarsal bones actually bend beneath the load.

Plantar Aponeurosis: The Truss and the Windlass

The foot also acts like a truss (Fig. 8). A truss has two rigid members joined by a pivot which allows those members to move. The unjoined ends of the two members are connected by a tether. This principle is demonstrated in the foot by the plantar aponeurosis which acts as a tether.

The height of the truss can be raised if the tether that holds the two rigid members together is shortened. The plantar aponeurosis is attached to the calcaneus and runs forward beneath the metatarsals to attach into the proximal phalanx of each toe. The height of the arch is raised when the plantar fascia which connects the heel to the toes is drawn tight. This shortening of the plantar aponeurosis is done through a mechanism called the Spanish windlass. The Spanish windlass consists of two members connected by a pivot. A tether is attached to one member and drawn about the pivot so as to make the pivot a pulley. When the two members are straight the tether is in a given position, but as the movable member is rotates the line is drawn over the pulley (Fig. 9).

The system of the truss and the Spanish windlass is found in the plantar aponeurosis (Fig. 10). As the toe is extended, the plantar aponeurosis shortens by the mechanism of the Spanish windlass, tightening the tether of the truss and raising the height of the arch. The foot becomes quite rigid, due to tightening of the ligaments between the tarsal bones. This "passive" stiffening stabilized the foot. It is "passive" because active muscle pull is not required to achieve this position. It occurs as a baseball catcher squats, or a player jumps, or "pushes off" with the ball of the foot. The toe is flat on the ground in forced extension and the rest of the foot is raised. This passive means of stiffening the foot stabilizes the player's position and allows him to keep his balance by transferring the hip, knee and ankle movements directly to the ground, by-passing the joints of the foot. The foot

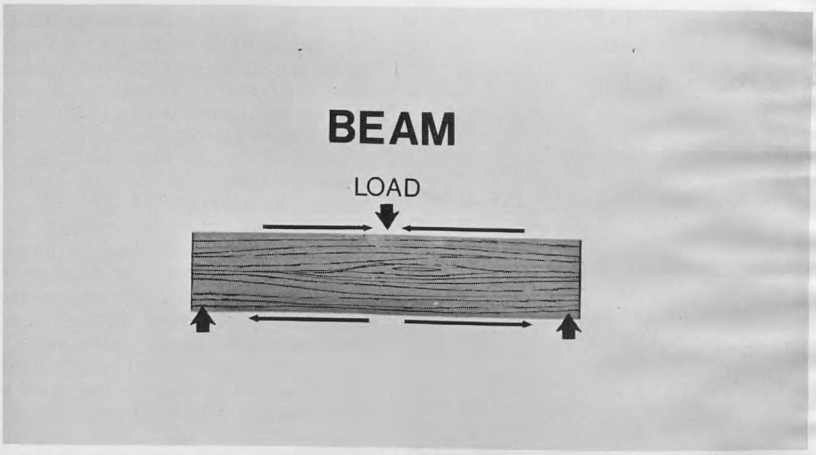


Fig. 7

Fig. 7: At times the foot acts as a beam. When a load is applied to the center, compressive forces occur on top (arrows directed toward each other) and tensile forces occur on the bottom of the beam (arrows directed away from each other).

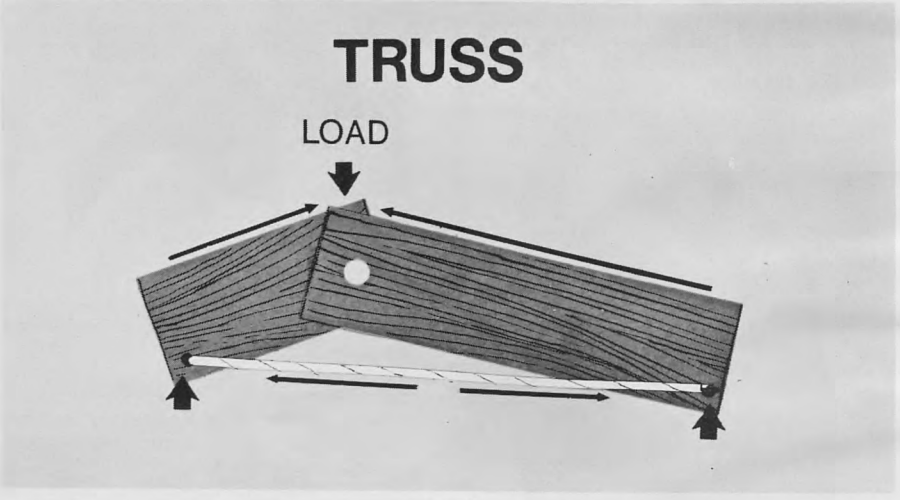


Fig. 8

Fig. 8: The truss is two rigid members connected by a pivot and join by a tether. The foot also functions as a truss.

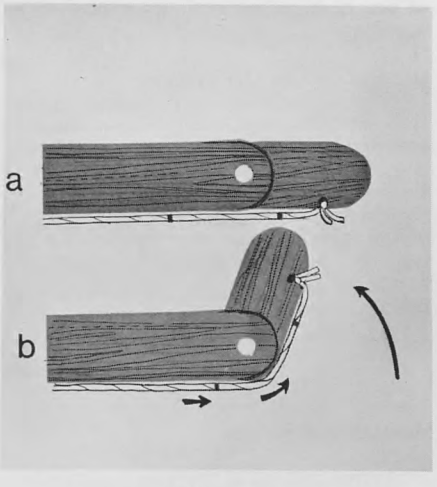


Fig. 9

Fig. 9-A,B: [A] The principle of the Spanish windlass. Two members are connected by a pivot. A tether is attached to one member. Two marks on the rope illustrate the position of the tether. [B] As the movable member changes position the line is drawn about the pulley, thus tightening the line.

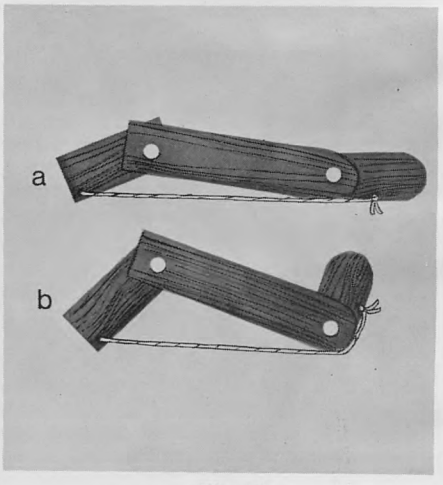


Fig. 10

Fig. 10-A,B: [A] The principle of the Spanish windlass and truss are combined in the plantar aponeurosis. [B] Extending the great toe tightens the tether and raises the arch, tightens the intertarsal ligaments, and compresses the tarsal joints, thus stabilizing the foot.

acts as a single unit rather than as 27 bones in motion.

Forces Within the Foot

The different portions of gait during normal walking are described as the swing phase in which the foot is not in contact with the floor, and the stance phase which occurs from the time the heel strikes the floor until the time the toe leaves the floor. The stance phase is further divided into three basic portions: heel strike beginning at the time the heel just touches the floor; foot flat when the weight is borne directly over the foot; and toe off, when force is applied to the forepart of the foot. During normal gait there is a period when both feet are on the ground at the same time. This portion of gait is called the period of double stance and accounts for approximately 20 percent of the normal walking cycle. The faster a subjects walks, the smaller the period of double stance becomes until running occurs, at which time it disappears entirely.

Standing at rest the load borne by the foot is evenly divided between the heel and the forefoot (Fig. 11). If the load borne by the foot while standing were divided into 12 equal parts, 6 of those parts would be transmitted through the heel and 6 parts transmitted through the metatarsal heads (ball of the foot). The load distribution in the forefoot is further divided so that the first metatarsal would transmit twice the load of each of the lateral metatarsals.

However, when the subject walks, a different type of mechanism comes into play. At the moment of heel strike the load is transmitted to the lateral heel, and it is then transmitted through the tarsal bones along the medial side (inside) of the foot to the medial tarsal bones. These are the navicular and the first and second cuneiforms. From there the load is transmitted to the first and second metatarsal heads and through the lateral metatarsals to the ball of the foot as the subject begins to push off. The greatest amount of weight is borne beneath the head of the second metatarsal and is then transmitted to the great toe (Fig. 12) as the foot leaves the ground.

Therefore, there is a difference in how the foot bears weight while in motion, as opposed to merely standing still. When a portion of the foot is injured the rest of the foot accomodates to this by increasing the amount of weight borne on either side of the injured area, thus decreasing the load borne on the injured part and happens, for example, if one of the metatarsals is fractured.

Fig. 11

Fig. 12: If the weight borne across the foot while standing is divided into 12 equal parts, 6 parts are borne across the heel and 6 parts across the metatarsals. The load borne by the metatarsal heads is divided so that the first metatarsal head carries twice the load as each of the remaining metatarsal heads.

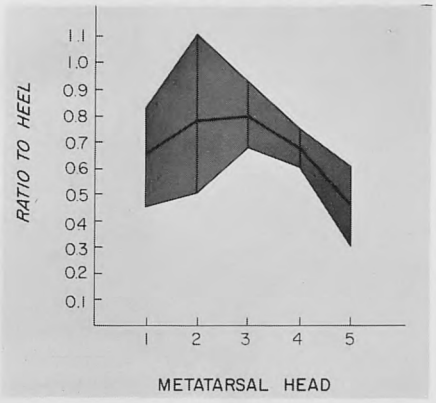


Fig. 12

Fig. 12: The load borne across the metatarsal heads during the push-off portion of the stance phase. Note that the increased amount of weight is borne beneath the head of the second metatarsal rather than beneath the head of the first metatarsal, as occurs when standing.

Muscles and Motion

Active motion in the foot is controlled by two basic sets of muscles. The groups of muscles are those which take their origin outside the foot in the leg, called "extrinsic" muscles, and those which have their origin within the foot, called "intrinsic" muscles. The long tendons which flex and extend the toes are attached to the distal parts of the toes through a complex mechanism (Fig. 13)

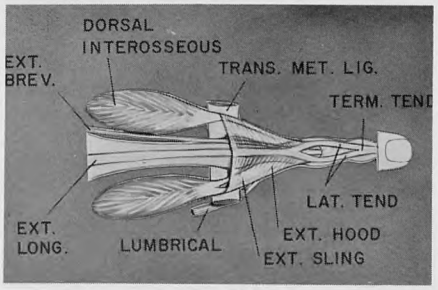


Fig. 13

Fig. 13: The anatomy of the tendons and muscles of the toe in the dorsal view. The extensor tendon attaches not only to an extensor sling and extensor hood, but also attaches to the middle phalanx of the toe.

The extensor longus tendon, an extrinsic muscle, attaches to the extensor hood and extensor sling, and inserts on the middle phalanx where it splits into lateral tendons which then insert on the distal phalanx. The extensor tendon does not attach to the proximal phalanx, but rather supports the proximal phalanx by means of the extensor sling. As the tendon pulls, the extensor sling lifts the proximal portion of the toe into extension, while straightening the middle phalanx (Fig. 14).

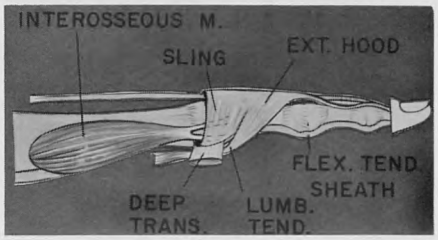


Fig. 14

Fig. 14: Side view of the toe showing the positions of the long extensor tendon and the interosseous and lumbrical muscles, as well as the extensor sling and extensor hood. The pull of the interosseous and lumbrical muscles on the extensor hood is such that the force is transmitted to the top of the toe. Therefore, when these muscles contract they extend rather than flex the distal parts of the toe.

The interosseous and lumbrical muscles (intrinsic muscles) insert into the proximal phalanx and, in part, into the extensor hood. The action of the interosseous and lumbrical muscles is important in flexing the metatarsal phalangeal joint and in extending (straightening) the middle and distal joints of the toe. This latter action is due to the action of the extensor head. The lumbrical tendon lies beneath the transverse metatarsal ligament. This placement of the muscle tendon away from the centers of rotation of the metatarsal phalangeal joint gives this smaller muscle a greater mechanical advantage than if it were to lie near the center of rotation, even though it is a small muscle. The muscles which flex all joints of the toe are the flexor digitorum longus, (extrinsic) and the flexor

digitorum brevis (intrinsic) which flex the metatarsal phalangeal and proximal interphalangeal joint, and the long and short flexors of the great toe (Fig. 15).

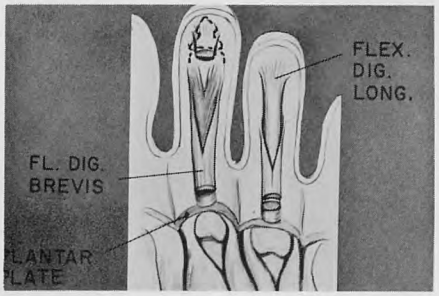


Fig. 15

Fig. 15: Plantar view of the flexor tendons. The long flexor emerges from between the flexor brevis to insert on the distal phalanx.

The flexor digitorum brevis attaches to the middle phalanx of the toe, but before doing this it splits into two portions. The flexor digitorum longus attaches to the distal phalanx of the toe after it has passed out through the split of the brevis tendon. The function of these two tendons is forceful flexion of the toe.

During the process of walking, as the foot moves into push-off position, the long and short flexor muscles flex the toe and the interosseous and lumbrical muscles flex the metatarsal phalangeal joints and extend the interphalangeal joints. All of these muscles acting at the same time stiffen the forefoot. This makes the walking platform of the foot longer and allows the subject more of a mechanical advantage as he shifts his weight to the opposite foot. During this period the opposite foot has already made contact with the ground during the period of double stance and these muscles give the foot a certain springiness in shifting the load.

SUMMARY

Selected aspects of the biomechanics of the foot and ankle have been represented. All joints move through a range of motion about multiple axes of rotation. The motion on the joint surfaces are generally gliding motions with important changes taking place at the extremes of motion. Injury can change the normal pattern allowing arthritis to develop. The arch of the foot and the plantar aponeurosis have been described and their functions discussed. The distribution of forces within the foot during normal gait as well as toe motion and muscle function have also been described. An understanding of the ankle-foot complex is necessary in training athletes, and also an understanding of the mechanisms of possible injury, so that safer practices can be adopted in sports.

* * * *

INJURIES OF THE FOOT

G. James Sammarco, M.D.

Injuries of the foot in athletes are common. The severity of such injuries varies considerably. They range from soft tissue trauma as one would expect to find in barefoot running or in track or field events, such as long-distance running, to severe fractures and dislocations from football, wrestling, and basketball.

TRAUMA

Soft Tissue Trauma

If a runner runs barefoot certain tissue reactions occur about those portions of the foot continually in contact with the ground. As the foot strikes the ground, certain reactions take place beneath the skin. The foot is striking a hard surface again and again causing mechanical stress, both normal (perpendicular) to the skin and shear (tangential) to the skin. The tissue then heats up. Furthermore, continued trauma of this sort causes a reflex dilatation of blood vessels, hence an increase in warmth and a slight swelling. The surrounding soft tissues then show a chemical change. The cells that are seen in the reaction of inflammation begin to migrate into the area. If the foot is allowed to rest, the heat and microscopic swelling subside; with repeated activity, however, the period of time required for recovery increases and if the running continues unabated a feeling of burning and swelling in the feet is felt. Blistering may follow. The body reacts to this type of injury over a period of time by producing a callus beneath those areas of contact between the foot and the ground or the shoe. Therefore, as the runner builds up his tolerance he is, in effect, building up the ability of the soft tissues to resist continued trauma. The blistering caused by excessive running on the unprotected foot occurs under those metatarsal heads which tend to transmit the most load. It also occurs on the sides of the foot and in the medial portion of the great toe at the interphalangeal joint. If footwear is improperly fitted, it may occur at the proximal interphalangeal joints of the lesser toes, including the small toe.

A second type of soft tissue injury is crush (Fig. 1). Crush injuries are encountered in football and baseball events when the foot may be accidentally stepped on by a runner, struck by a bat, or the like. These injuries are particularly dangerous in that they are misleading and may have disastrous sequelae. If, for instance, a first baseman has his foot stepped on by a runner, unless a fracture results, immediate examination of the foot does not necessarily reveal the extent of the injury. Immediately following the accident, only a small amount of swelling is noted and perhaps an area of redness and even a minimal amount of tenderness. However, at the time of this impact nearly all the living cells of the foot are injured, either by bursting, from the initial impact, or from contact with toxins produced by other cells which have already been directly injured. As a result, the injury is often neglected for a few hours. Unfortunately, the player holds his foot in a dependent position, that is, with the foot lower than the level of the waist. Severe swelling now occurs in two or three hours. Blood vessels are also made of cells and the walls of the blood vessels are injured in the same way. Over a period of two hours, the foot will become extremely tender and swollen, and excruciating pain then ensues. By this time it matters not what position the foot is held in--the pain is unbearable. It is now that emergency treatment is sought. If the blood clots within the vessels then additional swelling occurs, due to lack of venous drainage. This loss of circulation causes the tissues to die, and can lead to gangrene which, in turn, may require amputation of the toes several weeks later.

Fig. 1

Fig. 1: Crush injury of the great toe. The injury causes compromise of the blood vessels, and requires partial amputation of the first and second toes.

Immediate treatment, however, is an evaluation of the injured extremity, plus bed rest, a compression dressing so that even pressure can be applied to the foot without additional compromise of the circulation, and ice packs outside the dressing. The foot is elevated until swelling subsides within 2-3 days, when active motion can be prescribed. Active motion (the flexing and extending of the joints by one's own muscles) may be started even in the compression dressing in order to aid in "milking" the tissues of excess fluids. The period of recovery depends upon the severity of the injury. A foot that has suffered a severe crush injury may be permanently stiff.

The foot is divided into three sections for convenience in dealing with these different fractures and dislocations.* The hindfoot comprises the talus and the calcaneus; the midfoot comprises the navicular, cuboid, and three cuneiform bones, and the forefoot is comprised of the metatarsals and phalanges.

Hindfoot Fractures

Fractures of the calcaneus usually occur from a fall or a jump to a hard surface. Since this is the heel bone, the victim, landing improperly on his heels, must dissipate a tremendous amount of energy through the skin and soft tissues, the calcaneus and adjacent bones and joints.

The severity of the fracture depends upon the condition and agility of the athlete, the type of surface that the subject lands on, and the amount of tension the muscles are under. Fractures

*Refer to "Biomechanics of the Foot and Ankle."

which do not involve joint surfaces have a much better prognosis than those that do. Simple, nondisplaced fractures which do not alter the position of the joints cause a minimal amount of discomfort and heal uneventfully (Fig. 2). The initial

Fig. 2

Fig. 2: X-ray of the calcaneus, lateral view. The fracture does not involve a joint surface and the fragments are well aligned. This will heal uneventfully.

discomfort may be so slight that the player may not realize he has a fracture, and even x-rays may fail to reveal a fracture. However, over a period of days, because of increased pain and discomfort on walking and swelling in the foot, repeat x-rays are taken by the physician that now reveal a fracture line. Treatment of such a fracture requires a cast for four weeks, followed by active motion of the foot, and a range of motion exercises.

Fractures that involve the joints are of a more severe nature, cause more pain, and are more difficult to treat; they also have a longer recovery period and generally a poorer prognosis. Treatment of such fractures requires that the joints that are disrupted be placed back in their original positions. This placement requires not only a general anesthetic and manipulation but also specially applied casts.

Fracture of the posterior tuberosity of the calcaneus often occurs in an activity such as serving a tennis ball (Fig. 3). As the weight is placed on the ball of the foot, the muscles of the posterior calf must contract to support the body. The gastrocnemius muscle, which attaches to the calcaneus, may rupture within its substance or pull its attachment from the

Fig. 3 (A)

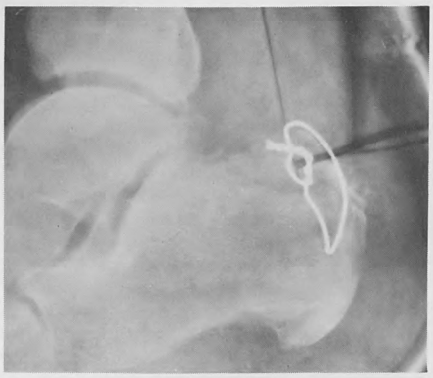


Fig. 3 (B)

Fig. 3: A. A tennis player with an avulsion fracture of the posterior calcaneal tuberosity. The Achilles tendon has pulled the bone apart. B. The fracture reduced by surgery.

calcaneus. It is repaired surgically. It does not involve a joint and usually heals without difficulty.

Fractures of the talus bone can be extremely difficult to deal with, but they are rare in well-trained athletes. However, because of the nature of the blood supply to the talus, certain fractures through the neck of the talus may cause the body of the bone to die by interrupting its internal blood supply. When this injury occurs that part of the talar bone which articulates in the ankle joint, known as the talar body, becomes arthritic. Thus, fractures of the neck of the talus, that portion between the ankle joint and the foremost part of the bone, are particularly dangerous. These fractures are caused by a strong force driving the forefoot upward, and may require surgery for proper reduction.

Fractures within the ankle joint itself, such as chips off the joint surface of the talar dome are caused by strong forces applied to one side of the joint surface. These chips may break loose and cause locking of the ankle joint. The loose bodies ("joint mice"), produced by dome fractures, may require surgical escision.

Dislocations in the hindfoot are quite rare and occur at the subtalar joint, that joint between the talus and calcaneus. Such severe injuries occur with low-cut shoes such as those worn in soccer and football, and are usually the result of a great force being applied. Dislocation between the hindfoot and the midfoot is very rare and is usually the result of a force of great magnitude. This severe dislocation is usually accompanied by fractures.

Midfoot Injuries

A common injury in the midfoot is the avulsion fracture of the navicular tuberosity (Fig. 4). The tendon of the tibialis posticus muscle attaches on the medial, and on the underside, of the navicular bone. It has a very extensive attachment, attaching not only to the navicular bone, but also to several other bones of the midfoot and even to the undersurface of the metatarsals. In jumping or running, such as in basketball, undue stress may be placed on its attachment to the navicular tuberosity by sudden tension due to muscle contraction.

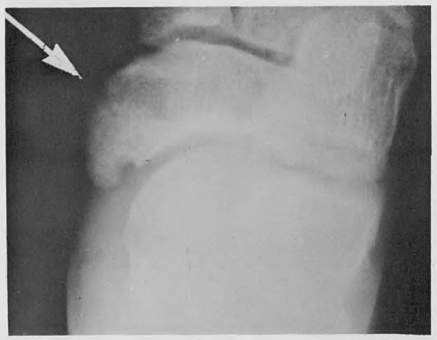


Fig. 4

Fig. 4: Fracture of the navicular tuberosity. Pain at the instep is noted. Tenderness is present over the prominence of the navicular bone. This fracture may recur if the player is not properly rehabilitated.

The tuberosity is then pulled from the body of the navicular. Pain and tenderness occur along the inside of the foot. This injury is treated by strapping of the foot for a period of three weeks and wearing an arch support during that time, after which active motion is begun. Chip fracture of the navicular is caused by the forefoot being forced into acute flexion. The sprinter catching his toe can incur such an injury (Fig. 5).

Fig. 5

Fig. 5: Chip fracture of the navicular, caused by relative downward thrust of the forefoot. The toes may be caught and the hindfoot pulled upward, as when a sprinter catches his toe.

Forefoot

Injuries of the forefoot, that is, of the metatarsals and toes, are of special significance. Of particular interest is the so called "march" fracture, or stress fracture, of the metatarsal shaft (Fig. 6). Since the foot moves dynamically when running, an increased load is carried on the head of the second metatarsal as the body weight is transferred from heel to toe. When an athlete is poorly trained or in poor physical condition, as might occur at the beginning of a season, the ligaments and bones of the forefoot, as well as the muscles of the forefoot, are not of sufficient strength to support continued loading. Accordingly, the increased stress applied in a normal manner, i.e., the physiological manner, causes the bones and ligaments to fatigue. Normally, when living bone is

stressed micro-infractions will occur. The body responds to these infractions by first resorbing the bone around the microfracture site and then laying down more new bone to handle the increased stresses. However, when stress is continued and the rate of destruction exceeds the rate of repair, a thin fracture line occurs. Since most of the body weight is carried to the second and third

Fig. 6 (A)

Fig. 6 (B)

Fig. 6: A. Stress fracture--x-ray of the foot of an athlete with forefoot swelling and pain for 10 days. A very thin line is noted in the second metatarsal shaft. B. Two weeks later callous formation about the fracture has occurred.

metatarsals and then to the toes, the player begins to feel pain over those bones in his forefoot. As a result, he usually is unable to perform well. If x-rays are taken within the first ten days to two weeks, no reaction can yet be seen about the bone. However, at about four weeks, a thin line can be seen and signs of early healing, i.e., callus formation. This injury is a "stress fracture." If has been called the "march" fracture in the past because of its common occurrence in army recruits. Stress fractures are best treated with elastic adhesive dressing and limited weight-bearing in a stiff-soled shoe, such as a wooden clog. This fracture will require four to six weeks to heal.

Another fracture of the undertrained or poorly trained athletes is the Jones fracture (Fig. 7). In this fracture, the tip

Fig. 7

Fig. 7: The Jones fracture [upper arrow]. The tendon of the peroneus brevis muscle has avulsed the styloid [proximal tip] of the metatarsal of the small toe. Tenderness and pain are present in the middle of the outside of the foot. An acessory bone is also present, not to be confused with the fracture [lower arrow].

of the styloid of the fifth metatarsal is avulsed. The tendon of the peroneal brevis muscle attaches to this styloid on the outside of the foot. When the muscle is forcibly contracted, as in active flexion of the ankle, the styloid is pulled from the test of the bone. The basketball player on catching his foot, and inverting and twisting it beneath him, can also sustain this injury.

Fractures of the metatarsal shaft, on the other hand, are often caused by one player stepping on another's foot (Fig. 8).

Fig. 8

Fig. 8: Fracture of the metatarsals. Another player has stepped on this football player's foot. One must be ever mindful of the severe soft tissue injuries which accompany this fracture.

Such a force may exceed 600 pounds and can easily cause such fracture, even in a stiff shoe. The fracture is often associated with significant soft tissue injury, and one must be ever mindful that the foot should be elevated until the swelling subsides. If the foot is not elevated, after application of the cast, swelling and slough of the skin can occur on top of the foot. These fractures take approximately four to six weeks to heal. Proper treatment of the fracture depends on two principles--maintaining the length of the metatarsal bones, and insuring that the metatarsal heads are at the same level. If one of the metatarsal heads is depressed, pain and callus formation will occur under that particular area with resultant pain.

Fractures of the toes are of two types, those resulting from cruch injury as the foot is stepped on, or caught beneath an object, as the rest of the foot is dorsiflexed and extended over that object. There may be considerable soft tissue damage and resultant gangrene in such injuries. The most common toe involved in this injury is the great toe. Dislocation of the interphalangeal joint of the great toe is not uncommon. A different type of toe fracture is that caused by directly striking the toe against a hard object, such as a post, and usually results in a fracture of the proximal phalanx (Fig. 9). Treatment of the crushing type

Fig. 9

Fig. 9: Fracture of the proximal phalanx of the fourth toe. This commonly occurs in unsupervised "sandlot" ball, where the players are barefoot.

fracture of the great toe consists of elevation, thorough cleaning of the wound if such is present, and application of ice packs, along with the compression dressing. Treatment of the simple fracture of the phalanx is best accomplished by splinting the toe to an adjacent toe by means of tape. Three weeks immobilization in this manner is sufficient to allow healing.

The proper treatment of injuries begins with the training of athletes. An understanding of the mechanisms and a high index of suspicion that a significant injury may be present are even more important than the physical therapy following an injury. In this way, further injuries can be prevented: Forewarned is forearmed.

* * * *

Proper and Improper Athletic Footwear, and its Effect on Athletic Performance

Congenital, Developmental, and Static Deformities of the Foot: How They Affect Athletic Performance

Joseph S. Torg, M.D.

PROPER AND IMPROPER ATHLETIC FOOTWEAR AND ITS EFFECT ON ATHLETIC PERFORMANCE

Joseph S. Torg, M.D.

Footwear for athletes should be given the same consideration as any other piece of athletic equipment. It should protect the wearer from injury, help facilitate athletic performance, be durable in construction yet economically feasible to own. It must be appreciated, however, that, in the final analysis, it is the ability of the player and not the nature of the shoe that determines the quality of athletic performance. Certainly, Hank Aaron would be hitting them out of the park in bedroom slippers; conversely, there is no shoe that will convert a journeyman into an all-star performer.

In considering proper and improper footwear for athletes, there are four areas to be considered: (1) the shoe-surface interface, (2) shoe component and construction, (3) shoe size and fit, and (4) the shoe-player interface. Regarding the shoe-surface interface, engagement of the shoe on the surface should provide the player with a reasonable amount of traction. However, should the shoe fix the foot to the surface, the stresses exerted upon the lower extremity would then be absorbed by the articular and periarticular structures of the knee joint. Should this force the joint into a plane other than that of normal knee motion and exceed the elastic capabilities of the structures stressed, injury will result. It is recognized that knee injuries in organized American football present a serious national health problem. Each season, there are an estimated 100,000-130,000 knee injuries among professional, collegiate, scholastic, and sandlot players, with 30,000-50,000 of these requiring surgery. It is recognized that the major cause of these injuries is due to the conventional seven-posted football shoe fixing the foot to the surface.

Torg and Quendenfeld (1) have demonstrated that the solution to this problem is to modify the football shoe to precent fixation. If a shoe with a few long cleats causes fixation, then a shoe with many short cleats should prevent it. This has been verified in a comparative study in the Philadelphia Public and Catholic High-School Football Leagues, where it was demonstrated that switching from the conventional shoe, with seven ¾" cleats, to a soccer type shoe, with fifteen 3/8" cleats, considerably reduced the incidence and severity of knee injuries.

Torg, Quendenfeld and Landau (2) have demonstrated, in a laboratory study, that the conventional football shoe, with ½" cleats as specified by the NCAA and the National Federation of State High School Athletic Associations, is probably unsafe on grass. Further-

more, the molded sole soccer type shoe with fifteen cleats with a 3/8" cleat tip diameter, widely used by college and professional players on Astroturf, is probably unsafe on this surface. They have therefore recommended that the molded sole soccer type shoe with fifteen ½" cleats with ½" cleat tip diameter be worn on all surfaces, both natural grass and artificial. Further studies have demonstrated (3) that these specifications apply only to soles consisting of a synthetic polyurethane material. Natural rubber soles, regardless of sole and cleat configuration, are probably unsafe on Astroturf, and such shoes are not recommended on this surface.

The components and construction of a shoe are of concern with regard to durability and fit. The basic materials used in the construction of the uppers of a shoe are five: (1) cowhide, (2) kangaroo hide, (3) nylon weave, (4) plastic, and (5) canvas.

Regarding the use of kangaroo hide, environmentalists in several states have initiated the passage of legislation prohibiting the use of this material in the construction of football shoes because of the danger of the kangaroo species becoming extinct. Because of this, several of the major athletic shoe manufacturers in this country are now using cowhide and nylon woven fabric exclusively in the manufacture of their shoes.

The durability of the nylon fabrics is quite good. Hwever, nylon has one disadvantage in that it does not have the ability to stretch, as does cowhide. Therefore, in fitting a player, extra care must be taken to see that the shoe fits properly, because the nylon will not stretch and mold itself to the configuration of the foot.

Plastic is used in the construction of the uppers of cheaper shoes but one potential problem with this material is that it does not breathe. Ideally, it would be best to have an upper constructed of a material that breathes, so as to permit adequate "ventilation" of the foot.

Three materials are used in the construction of the soles of the various forms of athletic footwear: (1) leather, (2) rubber, and (3) polyurethane. The sole of the shoe may be joined with the upper by one of these four methods: (1) Goodyear welt, (2) Littleway stitch, (3) cement and rivet, and (4) injection mold.

The Goodyear welt method has the distinct advantage of allowing for replacement of a worn sole. The construction is similar to that of the dress oxford; that is, the outer sole is sewn onto an inner sole. Thus, when the sole wears out, it can be taken to the local shoe repairman and replaced. With shoes constructed by the Littleway stitch method, it cannot, and requires return to the factory for repair. Despite the obvious economy afforded by the Goodyear welt, very few of the all-purpose shoes for athletes are constructed by this method.

In selecting a cleated shoe, care should be taken to ensure that the shoe has a rigid sole in the forefoot. In the conventional football shoe, this is provided by the metal plate to which the posts are riveted. However, in the multipurpose shoe, the manufacturer must reinforce the forepart of the sole, necessary in a cleated shoe to protect the metatarsophalangeal joint from hyperextension injuries--that is, the so-called "Astrotoe." So much for the anatomy of a shoe.

The next area for consideration is that of shoe size and fit. Ideally, shoe size should reflect three dimensions: (1) length from toe to heel, (2) width across the metatarsal arch, and (3) the distance from the heel to the first metatarsal head. However, the size of a given shoe as determined by a manufacturer may not accurately indicate how well it will fit a given foot. The actual size of the last varies from manufacturer to manufacturer, and what might be a size 10 shoe for one may be either larger or smaller for another. Also the European manufacturers do not manufacture a variety of widths. Thus, we see the shoe size is stated by the manufacturer should be considered nothing more than an approximation with regard to possible fit.

Proper shoe fit can be ascertained by following several simple guidelines. First, when fitting a pair of shoes, the individual should have on a pair of the type of socks that he will be wearing with the shoe. The shoes should then be snugly laced and the individual instructed to stand and walk in them in order to determine comfort. After it has been determined that the shoes are comfortable, three things should be done. To determine that the shoes are of the proper length, with the foot in the weight-bearing position, the examiner should place the size of his thumb against the end of the great toe and see where the thumb pad falls in relationship to the end of the shoe. The "rule of the thumb" is that there should be enough space between the end of the toe and the end of the shoe to accomodate anywhere from one-half to a full breadth of the examiner's thumb pad. In other words, there should be at least ½" of free space in the toe of the shoe. Next, again with the athlete in the weight-bearing position, the examiner should determine the adequacy of the width of the shoe by applying the "pinch test." One should be able to grab hold of the upper by pinching the leather as it transverses the metatarsal heads. If it is not possible to do this, then the shoe is too tight, and the individual should be refitted. The third, and perhaps most important, determination is to make sure that the first metatarsal head falls just anterior to the end of the medial counter to the point where the shoe flares out medially at the anterior aspect of the instep.

Assuming that the shoes do not fit, then one of two things will happen: the shoes gives, or the foot gives; fortunately, usually it is the former. However, poorly fitting shoes can cause blisters, bunions, hammer toes, Achilles bursitis, and other irritating lesions.

The final aspect of this paper will deal very briefly with the shoe-player interface. Here we must consider tape, wraps, socks, arches, heel cups, and other orthotics. There are two general principles that apply to this area. Most important, alteration of the shoe-player interface requires some rationale into the implementation of the modalities mentioned. There are specific indications and contraindications for the various types of adhesive ankle and foot strappings, which is also true of the other foot orthotics. However, a detailed discussion in this area is beyond the scope of this transmission. Also alterations and modifications in the shoe-player interface must also be made to fit properly. They should not constrict or irritate the foot.

As the saying goes, "if the shoe fits, wear it!" We hope, however, that those responsible for purchasing and outfitting footwear for the athlete will also consider

those factors that relate to safety, economy, and performance.

1. Torg, Joseph S. and Quedenfeld, Theodore C.: "Effect of Shoe Type and Cleat Length on the Incidence and Severity of Knee Injuries Among Philadelphia High School Football Players." *Res. Quart.* [*A.A.H.P.E.R.*] 42: 203-211, 1971.
2. Torg, Joseph S., Quedenfeld, Theodore C. and Landau, Steven: "The Shoe-Surface Interface and Its Relationship to Football Knee Injuries." *J. Sports Med.* 2:261-268, 1974.
3. Torg, Joseph S., Quedenfeld, Theodore C. and Hayken, Gerald D.: "The Shoe-Surface Interface: Supplental Determinations." *J. Sports Med.* 2:268-269, 1974.

* * * *

CONGENITAL, DEVELOPMENTAL, AND STATIC DEFORMITIES OF THE FOOT: HOW THEY AFFECT ATHLETIC PERFORMANCE

Joseph S. Torg, M.D.

The certified Athletic Trainer is, or should be, well versed in the recognition and emergency management of sprains, strains, contusions, fractures, and other traumatic problems of the foot. The purpose of this paper is to provide insight into those groups of disorders which are congenital, developmental, or static in nature. These disorders differ from the sprains, strains, etc., in that they are not primarily of traumatic origin. Congenital problems are those present at birth and are due to some aberration occurring during intra-uterine development. Developmental deformities occur subsequent to birth and usually involve an abnormality of one of more of the various bony growth centers. Static deformities of the foot are those manifested in abnormal posture and may be either a variation of normal development or the result of some underlying pathology. Many of the problems to be discussed will be seen only infrequently by the athletic trainer. However, many others will be frequently encountered and, we hope, recognized and appropriately managed.

From the standpoint of functional anatomy, the human foot is an extremely complex device. It consists of twenty-seven bones joined together by fifty-four joints, powered by a number of extrinsic and intrinsic musculotendinous units. For the purposes of this discussion, the foot wil be resolved into three structural units: the hindfoot, the midfoot, and the forefoot. The hindfoot consists of two bones: the talus and os calcis. The large tendo Archillis of the powerful gastrocnemius-soleus muscle group attaches to the calcaneus, through which is mediated the force for plantar-flexion, a force necessary for walking and running. The midfoot consists of five bones: the cuboid, the navicular, and three cuneiforms. This unit is the keystone of the longitudinal arch of the foot. The third structural component, the forefoot, consists of the five metatarsals and fourteen phalanges. In the running gait, contact with the surface is mediated through the forefoot.

CONGENITAL DEFORMITIES

The most blatant congenital deformity of the foot is that of a congenital amputation. The amputation may involve any part or all of the foot, as well as a portion of the lower extremity.

Case I

Fifteen-year-old female sustained an injury to her right knee while skiing. In course of examination, there was observed to be a congenital amputation of the forefoot of the involved extremity (Fig. 1). Inquiries aimed at eliciting

Fig. 1

Fig. 1: Congenital forefoot amputation in a 15-year-old-female who skies and plays on her school basketball, baseball, and field hockey teams without difficulty.

information regarding the young lady's foot problem elicited the response "what foot problem?" In addition to being a proficient skier, she also played basketball, baseball, and field hockey on her high school team. The young woman stated that she required no special footwear and simply stuffed the front part of her shoe with cotton. She denied any difficulty with running or performing in her various activities.

The fact that congenital amputation of part of the foot did not preclude participation in competitive athletics is further reinforced by the knowlege that the National Football League record for the longest field goal kicked (63 yards) is held by an individual with such a lesion.

A more extreme situation would be either a congenital or a traumatic amputation that involved the entire foot and part of the leg, the so-called below-knee amputation. Hamilton (1) recommends that individuals with below-knee amputation and properly fitted in the appropriate prosthesis should be encouraged to participate in football fencing, wrestling, field events, golf, tennis, and baseball. He notes that participation in soccer, swimming, gymnastics, and basketball is equivocal with below-knee amputation. The only activity designated as difficult or impossible for the below-knee amputee is track. The point is that the coach or trainer confronted with an individual with a significant congenital deformity should not be overwhelmed. By and large, most of these individuals will do fairly well without too much concern.

Congenital clubfoot is a significant deformity that is seen with decreasing frequency because of early initiation of orthopedic treatment. It is easily recognized because of the short heel cord, high-contracted arch, and marked forefoot adduction (Fig. 2, A & B). Also, the clubfoot is shorter than its normal pair, and the first digit, or large toe, is significantly shorter than the second digit.

Fig. 2 (A)

Fig. 2 (B)

Fig. 2A & 2B: Lateral and medial views of congenital clubfoot of a 14-year-old male C.Y.O basketball player. Characteristic deformities included short heel cord with equinus contracture, high contracted arch, and forefoot adduction.

Case II

Fourteen-year-old made was seen in orthopedic clinic to evaluate pain that he was having in his right foot. Examination revealed a classic club-footed deformity. Pain was localized to the base of the fifth metatarsal. The young fellow stated that he had been quite active in a Catholic Youth Organization basketball program, where he played wearing a short-leg brace. More recently, however, the pain in his foot prevented him from playing. Roentgenographic examination revealed a stress fracture involving the base of the fifth metatarsal.

As we shall subsequently see in our discussion of static deformities, a stress fracture of a metatarsal is, in an individual with a short heel cord, a predictable lesion. Of course, appropriate measures should be initiated to prevent its occurrence. However, the point being made in this instance is that, generally speaking, in instances of a congenital foot abnormality, it is the presence of pain only that precludes the individual from participating in athletic activity.

DEVELOPMENTAL PROBLEMS

For the purposes of this discussion, we will include under developmental problems of the foot those abnormalities that occur during, and are related to, bone growth and development. Generally speaking, they manifest themselves by causing pain, and the diagnosis will be made on the basis of roentgenographic findings.

Loss of the blood supply to the growing bone results in bone death and subsequent aseptic necrosis. Such a sequence is thought to occur in the tarsal navicular and is referred to as Kohler's

disease. The disorder occurs in pre-adolescent children, manifests itself by increased sclerosis of the bone on x-ray, and usually responds to conservative management such as cast immobilization and subsequent restriction of activity. In older individuals, this sequence of events if recognized to occur in the growth area (epiphysis) located at the distal end of the second metatarsal. Here, the eponym Freiberg's infraction is applied. Again, the disorder manifests itself with pain; however, subsequent deformity of the articular surface of the second metatarsal head may eventually require surgical removal of that part (Fig. 3).

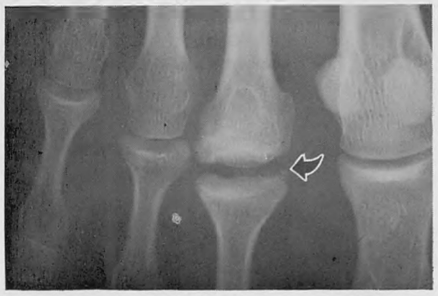


Fig. 3

Fig. 3: Residual deformity of second metatarsal head associated with arthritic changes in metatarsal-phalangeal joint represent late stage of Freiberg's infraction [aseptic necrosis of metatarsal head].

A painful condition involving the growth area (apophysis) of the os calcis has been termed Sever's disease. It occurs in early adolescence and, although self-limited in nature, may follow a protracted course over many months. X-rays may demonstrate increased density of the calcaneal apophysis (Fig. 4);

Fig. 4

Fig. 4: Increased radio-density of calcaneal apophysis frequently observed in Sever's disease.

however, it is doubtful that this is due to true osteosclerosis. Mangement of individuals with Sever's disease includes outfitting them with the commercially available plastic heel cups and limiting their activities as determined by their degree of pain and discomfort.

Worthy of mention at this point is the vexing heel spur. Hardly to be considered a developmental problem, the heel spur occurs in the more mature athlete. The individual is bothered by pain in the plantar aspect of the heel, associated with activity. This pain can also be elicited by applying pressure to the plantar aspect of the bone. X-rays may or may not demonstrate a bony projection on the antero-inferior aspect of the os calcis (Fig. 5). In all probability,

Fig. 5

Fig. 5: Heel spur demonstrated radiographically.

the discomfort is due to a degenerative inflammation of the plantar fascia at its point of insertion into the os calcis. We have had considerable success in treating plantar spurs with the plastic heel cup.

A tarsal coalition is a developmental abnormality of significant consequent. By "coalition" we refer to the actual bony bridging between one or more of the bones of the hind-and/or midfoot. There results an aberration in the mechanics of the foot, resulting in arthritic changes, pain, protective muscle spasm, and the peroneal spastic flatfoot deformity.

Occasionally, an athlete will sustain a injury to an ankle joint that is initially diagnosed as a sprain. However, pain and discomfort in the joint persists despite appropriate treatment and rehabilitation. Subsequent x-rays demonstrate an area of osteochrondritis dissecans involving the dome of the talus, thus explaining the clinical course (Fig. 6).

Fig. 6

Fig. 6: Typical appearance of osteochondritis dessicans involving the upper right hand margin of the dome of the talis in a college athlete who had protracted pain following mild ankle injury. Lesion must be differentiated from nonunion of marginal fracture.

STATIC DEFORMITIES

Static deformities of the foot are those that manifest themselves primarily by variations in posture, e.g., toeing in, flat feet, or high arch. These postural variations may be either variations of normal development or pathologic in nature. The most common postural problems involving the feet and lower extremities seen in growing children and adolescents are those associated with "toeing in" and "toeing out." As already indicated, toeing in may well be a variation of normal growth and development, or may be due to some abnormality. If toeing in is secondary to an abnormal condition, it may or may not be of significance as far as participation in athletics is concerned. Also, toeing in as well as toeing out may occur from variations in the femur or tibia, as well as the foot per se. Thus, evaluation of the individual who toes in or toes out should begin with an examination of the range of motion at the hip. The patient is placed on his back, and the hip and knee are flexed 90 . The femur is then rotated inwardly to its maximal excursion and outwardly to its maximal excursion. In the "normal" individual, the hip will rotate through 90° of motion, 45° inwardly and 45° outwardly from the neutral position. If there is an excess of either inward or outward femoral torsion, there will be either more inward or more outward rotation. Thus, individuals with excessive inward femoral torsion will tend to maintain the attitude of the lower extremities midway between the extremes of motion and thus will toe in secondary to the inwardly rotated femur. Conversely, individuals with excessive outward femoral torsion will maintain their lower extremities in a position midway between the extremes of motion and then will toe outwardly. Both inward and outward femoral torsion are considered to be variations of normal development and are of no consequence to the athlete.

Another common cause for toeing in is inward tibial torsion. With the patient lying flat on his back and his kneecap pointing straight towards the ceiling, the medial malleolus should fall well anterior in its relationship to the lateral malleolus at the ankle. With inward inclination of the tibia, the lateral malleolus will be on the same plane with the medial malleolus, thus substantiating the diagnosis of inward tibial torsion. Again, this condition, responsible for toeing in, is considered to be a variation of normal development.

The most common cause of toeing in originating in the foot is due to forefoot adduction, the so-called skewfoot. Although forefoot adduction is abnormal, it rarely causes problems as far as participation in athletics is concerned, other than occasionally to interfere with proper fitting of shoes.

As already indicated, toeing out may be caused by excessive external femoral torsion. Rarely do we see excessive external tibial torsion. The most common causes for toeing out are found to be due to the various causes of the flat or pronated foot.

Flat feet (pes planus) can be categorized as either first degree, second degree, or third degree. When examining a foot, it should always be first looked at in the weight-bearing position. Then the foot should be examined without weight-bearing, with the patient sitting on a table. Lastly, the individual should be instructed to stand on his tiptoes so as to actively form the longitudinal arch.

A first degree flatfoot is one that is flat on weight-bearing, but with passively forms an arch when unweight. With one exception, such a foor is of little of no significance. The second degree flatfoot remains flat when unweighted, but can actively form an arch when the patient stands on his tiptoes. Again, this type of

foot is considered to be of little, if any significance. The foot that remains flat in all three positions is designated the third degree flatfoot. Such a foot should be considered a potential problem, particularly if there is associated pain. There is usually an underlying aberration of the structural architecture and mechanics of the foot, warranting further investigation. We have already mentioned the peroneal spastic flatfoot, which is third degree in nature, the underlying problem being that of a tarsal coalition.

The most commonly unrecognized and yet potentially serious, problem affecting the foot in the athlete is the short heel cord. Normally, motion at the tibiotalar joint is such as to permit the foot to come at least 15-20° above neutral. Not infrequently, we see what are considered to be normal athletes whose motion is limited at, or less than, neutral. We feel that such individuals can be considered to have a short heel cord. It must be emphasized that, in examining for motion at the ankle joint, it is necessary to lock the subtalar and midtarsal joints, so as not to swing about the talus, getting a false impression of the true motion. This true motion may be achieved by inverting the foot prior to determining the degree of doriflexion.

Case III

R.Y., an 18-year-old high school student, was evaluated becaue of "on-and-off foot pain for eight months." The pain in his foot began insidiously at the end of first week of cross-country practice in his senior year of high school. X-rays taken at that time were negative, and he was told that he had "foot strain." He was unable to continue his cross-country activities, despite application of an arch pad into his shoe. The pain recurred while playing intramural basketball. Re-x-ray at that time demonstrated a stress fracture at the base of his 5th metatarsal. No specific treatment was initiated other than having been told to "take it easy." Attempts to play tennis eight months after the initial onset of symptoms produced pain in the lateral aspect of his foot that was disabling. Examination revealed tenderness over the base of the 5th metatarsal. Patient was unable to bear weight without extreme discomfort. Of significance was the fact that ankle motion was limited at -15 plantar flexion bilaterally (Fig. 7). This was attributed

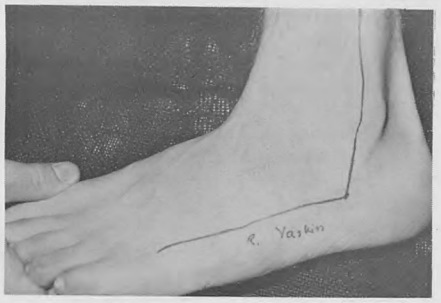


Fig. 7

Fig. 7: Short heel cord prevents foot from dorsiflexing past minus 15 degrees. this restriction on ankle motion increases stress on forefoot during toe-off phase of gait.

to short heel cords. X-rays demonstrated delayed union of a stress fracture through the proximal aspect of the 5th metatarsal (Fig. 8). The fracture did not heal, despite six weeks' immobilization in a plaster of paris cast. Healing was finally effected following an inlaid bone graft across the fracture site.

Fig. 8

Fig. 8: Delayed union of a stress fracture of the fifth metatarsal occurred in a distant runner with a short heel cord who was not initially treated.

This particular problem case illustrated several interesting aspects of the problem. There is the classic history of an individual who has been relatively inactive developing discomfort after vigorous athletic activity. Initial roentgenograms were interpreted as negative, which is characteristic in the early stages of a stress fracture. Several months later, when the symptoms recurred with activity and the proper diagnosis was made with roentgenographic assistance, the unfortunate assumption was made that the lesion would heal without treatment. Yet, the lesion went on to develop into a delayed union.

However, of utmost significance in this case was the inability of the patient's foot either passively or actively to dorsiflex above -15° plantar flexion with the foot inverted. Due to the short tendo Archillis prohibiting full excursion of tibiotalar (ankle joint) motion, excessive stress was placed on the metatarsals in the toe-off phase of gait.

The findings of a short heel cord associated with ill-defined or poorly explained pain and discomfort in the foot following physical activity should alert the examiner to suspect the existence of a stress fracture. Roentgenograms taken two or three weeks after the onset of symptoms will demonstrate a fracture or periosteal elevation at the stress area. Although many of these lesions may well go on and heal without vigorous treatment, the experience of this case demonstrates one instance of the inappropriateness of expectant treatment.

Bunions (hallux valgus deformity) are generally thought to occur in little old ladies. However, there is a condition that occurs in adolescents, referred to as metatarsus primus varus deformity (Fig. 9) in which a painful bunion can form over the first metatarsophalangeal joint. In the athlete, it certainly seems more reasonable to cut the shoe rather than the bone to relieve the source of pressure, subsequent bunion formation, and pain.

Fig. 9.

Fig. 9: Metatarsus primus varus deformity in a 15-year-old female soccer player. note medial angulation [varus] of first metatarsal and lateral angulation [valgus] of toe, causing prominence of metatarsal-phalangeal joint.

Another condition commonly associated with little old ladies is that of hammer toe deformity.

Case IV

A.P. is a 27-year-old professional soccer play who reported for preseason physical examination. During the course of the examination, it was observed that he had marked hammer toe deformities of digits two through five of both feet (Fig. 10). There was also significant callus

Fig. 10.

Fig. 10: Hammer-toe deformities.

formation over the proximal interphalangeal joints of the 4th and 5th digits bilaterally. The player denied having or ever having had any symptoms referrable to his feet. During the course of the season, he started and played the entirety of every game. Also, he made the league all-star team and was second highest scorer in the league.

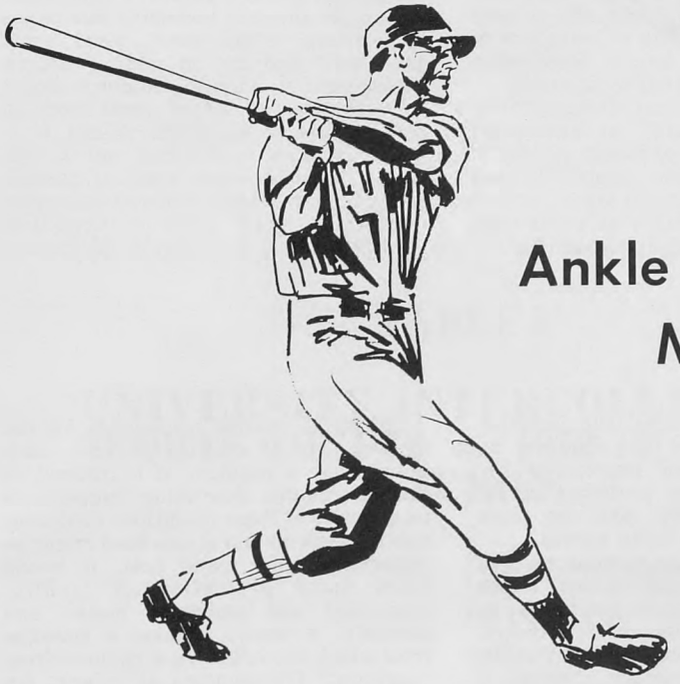
Regarding the effect that hammer toe deformity has on athletic performance, I think that this case speaks for itself.

SUMMARY

Several of the more common congenital, developmental, and static deformities of the foot have been briefly discussed. In general, it can be said that unless a particular lesion is painful in nature, its effect on athletic performance in all probability will be negligible.

1. Hamilton, Robert C.: "The Juvenile Amputee in Athletics." *Inter-Clinic Information Bulletin, VI:* 1-25, 1966.

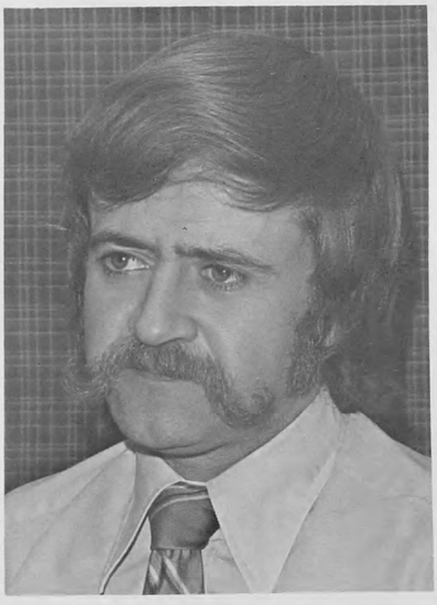
* * * *



1974 SCHERING SYMPOSIUM

Ankle Injuries: Frequency and Mechanism of Injury

James G. Garrick, M.D.



James G. Garrick, M.D.

Head and neck injuries are the most frequent cause of death in sports. Knee injuries most frequently result in operative procedures in athletics. Ankle injuries simply occur most frequently.

Ankle injuries plague participants in every sport. Although some sports, such as swimming, result in few ankle injuries during actual participation, ankle injuries can occur during training and conditioning and, once present, can seriously affect performance.

Other than their almost universal presence, ankle injuries present some other unique features: not only are more then three quarters of ankle injuries sprains, better than three quarters of these sprains involve a common structure - the anterior talofibular ligament. Contrast this to the situation regarding knee injuries where the menisci, the medial collateral ligament, the anterior cruciate ligament and the extensor mechanism are all injured with appreciable frequency.

Mechanisms

In spite of the fact that the majority of ankle injuries in athletics are inversion sprains, there still exists some sport specificity with regard to the mechamism of injury and the type of ankle trauma.

Any sport that involves running carries with it the risk of inversion sprains. Due to the bony architecture of the ankle and a shorter malleolus medially, inversion occurs more readily than eversion. Thus, sprains involving the lateral structures of the ankle are common in football, basketball, baseball, tennis and even in trach. Add cutting to the running activities and the frequency increases, e.g., football, tennis, soccer, baseball. Cutting maneuvers increase the frequency of inversion sprains because the step initiating the cut for the turn is from the foot contralateral, or opposite, to the direction of the turn. For example, a cut to the left begins with a lateral push-off from the right foot, forcing the ankle into inversion external rotation and ultimately plantar flexion--the same motions that result in the classic inversion ankle sprain.

If the holding force, or traction at the shoe-surface interface is excessive, then the foot may not release after initiating

the cut and injury may result. This reaction would explain the increased frequency of ankle sprains in football when playing with seven ½-inch conical cleats, or when playing on Astro Turf. In some instances the resiliency of the playing surface is intimately related to its traction characteristics and thus might lead to ankle injuries. The newer wrestling mats, which provide excellent impact absorbtion, allow increased traction not only between the shoe and the mat's "skin" but also from the fact that the shoe actually indents the mat, thus discouraging foot release or rotation. Gymnasts forced to tumble or perform free exercise routines on wrestling mats frequently complain of their inability to twist or turn their feet on the surface.

A rough or uneven playing surface might also result in an increase in ankle sprains. The circumstance can arise in the case of ill-maintained natural turf football or soccer fields. Conversely, a properly maintained surface in some sports might even encourage ankle sprains. Consider the bases in baseball: stepping or turning on any base, save home plate, usually results in inversion of the ankle because the base is raised; is more yielding than the base path, and is usually stepped on by the runner's right foot (placing the runner arc inside rather than outside the base path, thus shortening it).

Surface irregularities can result not only from poor maintenance, or the placement of objects on a surface (e.g., bases in baseball, mats in gymnastics, etc.) but also from other participants. One of the more common mechanisms of ankle injury in basketball is coming down from a jump on someone else's foot, thus accentuating the ankle's normal tendency to go into inversion.

Sports Specific Injuries

Specific athletic activities and maneuvers also result in some less common foot and ankle injuries. The pointe or hyperplantar flexed position of the ankle assumed by ballerinas, gymnasts and some swimmers and divers can result in anterior capsular sprains, or, more commonly with ballerinas, symptoms resulting from the impingement posteriourly of the capsule, as trigonum or posterior process of the talus. Although these problems rarely occur acutely, they are no less debilitating than the acute sprain.

Many sports employ running up hills or stairs as a conditioning method. Acute Achilles and/or peroneal tendinitis is, therefore, not uncommon in rowers, football players or even wrestlers. The frequency of these particular problems if further increased when the hill or stair climbing is undertaken in flat or heelless shoes, especially if the participants are used to wearing the higher heeled shoes dictated by fashion for both men and women.

Footwear can be as significant a mitigator of foot and ankle injuries as the playing surface. Footwear for athletes has become as specific as the sports themselves. Because of this specificity, it can be dangerous as well as inappropriate to wear the wrong shoe for the wrong sport. The sprinter's "spikes" are certainly appropriate for those events in which the athlete "runs on his toes." The jogger attempting to use these shoes invites Achilles tendinitis and heel bruises. "Stone bruises" also can result from using basketball shoes (designed for use only on flat regular surfaces) for jogging on asphalt or gravel.

Using multiple-cleated, molded-sole, soccer-type shoes to play football on natural turf can well decrease ankle injuries by fifty per cent as compared to the seven-posted football shoe. (1) However, the use of these same "soccer-type shoes" on synthetic turf might well increase the frequency of ankle injuries.(2)

Finally, the upper of the shoe can play a role in the occurrence of foot and ankle injuries - not only can improper sizing result in blisters, corns and subungual hematomas but it can also increase the chance of incurring an ankle sprain as a result of the "running over" of the lateral sole of heel of the shoe.

The height of the shoe can also influence the frequency of ankle sprains. There is some evidence that the use of high-top shoes- at least, in basketball - will decrease the frequency of ankle sprains, especially in those individuals who have suffered frequent ankle sprains previously. (3)

Although anyone responsible for the medical care of athletes realizes ankle injuries are a problem, it is difficult to find information describing comparative frequencies of these conditions in various sports. Information of this kind might be valuable in two ways: first, it would allow some prediction of facility, equipment and personnel needs; and secondly, it would provide a baseline from which one might view changes from "ambient" frequencies of injury. An example of the former situation would be the ability to order an adhesive tape based on rate of usage per ankle sprain combined with the sports offered, and the frequency of ankle sprains in these sports. The latter use is important in that it might allow the early recognition of injury-causing circumstances such as the use of a "dangerous shoe" or an inappropriate training or conditioning program.

During the 1971-72 and 1972-73 competitive sports seasons, 424 university athletes from seven sports-sustained medical problems as a result of sports participation. All were seen first by an athletic trainer and later by the team physician. In most instances the injuries resulted in time loss (from practice or competition), although this was not true in every case. As injury - for the purposes of this comparison - was defined as "medical condition arising from participation in an intercollegiate sport resulting in decreased performance and requiring the services of a physician after having been screened by a certified athletic trainer." This group includes all time-loss injuries. An eight sport - college football - is included but with a slightly different definition of injury. In the case of football, the definition required time missed from practice sessions and/or competition. The football data encompasses a four-season experience.

Although a traditional definition of injury was not used, legitimate comparisons among sports are possible as "injury" was defined similarly for all sports with the exception of football, and injured athletes were all examined by the same athletic trainers and team physicians. Table I thus allows comparison of the relative frequency of ankle injuries in these sports.

Obviously injury rates (i.e., ankle

injuries per participant, per season) cannot be computed from this data because the frequency of occurrence of injuries varies from sport to sport. For example, although similar proportions of bseball and wrestling innuries involve the ankle, the likelihood of being injured is more than three times greater in wrestling than in baseball. Thus, the absolute number of ankle injuries would be three times higher for wrestling.

A similar investigation was carried out at the high-school level. Certified athletic trainers were placed in four representative high schools in the Seattle metropolitan area. They served as trainers for all male and female sports in these schools. In this capacity they examined all athletes with sport-related medical problems and made the decision as to whether "an injury" had occurred. An injury was defined as "any medical condition arising from sport participation causing the participant to be removed from a game or practice or resulting in a subsequent missed game or practice."

The data for the first year of the study in three sports has been analyzed and is presented in Table II. football and wrestling appear to have nearly identical over-all injury rates, but among the injures, ankle injuries are slightly more than twice as common in football. Basketball appears to have an over-all injury rate, i.e., less than half that seen in football or wrestling. However, the over-all rate of occurrence of ankle injury is more than three times greater than that seen in wrestling and nearly twice that seen in football, a result of the fact that nearly half of all basketball injuries involve the ankle. Thus, if one desires to study ankle injuries or indeed initiate programs to prevent ankle injuries, basketball would appear to be an excellent starting point.

The types of ankle injuries seen in these three sports were surprisingly similar in spite of the differences in the specific acitivities involved. Over eighty per cent of the injuries were sprains, the majority of which were of the inversion variety. There was some difference in the severity of the ankle sprains in the three sports, with football exhibiting a higher proportion of moderate and severe sprains as compared to the more frequent mile sprains in wrestling or basketball.

It must be borne in mind that the high-school data presented here represents no more than preliminary findings, and due to the small number of participants involved in some sports, no definite conclusions can or should be drawn. However, one cannot fail to note that the injury rates, as ascertained by certified trainers, are appreciably higher than those reported by other authors, nearly all of whom have depended on nonmedical personnel - coaches - for injury recognition. (4-6) Such reports suggest that an appreciable number of ankle injuries, as well as most other injury types, are frequently unrecognized at the high-school level. The unrecognizd, and thus untreated, ankle sprain may well result in inadequate healing and a subsequent predilection to further, similar injuries. Thus, injury recognition itself can play an appreciable role in subsequent injury prevention.

TABLE I

UNIVERSITY INTERCOLLEGIATE SPORTS [1971-72 & 1972-73] ANKLE INJURIES

Sport	[percentage of total injuries in each sport] Ankle Injuries
Crew	1.7
Gymnastics	5.8
Track & Field	8.7
Baseball	10.9
Wrestling	11.2
Tennis	14.3
Basketball	28.0
Football *	18.9

*Only time-loss injuries, average for 4 seasons.

TABLE II

HIGH-SCHOOL INTERSCHOLASTIC SPORTS [MALE]

1973-74

Sport	Participants	Injuries	Ankle Injuries
Football	309	265	33
Wrestling	115	105	6
Basketball	135	53	25

CONCLUSION

Ankle injuries represent an important problem in nearly every sport. Elucidation of the mechanisms involved in the production of these injuries will, in some instances, allow preventive measures to be employed. Such preventive measures, however, require a solid base of information, possible only by the thorough examination of injured athletes, and the circumstances surrounding their injuries, by trained medical personnel.

REFERENCES

1. Torg, J.S. "Effect of shoe type and cleat length on incidence and severity of knee injuries among high school football players." *Res. Quart.*, 42: 203-211, 1971.
2. Torg, J.S.; Quedenfeld, T.C., and Landau, S. "Shoe turf interface and its relationship to the incidence of football knee injuries." Presented at the *Twentieth Annual Meeting of the American College of Sports Medicine*, Seattle. May, 1973.
3. Garrick, J.G. and Requa, R.K. "Role of external support in the prevention of ankle sprains." *Med. Sci. Sports*, 5:200-203, 1973.
4. Robey, J.M.; Blyth, C.S., and Mueller, F.O. "Athletic injuries: Application of epidemiologic methods." *JAMA*, 217: 184-189, 1971.
5. Allman, F.L. "Problems in diagnosis and treatment of athletic injuries." *J. Louisiana Med. Soc.*, 117: 121-125, 1965.
6. Clark, D.M. "Some medical aspects of precollege sports for boys." Read before the *Sixth National Conference on the Medical Aspects of Sports*, Miami. 1964.

NATIONAL ATHLETIC TRAINERS' ASSOCIATION

BOARD OF DIRECTORS MEETING

MARCH 2-3, 1975

O'HARE INN

ROSEMONT, ILLINOIS

The Mid-Winter meeting of the Board of Directors of the National Athletic Trainers' Association was convened at the O'Hare Inn, Rosement, Illinois at 4:15 o'clock p.m. by Mr. Frank George, President, presiding and with the following present:

District I	Wesley Jordan
District 2	Francis J. Sheridan
District 3	Craig Lewellyn
District 4	Robert C. White
District 5	William W. Flentje
District 6	Eddie Lane
District 7	Warren H. Lee
District 8	Lewis C. Crowl
District 9	Eugene Smith
District 10	Richard Melhart
President	Frank George
Executive Director	Otho Davis

I. The meeting was opened with a prayer by Mr. George.

II. The Audio-Visual Aids Committee report was presented to the Board. The Schering-NATA slide script presentation on "The Foot in Athletics" is nearing completion and will be available to the membership in a short time. The A-V Committee is to be re-grouped for a better working arrangement. Chairman Gordon Stoddard is working on a bibliography of reference materials to be presented to the Board in June, 1975. The Schering Symposium will be held on Saturday, June 7th, 1975, beginning at approximately 2:00 p.m.

III. The Board of Directors discussed "special cases" being permitted to take the certification examination. A motion was made by Mr. Sheridan and seconded by Mr. Jordan to allow NATA members who did not qualify to take the certifying exam, to take the examination as a "special case" if they have ten years of experience as an athletic trainer; are Code No. 2 members of NATA as of January 1, 1973; meet the requirements of CPR and First Aid under Certification prior to the meeting of the Board of Directors through their District Director to the Executive Director and President; appear before the Board of Directors in person to present their individual case with the cut-off date being at the Boston convention in June, 1976, only to receive a review of said "special case" by the Board of Directors to make a recommendation to the Board of Certification to allow or disallow the individual consideration to take the certification examination.
ACTION: Affirmative - Districts 1, 2, 3, 4, and 10. President cast an AFFIRMATIVE vote to carry the motion.

IV. A motion was made by Mr. Lewellyn and seconded by Mr. Sheridan that a person taking the certification examination as a "special case" and fails the examination will not be allowed to retake said exam.
ACTION: Affirmative - Districts 1, 2, 3, 4, 8, and 10. Negative - Zero. Abstained - Districts 5, 6, 7, and 9.

V. There was discussion in reference to having a full-time Executive Director. Dues increases were discussed. Mr. Lane stated that his district would not favor any dues increase. Mr. Davis stated that he "would like to go on record saying that I would be opposed to any dues increase in any classification" More discussion will follow in June.

VI. The Drug Education Committee report by John Wells was discussed. In light of the growing medical evidence indicating the harmful effects of tobacco smoke on non-smokers, Athletic Trainers should be examples of good health practices, the Drug Education Committee recommends that the Board of Directors of the National Athletic Trainers' Association prohibit smoking at clinical sessions of the NATA annual meetings.

A motion was made by Mr. White and seconded by Mr. Lewellyn to accept the above recommendation by the Drug Education meeting.
ACTION: Approved 9-1 (District 8 opposed).

VII. The Grants and Scholarship Committee report by Mr. Wiliam Newell was discussed. This committee asked for permission to inaugurate three undergraduate and professional study programs for minority groups on honoring outstanding students from the National Athletic Trainers' Association membership who have excelled academically and as student athletic trainers.

A motion was made by Mr. Lane and seconded by Mr. Flentje to deny the Grants and Scholarship Committee permission to inaugurate three study programs for minority groups as stated above.
ACTION: Approved 10-0 (Request Denied).

VIII. The Grants and Scholarship Committee re-submitted a request that the Board of Directors give consideration to an HONORS LUNCHEON that would be separate from and in addition to the present Honorary Membership and Awards Banquet.

A motion was made by Mr. Flentje and seconded by Mr. Lane to deny the above request.
ACTION: Approved 10-0 (Request Denied).

IX. The Grants and Scholarship Committee has applied for recognition of exemption as a publicly supported organization. NATA has been given a number for an advance ruling period ending May 31, 1975. The Grants and Scholarship Cmmittee will make an effort to meet the requirements of the applicable support test during this advanced ruling period that we may establish that we are a publicly supported organization and not a private foundation.

X. The Board of Directors recessed for dinner at seven-ten o'clock p.m. President George presiding.

XI. The meeting was reconvened at eight-thirty-five o'clock p.m., President George presiding.

XII. Mr. Sayers "Bud" Miller appeared before the Board of Directors to give the report of the Committee on Professional Education.

XIII. It was recommended that the Board of Directors of the NATA approve the following athletic training curriculums:
1. Springfield College
2. East Stroudsburg State College
3. Arizona State University
4. Pennsylvania State University
5. Stephen F. Austin State University

A motion was made by Mr. Sheridan and seconded by Mr. Lee to accept the above recommendations.
ACTION: Approved.

XIV. It was requested that the Board of Directors approve the withdrawal of approval from North Dakota State University's educational program in athletic training due to the change in the status of its program director. As soon as the school can indicate that its program director and head athletic trainer is certified, North Dakota State University may regain NATA approval of its program since the school does not have any other faults in its program.

A motion was made by Mr. Lane and seconded by Mr. Crowl to accept the above request.
ACTION: Approved.

XV. It was requested that the Board of Directors officially recognize the dropping of the approval of Purdue University's athletic training educational program offered through its Physical Education Department and that the last graduates from this program to be recognized by the NATA will be the members of the class of 1978.

A motion was made by Mr. White and seconded by Mr. Lee to accept the above request.
ACTION: Approved.

XVI. It was requested that Kerkor Kassabian's resignation from his position of Continuing Education Sub-Committee Chairman and membership on the Professional Education Committee be accepted by the Board of Directors.

A motion was made by Mr. Sheridan and seconded by Mr. Lewellyn to accept the above request.
ACTION: Approved.

XVII. It was requested that the following three persons be appointed to the Professional Education Committee:
1. Joanne Dolcemaschio, Brown University
2. Dennis Sealey, University of Nebraska
3. Richard Melhart, Washington State University

A motion was made by Mr. Sheridan and seconded by Mr. White to accept the above request.
ACTION: Approved.

XVIII. It was requested that the Board of Directors approve a one (1) year provisional approval of Mankato State College's Athletic Training educational program due to its present financial difficulties.

A motion was made by Mr. Lane and seconded by Mr. Lee to accept the above request.
ACTION: Approved.

XIX. At the request of President Frank George, Sayers "Bud" Miller, Committee Chairman, wrote the article "Continuing Education or Obsolescence in Athletic Training" which was published in the September 1974 Issue of *Athletic Training* (Volume 9, Number 3) in order to better inform the membership about continuing education and the requirements of the continuing education program developed by the NATA. To supplement this article, a questionnaire to determine the opinion of the NATA membership as to the feasibility of the NATA's continuing education program and to obtain raw data concerning the number of CEU's earned by various members of the NATA was published in the December 1974 Issue of *Athletic Training* (Volume 9, Number 4) along with President Frank George's editorial comments on the subject.

The first returns from this questionnaire indicate that 80 percent of the NATA membership feel that the NATA should require its members to meet a continuing education requirement in order to maintain certification. The remaining 20 percent of the ATA membership either replied negatively or had not made a decision on this subject. 67 percent of the NATA membership felt they would be able to obtain nine (9) continuing education units every three years. However, when listing the continuing education activities and units for the year of 1974, 76 percent of the NATA membership indicated the capability of obtaining nine (9) CEU's.

The most discouraging results being obtained in this questionnaire are that only 49 percent of the NATA membership felt they had received sufficient information on continuing education. At this time the Committee's only suggestion for improving on this lack of information would be for each District Director to call upon the member of the Professional Educaiton Committee in his district to speak to the District membership at the next District meeting explaining the continuing education program that has been developed, reassuring those present that these requirements including the 9 CEU's in a three year period requirement have not become a hard and fast set of rules, and pointing out that this year's collection of data is only for the pilot study being carried out by the Professional Education Committee to obtain some idea how workable this program and its individual requirements will be.

XX. Following a lengthy discussion on Continuing Education, it was requested that the Board of Directors approve the following revisions in the wording of the Continuing Education Program:

1. Page 2, Section IIA; IIB; IIC; IID; and IIE should have the following statement added to the end of each section: (1 contact hour equals .1 CEU).
2. Page 2, Section II: It should have the title changed to read as follows: *Teaching of Athletic Training Courses.*
3. Page 3, Section II: It should be changed to read as follows: *Student Trainer Supervision*: One (1) CEU per year will be awarded for supervision of a student trainer program for a full academic year. If more than one athletic trainer (certified or associate) is supervising a student trainer program, each receives equal credit.

A motion was made by Mr. Lee and seconded by Mr. Sheridan to accept the above revisions.
ACTION: Approved.

XXI. The National Association for Sports and Physical Education and NATA's Cosponsored Athletic Trainers Council was discussed.

In regards to providing more opportunity for our NATA membership to attend or participate in NATA endorsed educational programs, it has been agreed that an athletic training workshop will be held in conjunction with each of the AAHPER's district conferences for secondary school athletic directors. The Committee member in whose district this conference is being held will be called upon to organize the athletic training workshop. It has also been agreed that one session of each of the secondary school athletic director's conferences will be devoted to athletic training, therefore, giving us the opportunity to inform these administrators of our programs to provide each school with a teacher-athletic trainer that is certified by the NATA.

XXII. The Third Annual Educational Workshop at the NATA Annual Meeting was discussed. The Third Annual Educational Workshop developed by the Professional Education Committee will be held on Saturday morning, June 7, 1975, at Anaheim, California, at the NATA Annual Meeting. The topic will be "Functional Anatomy of the Knee." The instructor was scheduled to be Dr. Martin Blazina. However, Dr. Blazina will not be able to participate due to schedule conflicts. Bill Chambers is in the process of obtaining another capable instructor as a replacement.

XXIII. The Athletic Training Curriculum Directors Council Meeting was discussed. At the NATA Annual Meeting in Anaheim, California a meeting has also been scheduled for all athletic trainers involved in either directing or developing an athletic training curriculum. The primary function of this meeting is to provide an exchange of ideas that hopefully will improve the quality of the educational experience for students professionally preparing for a career in the field of athletic training. This meeting will be held on Monday, June 9, 1975 from 1:00 p.m. to 3:00 p.m.

XXIV. The Professional Education Committee's educational display was exhibited at the A.M.A.'s Clinical Convention in Portland, Oregon and will be exhibited as a part of the Athletic Training Drop-In Center for Women at the AAHPER Annual Convention to be held in Atlantic City. It is hoped that copies of the display can be developed so that it may be exhibited in many other parts of the country. The feasibility of this suggestion is being studied. Bill Chambers is also studying the feasibility of exhibiting this display at the NATA Annual Meeting in Anaheim. In addition, if space is available, an area will be reserved for the Professional Education Committee to answer questions of the NATA membership on issues or questions concerned with Athletic Training education. A member of the Committee will be available at this location at all time.This procedure may help to eliminate any communication gap that may exist between the Committee and the NATA membership.

XXV. Certificates for Undergraduate Curriculum Graduates were discussed. Gary Delforge displayed a copy of the proposed certificate for undergraduate curriculum graduates at the Committee's Pittsburgh Meeting and will have a supply of these certificates printed and available for program directors to issue to their graduates this Spring.

XXVI. Clinical Experience of Students Enrolled in Athletic Training Curriculums was discussed. One of the most perplexing problems facing the Committee has been the type, quality and quantity of clinical experience that students enrolled in our NATA approved schools are receiving. At present, our graduates from NATA approved schools have not scored well on the oral-practical portion of the NATA certification examination in comparison with the other procedures of certification. However, the lack of sufficient numbers of graduates from each school taking the certification examination has kept the Committee from definitely locating individual school weaknesses in the area of clinical experience. Therefore, the Committee has had to look at this problem from a general overview of the situation. In trying to draft a more specific set of guidelines for the clinical experience, the following areas of concern must be considered:

A) Clinical experience for female students
1. Should they have clinical experience with male athletes and sports, more specifically football?
2. Should clinical experience be required in a coeducational training room?
3. If clinical experience for female students should be limited to female sports, if 600 clock hours too great a requirement when opportunities for clinical experience are quite limites?

B) Should all clinical experience (600 clock hours) be under the direct supervision of a certified athletic trainer or can some portion of the clinical experience be under the indirect supervision of the certified athletic trainer? Should this be the decision of the clinical supervisor in each individual case?

C) Should all students be required to have experience with football? In what other sports should students be required to have clinical experience? How much and what type of experience should be required with each sport?

D) Should local high schools be used in trying to provide expanded clinical experience for students? Should the high school be required to have a certified athletic trainer to act as the supervisor? Can the student be placed in a high school setting after a to-be-determined number of hours of direct supervision and under the indirect supervision of a college supervisor? Should the high school be required to sign a contractual agreement that in a to-be-determined number of years the school will have to hire a certified athletic trainer so that they don't become reliant on college students to handle the athletic training duties and responsibilities at the school?

These are only examples of the problems that the Committee faces in developing guidelines for the clinical experience. Attached you will find a recommended draft of a policy concerning clinical experience as developed by Gary Delforge. Because of the lack of time at our Pittsburgh meeting, the Committee was unable to discuss and develop a final statement on this matter.

XXVII. The Professional Advancement Conference planned for May 1975 was discussed. The aforementioned item of business brings up the overall problem that the Professional Education Committee is facing. Today, our two day meetings held twice a year are just not sufficient to develop specific guidelines and educational goals of the NATA for any period of time. Presently, our time is consumed with curriculum aprovals, which takes approximately one day at each meeting and reacting to problems created by insufficient guidelines to follow. It is impossible for this Committee to answer the questions "Where is the NATA going with all these educaitonal programs and plans?" We do not have a master plan to guide us in our important educational decisions. The airplane pilot and the ship captain do not take off or set sail without a navigational plan to follow. They do everything to minimize the possibility of crash. We should do the very same thing. Therefore, we feel that the five day Professional Advancement Conference scheduled to be held in late May is a definite requirement of our Committee. We need to place undergraduate education, graduate educaiton, continuing education, course content, high school faculty instructional programs, clinics and workshops, the students clinical experience, onsite visitations, etc. into a 5 or 10 year master plan of athletic training education for the NATA. At present, Johnson & Johnson is willing to spend some of their monies reserved for the Berkshire Sports Medicine Program to being the Professional Education Committee together for a meeting. Of course, they would like to have us to spend considerable time in further developing the course content and other mechanics of the high school faculty instructional program. We would want to do this. However, we would like to fit this work into our master plan for the education of athletic trainers. Therefore, if Johnson & Johnson is not willing to support the entire conference, we would like to have the Board commit financial support for that portion of the conference that Johnson & Johnson and Berkshire Sports Medicine Institute is not willing to support. This probably would include only room and board expenses.

XXVII. It was requested that the Board of Directors commit financial support to the Professional Advancement Conference if this type of support is needed in assuring the success of this important meeting.

A motion was made by Mr. Land and seconded by Mr. Lee to approve the above request.
ACTION: Approved.

XXIX. The High School Faculty Athletic Training Instructional Programs were discussed. Although approximately seven months ago the Committee looked at the State of North Carolina and the Berkshire Sports Medicine Institute educational programs for faculty-trainers with skepticism and as a possible threat to our NATA approved schools professionally preparing students for a career as a teacher-trainer, today the Committee feels that there is a place for this type of program. It is felt that the greatest need for this type of program is that it is an active approach to creating the teacher-trainer position at the high school level. Presently, the NATA support of programs professionally preparing students for a career as a teacher-trainer, leading to the national certification of athletic trainers, and regulating the licensure of athletic trainers at the state level has been accepted rather passively by school administrtors. In other words, the NATA has made every effort to produce a highly qualified teacher-trainer for schools at the secondary level but school administrators have not created a position for this individual. At the same time all contacts with school and athletic administrators made by various members of the Committee has indicated a very great enthusiasm for this type of faculty instructional program.

It is the feeling of the Professional Education Committee that if faculty instructional programs supported by the various states are very receptable to school administrators, we should get in the act and help in the development of these educational programs in line with our present educational programs and certification standards. After all, this program does not stray from the premise that faculty members make up the major manpower pool in the high school setting to serve in the role of the athletic trainer. In this case we are just taking the teacher with an established position and "educating" this individual.

Today, when so many other para-medical and medical groups are trying to sell the idea that they can provide the athlete with the proper health and medical care, the NATA should keep on top of all these activities. In the case of the faculty instructional programs, it is felt that these programs are only temporary for a period of 5 to 10 years and will stimulate the development of the position of athletic trainer at the high school level. After this period of time, graduates from our NATA approved schools could fill positions that are not filled and available due to attrition. At the same time the faculty instructional programs could be converted to provide continuing education programs for the athletic trainer.

Therefore, after lengthy discussion at our Pittsburgh meeting, the Professional Education Committee has developed the attached preliminary statement offering guidelines to those individuals and agencies desiring to develop a high school faculty athletic training instructional program to meet in order to receive NATA approval and assistance. We refer to this statement as preliminary since a great deal more time will have to be applied to this program to such areas as course content before it will develop into a final document. However, we do feel that we have included the basic essentials in this preliminary statement and consequently, should be submitted for Board of Directors approval.

If the Board approves this statement developed by the Professional Education Committee, then the Committee strongly endorses the Berkshire Sports Medicine Institute educational program for faculty-trainers and asks the Board to give its endorsement too. We feel this endorsement is necessary since the Berkshire program has been developed within the guidelines and is constantly seeking NATA assistance in the development of their program.

XXX. It was requested that the Board of Directors approve the High School Faculty Athletic Training Instructional Program developed by the Professional Education Committee and that these programs be subject to annual review by the Board of Directors through the Professional Education Committee.

A motion was made by Mr. Lee and seconded by Mr. Melhart to accept the above request.

ACTION: Approved 8-0-2. Districts 8 and 9 abstained.

XXXI. It was requested that the Board of Directors endorse the Berkshire Sports Medicine Institute educational program for faculty-trainers since it has developed its program within the guidelines and standards established by the NATA and seeks to work cooperatively with the NATA in the development of specific content and detail of their program, subject to annual review.

A motion was made by Mr. Flentje and seconded by Mr. White to accept the above request.

ACTION: Approved 8-0-2. Districts 8 and 9 abtained.

XXXII. Mr. Miller gave a brief report on the NATA status of accreditation with Health, Education and Welfare.

XXXIII. President George gave a brief report on the NATA and the Forsythe Amendment.

XXXIV. Mr. Lindsy McLean appeared before the Board of Directors to present the report of the Certification Committee.

XXXV. A motion was made by Mr. Crowl and seconded by Mr. Lewellyn to have all certification candidates sign an honor statement after each examination that it is unethical to reproduce the written and oral practical questions in any way for the purpose of aiding other certification candidates in passing the examination.

ACTION: Approved 9-1. District 5 voted in the negative.

XXXVI. It was requested that the Board of Directors approve the following changes in the Procedures for Certification:

Under each of the five sections of the Procedures for Certification it is requested that the additional of the requirement of at least a current certification by the American Red Cross in basic first aid and a current (within the last year) certification by the American Heart Association of proficiency in cardio-pulminary recuscitation be required.

A motion was made by Mr. Jordan and seconded by Mr. Melhart to accept the above request.

ACTION: Approved.

XXXVII. It was requested that the wording under Section V of the Procedures for Certification be changed to that which follows:

"Any member who has passed an athletic training course and presents evidence of successful completion of an NATA approved workshop for credit or is showing satisfactory progress in an NATA faculty-trainer educational program and has satisfied the requirements for a state teaching license (or certification board approved equilivant) may be ENDORSED as a secondary school Athletic Trainer."

A motion was made by Mr. Jordan and seconded by Mr. Flentje to accept the above request.

ACTION: Approved.

XXXVIII. It was requested that the following three persons be added to the Certified Committee:

1. Richard F. Irvin, Oregon State University
2. Charles Krpata, San Francisco 49ers
3. Marjorie Altohm, Indiana University

A motion was made by Mr. Flentje and seconded by Mr. Lee to accept the above request.

ACTION: Approved.

XXXIX. The report of liaison representatives to allied organizations was presented to the Board of Directors, for those meetings which have met since June, 1974.

XL. Dr. Gray Delforge, NATA Representative to the American College of Sports Medicine reported on the developments since the 1974 ACSM meeting in Knoxville, Tennessee.

1. Recruitment of Certified Athletic Trainers for ACSM Membership.

Progress: As a member of the ACSM Membership Committee, your NATA representative mailed ACSM Membership recruitment materials and application forms to 100 Certified Athletic Trainers throughout the United States (see attached sample copy). This mailing was a direct consequence of the ACSM Membership Committee's desire to encourage and increase membership among athletic trainers.

To date, the effectiveness of this mailing in terms of new memberships has not been determined.

2. Assistance in development of mailing list for invitation of athletic trainers to 1975 ACSM Annual Meeting.

Progress: NATA Active and Certified Memberships lists for Districts 5, 6, and 9 were supplied to Dr. Merle Foss, ACSM Membership Committee Chairman, so that direct invitations could be extended to athletic trainers to attend the Annual ACSM Meeting in New Orleans, Louisiana, May 22-24, 1975.

3. Your NATA representative has been invited to attend the 1975 ACSM Annual Meeting in New Orleans.

XLI. Professor Karl K. Klein, American Corrective Therapy Association, had the following comments to share with President George, Mr. Davis, Executive Director, and Mr. Miller, Chairman of the Professional Education Committee:

January 22, 1975

Mr. Frank George, President
National Athletic Trainers Association

Mr. Otho Davis, Executive Director
National Athletic Trainers Association

Mr. Sayers Miller, Chairman
Professional Education Committee

Dear Sirs:

First the NATA must be highly congratulated for its effort to expand continuing education as part of the total education process of an athletic trainer. I have read with interest Bud Miller's article on continuing education and feel that the track has been set in a positive direction with the stipulation that the NATA possibly has the most progressive continuing education program of any of the Allied Health Science groups. This also, including the medical groups per se. In reviewing the recent article by Bud Miller in which the criteria was established for accumulating the 9 CEU points over a three year period makes me wonder whether or not many of the athletic trainers would be able to complete this progressive type of program in the stipulated time. As I have attempted to add up the points given for each of the various areas it would seem that the young person who is working on advanced degree might be able to accumulate his points quite easily with attendance at a few of the meetings and writing an article or two. Once he is part the advanced educational program then the potential of gaining the nine point requirement is going to be more and more difficult year by year. As I look at the total points that might possible be accumulated to meet the requirements it seems that it would keep a person quite busy throughout the year to accumulate the necessary percentages to maintin his certification in the field of Athletic Training. The points as I have been able to add them up comes to aboue 13 or 14 total which means that each and every member of the NATA is going to be diligently working not only at his position but also in the process of accumulating the points in order to maintain his certification.

As an associate member of the NATA for a number of years I have always been under the impression that this particular classification did not necessitate that the person be an athletic trainer and at the same time eligible to attend the meetings at no voting power. My interpretation of the professional membership classification is that of a person interested in the field of athletic training but not necessarily participating as an athletic trainer. It would seem to me that the associate membership should either be changed or another professional membership opportunity offered to those people who are interested and participating in some respect in athletic training. I believe the medical people who are members of the association have a profesional membership classification and I believe that this would at least leave this type of person free from meeting the high standards that have been established and still be able to maintain his membership and interest in the National Athletic Trainers Association.

As an interested person in Athletic Training and one who has participated in and at times has actually worked in the area of athletic training I feel that my contributions over the last number of years in presentation of papers and speaking ar various clinics throughout the country, not only in the athletic training group but other sports medicine groups, might make it possible for me to maintain my identity as an associate member but feel that it still might be difficult for myself to continue in this associate capacity under the present stipulations and that other associate members might run into the same difficulty in maintaining their associate membership classifications.

I realize that the NATA has made a progressive step forward in this whole concept of progressive education and realize that the same techniques are gradually being induced in other paramedical groups to keep the membership on their toes and up to date with new progress in the field. I also realize that the professional membership group may possible have to do some modification in the program and especially after they review the material that is being sent to them from the various members on the survey questionnaire found in the December 1974 issue. I am sure that the educational committee is going to review this material quite carefully and make further recommendations. I hope that the membership will submit the questionnaire that has been published in the December '74 Journal so that the education committee will receive basic information on how the membership feels concerning the total scope of the continuing education program as outlined in the September '74 issue of the Journal.

I am sure that some people probably have missed reading the article by Bud Miller in the September issue but after looking at the questionnaire and reviewing the article presented by Frank George in the December '74 issue that they will hurriedly go back and look at the work done by Miller to find out just where they stand and how they maintain their active membership in the association.

I hope that the NATA Board will consider the possibility of a classification of membership that would permit a person of my present position to continue to be actively involved with the NATA group and at the same time not to put the pressure for the extensive continued education that has been outlined. I believe that some modification of course will be the eventual outcome from the survey material received by the committee.

I noted in the educational article September '74 Area 2E in which scientific meetings by professional education groups where outlined that although they were all not included but certainly the osteopathic medical group of sports medicine meetings should be included and that also the American Corrective Therapy Association meetings should be included because they do have sections related to the problems of sports medicine.

Another matter concerned not related directly to that of the continuing education is the result of my reading the board of directories meeting June 7-11, 1974 in where reports for the liaison representation where given. I have noted that in past years, last few years anyway, the NATA had an official representative at the American Corrective Therapy Association meeting and previous reports have been carried in the board of directories meetings. This last one I noted the lack of an official representative being appointed to attend the American Corrective Therapy Association and lack of a report in the Board meetings concerning that liaison. I would like to ask if this liaison has been discontinued or whether it was a failure on the part of the liaison representative to make a report to the board meeting. I realize that the NATA was the first organization to appoint a liaison to the ACTA from any training group and that the ACTA had not reciprocated in this situation. I have been recommending that the ACTA have an official liaison to the NATA for the last number of years as I have been the active liaison between the two groups in relationship to community factors and interest. As a planned speaker for your Anaheim program this year I believe I will be appointed as official representative but if NATA has discontinued this practice then there would be no reason for my acting as an official representative to the NATA even though I will be speaking at their meeting. I still feel that there are many common factors between the NATA and ACTA in relationship to the preparation for people in the area of athletic training although in the past I have read the reports in the NATA board meetings which indicated that there was a lack of common factors between these two groups, I had at one time tried to find out from the NATA board who made such statements because I can understand how they might be brought up and how they might be misinterpreted as far as members of the NATA is concerned. If the NATA Board of Directories would look at the graduate programs in corrective therapy they would find that the qualification of the person in terms of diathetic courses taken would be as high as any of the other groups with which they are affiliated, the only problem would be that of meeting the supervision of the clinical training set-up as prescribed by the NATA. But this would only be a problem of future planning in order to prepare a corrective therapist with a masters degree to meet certification requirements for the NATA group. I hope that if and when I attend the Anaheim meeting that I might be able to speak to this point again at the board meeting and under such circumstances try to clarify the issues

in relationship to the educational process. Not that we are stating that the ACTA fully qualifies a person for athletic training but that the total diathetic program is extremely adequate with only the need for the clinical supervision under a certified trainer being needed to meet all of the requirements for NATA certification. I hope if you have a few spare moments you may respond to the latter part of my questions and seriously consider the membership classification that will permit a person in my particular situation to continue and be actively involved with the NATA as I feel it is an important part of the work that I have been doing over a number of years even though not actively participating on a year by year basis in the field of athletic training.

In finale I would like to congratulate the board of the NATA for approving and accepting the recommendations of the Executive Council of the Eastern Athletic Trainers Association in the board reports where the recommendation was made to support the cleating practices for football shoes as has been compiled from the numerous and various studies showing that the rear heel cleats and cleats over 3/8 of an inch are highly responsible for knee injury. If you will remember a few years ago, I think it was 1971 or 1972, that Allman, Davis, and Klein published an article in the NATA Journal in which all of the studies related to the cleating practices had been reviewed and definitely showed the trends that the heel cleats where a major problem of concern especially in the high school athlete. I am sure that the members of the Athletic Trainers Association are aware of the fact that New York State by mandate as a result of their studies have recommended to all high school athletic people playing in the federation of the state to change to the 3/8" cleat with the lock-on heel. It is unbelieveable that it has taken 20 years since Hanley first started his work and progressively has shown through his studies and the rest that have been compiled since that time that it is not until this date in time that the recommendations have been made by the NATA to follow the rules that have been set as a result of these studies. I am not criticizing the NATA for not taking this action before but because I am sure at this time they are the only official group, this includes all of the Para-medicals and medical fields that have not taken any stand in this direction to try to safe-guard the young athlete. In closing, I remain

Professor Karl K. Klein

XLII. Mr. Robert Gunn, NATA representative to the American Medical Association Committee on Medical Aspects of Sports submitted the following report:

To: Otho Davis, Executive Director-NATA
Frank George, President-NATA
Board of Directors-NATA

From: Robert Gunn, NATA Representative to AMA Contact Meeting of National Organizations intersted in Health and Safety Supervision of Sports - Sheraton Inn - Portland, Oregon, Firday, November 29, 1974.

The Contact Meeting was attended by the representatives of twenty organizations, which is a drop in attendance from the past few years.

Dr. Donald Erickson substituted for the deceased Dr. Richard Corbitt (for whom a memorial period of silent prayer was observed) and welcomed the representatives. He also had each representative stand, introduce himself and identify the organization he represented.

Following dinner, Dr. Donald Cooper showed a film on Drug Abuse, which of itself was a good film, but was primarily concerned with the use of "Hard" drugs such as heroin, L.S.D., cocaine, etc. and had very little emphasis on amphetimines, barbituiates, or anabolic steriods as related to athletes. There was very little of practical value to the trainer, from the standpoint of athletics, and abuse of drugs in athletics.

D.r Cooper then spoke on the subject of Drug Abuse in Athletics and Efforts for its control. He stated that, at present, no one has any idea about how great, or little, is the use and/or abuse of drugs in athletics today. There are no valid statistics available most information is rumor or heresay, and there is a reticence among the leaders in the sportsworld to fully and scientifically explore the problem.

Dr. J.G.P. Williams of Bucks, England, an invited guest, made some comments. He said he did not believe the American sports scene was as bad, drugwise, as it had been depicted. He questioned that drugs, per se, make that much difference (i.e. team sports) are controlled by *group* work, not particularly by individuals, plus the fact that if there is any obvious advantage being gained by drug taking individuals, the sport will *ban* the person or team, *or the drugs* in order to secure a controlled, or equal, situation. This is comparable to the banning of *illegal equipment* when it is found to give unnecessary advantage or is dangerous. If a *banned* drug is medically needed by an athlete, for healths sake, then he or she may usually obtain special permission from the governing bodies for its use. Dr. Williams stated a formula for control of drugs in athletics which he feels is workable.

1. Define - What Drugs Are To Be Banned
2. Detect - Abuse - Through Tests Which Are Valid
3. Disqualify - Athletes Found Guilty of Use
4. Deter - Athletes Will Not Use Banned Drugs If Their Opportunity To Compete Is Jeopardized

This formula may seem like oversimplification but it is basically sound if carried out by everyone, at every level of competition.

Finally, at 5:00 P.M. there were Consultation and Demonstrations. Sharon Kosek, Certified Atheltic Trainer, University of Washington, gave an excellent demonstration of taping and wrapping, which was very popular. Ms. Diane Huse, Nutritionist, discussed Diet Programs for Athletic, and Leo Marty, trainer, Portland State University, gave an excellent demonstration of "Evaluation of the Athletic with Suspected Head and Neck Injury." It was well done and informative.

In conclusion, I must state that, overall, this was a meeting that left one with very little feeling of accomplishment. I regret that the concept of the "Contact" Meeting is being discontinued, as it initially had a bright future. Maybe another organization (A.A.O.S.) will take up the reins and continue some type of interorganizational meeting on an annual basis. Some state medical associations are doing this, but not enough.

It was a pleasure serving the N.A.T.A. in this capacity.

Sincerely,
Robert H. Gunn
Certified Athletic Trainer

REPORT ON THE 16TH NATIONAL CONFERENCE ON THE MEDICAL ASPECTS OF SPORTS

NOVEMBER 30, 1974

Preceding the opening of the Conference there ws shown a good film, "Injury Prevention for the Athlete", filmed at the U.S.M.A., West Point, New York. The film is recommended for sowing at Trainers Clinics and Meetings. It highlights the screening of candidates for sports activities, for structural disabilities, prior to approval for participation. It also goes through rehabilitation techniques at West Point, and offers some excellent guidelines to follow before allowing an injured athlete to return to competition.

The Conference opened with the usual welcoming addresses, and a memorial period of silent prayer for the deceased Dr. Richard Corbitt.

I will not belabor this report with speech by speech comment, but will report on a discussion session held in the afternoon in which our Bud Miller participated. The subject of the discussion was, "Viable Alternatives for Health Care of the Athlete".

The first speaker, Florence Illing, R.N., spoke on "The Nurse as Assistant to the Team Physician". She surveyed, prior to her speech, 71 Directors of Health Services in colleges and universities throughout the U.S. She received 39 replies completed. The main item of interest presented to us, in this report, was that 89 percent (35 schools) that answered had Certified Athletic Trainers assigned to the Athletic Health Care team. 30 percent (12 schools) had full time physicians assigned to the Athletic Care team. 2.6 percent (1. school) had a Registered Nurse assigned to the Athletic Health Care team. Ms. Illing gave many reasons why the R.N. should be a part of the A.H.C. team and said that nurses can relieve trainers of many tedious duties he now assumed, thereby relieving him or her to concentrate more on athletic training. It seemed that, in her case at Memphis State, it is working.

The second speaker was Susan Massey, R.N., of Birmingham, Alabama, who is chairperson of Project H.E.L.P., Extension Learning Program. Her topic was "The Emergency Medical Technician as the principal Physicians Assistant in Athletic Programs". She has embarked on a program of clinics to teach EMTS (ambulance drivers) emergency health care in athletics. As she stated, Alabama is at the bottom of the barrel in athletic health care, with very few colleges having proper care by physical therapists or athletic trainers, and no high schools. She said that very few schools had team physicians. She began trying to get EMT's to have professional training in athletic health care in 1971, but had very little success. Finally, in February of 1974, the first course in emergency health care was offered, in Birmingham, for EMT's and coaches. It was a 2 1/2 day course , which was attended by approximately 300-400 coaches and EMT's. She felt that a 2 1/2 day course was sufficient initially, to qualify these people as "trainers".

The third speaker was "Bud" Miller of N.A.T.A. His topic was "The Athletic Trainer". Bud had a great presentation and gave an excellent paper. His time was cut short, due to the first two presenters going overtime with their papers, but he did an excellent job of presenting the Certified Athletic Trainer as a professional person qualified to carry out the duties these other people were talking about. It is a shame that his speech was not given in full session as it would have been one of the informative highlights of the whole Conference.

Following the discussion sessions the Conference reconvened in general session to hear Dr. Robert Larson speak on "The Patella of the Female Athlete". It was a good paper but frankly belonged with a session of the American Academy of Orthopedic Surgeons rather than in this Conference.

Following Dr. Williams talk there was very short discussion by the people present. No organization was asked to give even a brief summation of their efforts in behalf of control of drug abuse. There seemed to be an opinion of most people present that there was a decline in use of hard drugs, amphetemines, barbituates, and anabolic steroids, but an increase in the use of alcohol, tobacco, and marijuana.

Dr. Ken Clarke spoke briefly to the group on his efforts with NAIRS-Z, as a survey instrument on safety in sports.

Dr. Tim Craig announced that because of AMA's new accountability program or thrust, this will be the last Contact Meeting sponsored by AMA.

In summation, I was not particularly disappointed that this was to be the last Contact Meeting. In the past few years the Contact Meeting has seemed to have gotten away from its original intent, ie. an exchange of ideas, programs, thoughts, etc. among the people (organizations) present which might contribute to advances in safety in athletics. Granted that some of the earlier meetings got quite argumentive, and some verbal "firefights" took place, there was still a togetherness attempt at common problem solution.

There will be a *Conference on the Mental Health Aspects of Sports, Exercise and Recreation*, June 13-14, 1975 in Atlantic City, prior to the *Annual Convention*, AMA.

Starting with the *Clinical Convention in 1975* in Hawaii, the Committee on the Medical Aspects of Sports will initiate *Postgraduate Courses in Sports Medicine*, but will no longer hold a National Conference on the Medical Aspects of Sports in conjunction with the Clinical Convention, and no longer will hold a Contract Meeting.

A motion was made by Mr. Smith and seconded my Mr. Lane to accept the report by Mr. Gunn.
ACTION: Approved.

XLIII. Mr. Frank George, NATA representative to the American Physical Therapy Association presented the following liaison report:

Liaison Report of Frank George, Representative to the American Physical Therapy Association

This year the American Physical Therapy Association's annual meeting was held in conjunction with the World Confederation of Physical Therapy in Montreal, Canada. The House of Delegates of the APTA convened on June 14 and 15. The Sports Medicine Section met on June 16.

Some of the major issues presented to the APTA House of Delegates were the formation of three new sections -- Electromyograph, Orthopedics and Pediatrics. The formation of these three new sections was approved by the House of Delegates. A good deal of discussion concerned certification and specialization in different areas of physical therapy. A task force on specialization had been formed in June 1973. The report of this task force was presented to the House of Delegates. It seemed to be the general feeling of the House of Delegates that the APTA was not inclined toward certification of different Specialities in physical therapy.

The Sports Medicine Section met on Sunday, June 16. There were about 30 members in attendance at this meeting. Again a number of questions were directed to me regarding certification. How can a physical therapist become certified? How can a physical therapy student best work toward certification? How can physical therapy students do a clinical affiliation in an athletic training room? Also, I received a good number of inquiries concerning NATA approved graduate programs. The Sports Medicine Section will hold their Mid-Winter meeting in Dallas, Texas on March 20, 21, 22, 1975.

On Thursday, June 20, the World Confederation of Physical Therapy offered a concurrent session on Sports Medicine. This included lectures on:

Psychological Conditioning of Athletes
Concepts of Muscle Training

Psychology of the Female Athlete
Discussion on Methods of Athletic Training (Conditioning)
Overall Conception of Ligamentous Instability Around the Knee Joint
Discussion on Treatment of Knee Injuries

The 1975 APTA annual conference will be at Disneyland Hotel, Anaheim, California the week immediately following the NATA convention in the same hotel.

A motion was made by Mr. Lane and seconded by Mr. Flentje to accept the report by Mr. George.
ACTION: Approved.

XLIV. Ms. Holly Wilson, NATA representation to the National Association for Girls and Women in Sports (NAGWS or GWS) submitted the following report:

In October 1974, the N.A.T.A. was represented at the organizational meeting of the new Board of Directors of the National Association for Girls and Women in Sports (NAGWS or GWS).

At the meeting, I served in a dual capacity as the N.A.T.A.'s liaison and chairman of the GWS Special Committee on Athletic Training. The special committee was formed by GWS President Mildren Barnes in August. Its charge was to develop a plan through which GWS can improve the quality and quanitity of athletic trainers for girls' and women's sports and implement the plan following approval by the Board of Directors. It was hoped that the charge would be completed during 1974-1975; however, at the meeting the committee's original charge was expanded upon. The other members of the committee are Marge Albohm, Indiana University; Sherry Kosek, University of Washington; and Linda Treadway, West Chester State.

1. GWS Background Information

The National Association for Girls and Women in Sports is an Association within the Alliance Structure of the American Alliance for Health, Physical Education and Recreation (AAHPER). GWS was formed out of recognition for the need to develop, encourage, foster and support sports programs for girls and women. Presently there are over 9,000 AAHPER members who designated GWS as one of the Associations of their choice. There are eight substructures of GWS. They are:

a. Memberhship-at-large
b. Organization of NAGWS State Chairpersons
c. Affiliated Board of Officials
d. National Coaches Academies
e. Organizations with Club Sports, Intramurals or Sport Interest Focus
f. Organization for Sports Promotion at the Secondary Level
g. Association for Intercollegiate Athletics for Women (AIAW)
h. Organization of Students for Girls and Women in Sports

2. Purpose of the Meeting

The purpose of the organizational meeting was for members of the Board and chairpersons of both Special and Standing Committees to become acquainted and present their reports on plans for the upcoming year. Discussion was also focused on problems that were or might be encountered.

The GWS substructures that might be of some assistance to the N.A.T.A. are the Organization of NAGWS State Chairpersons, National Coaches Academics and Organization for Sports Promotion at the Secondary Level. Each of these substructures might be an avenue of communication in educating women physical education administrator, instructors and coaches about the role of the athletic trainer and thr prompt and proper care of athletic injuries. I talked with some of the chairpersons about this point during breaks. Most of them seemed receptive to athletic training. Of course, the Association for Intercollegiate Athletics for Women is another interest area, but the N.A.T.A. Ad Hoc Committee on Women in Athletic Training has asked for a liaison with the association.

3. National AAHPER Convention

The GWS is co-sponsoring three programs involving athletic training. They are:

A. A Drop-In Center where individuals can receive information on the athletic training curriculums and the care of specific injuries as well as view The Absent Link (Friday, March 14 to Tuesday, March 18)
B. A prelude to the National Conference on Injury Control in Girls and Women's Sports (Monday, March 17, 10:45-12:00)
C. A speech on Issues in Athletic Training (Monday, March 17, 1:45-3:00)

4. Reports of NAGWS - Cramer Products Co-Sponsored Summer Athletic Training Workshop for Women. Coordinator - Ms. Judy Devine, Kent State University.

1974 Summer Workshops in Athletic Training

A. Indiana State University, Terre Haute, Indiana
Coordinator: Holly Wilson
Staff:
Holly Wilson, Indiana State
Ray Baggett, Indiana State
Gail Weldon, Indiana State
Marge Albohm, Indiana University
Date: June 17-21
Number Enrolled: 18
Credit: 1 hour graduate or undergraduate

B. Madison College, Harrisonburg, Virginia
Coordinator: Leotus Morrison
Staff:
Mike Null, Madison College
Rod Compton, East Carolina University
Linda Hammett, Lake Braddock Schools
Date: June 24-28
Credit: 1 hour graduate or undergraduate
Number Enrolled: 28

C. California State University, Hayward, California
Coordinator: Dee Sciaraffa
Staff:
Don Cher, California State, Hayward
Dale Murray, Cabullo College
Eileen Noland, California State, Hayward
Marsha Teets, University of Arizona
Date: July 22-26
Number Enrolled: 40
Credit: Extension

D. Western Michigan University, Kalamazoo, Michigan
Coordinator: Billye Ann Cheatum
Staff:
Marge Albohm, Indiana University
Sue Schneider, Michigan State
Ken Kopke, Central Michigan
Dennis Aten, Eastern Illinois
Don Lowe, Kent State
Date: July 29-August 2
Number Enrolled: 64
Credit: 2 hours graduate or undergraduate

E. University of Wisconsin, Oshkosh, Wisconsin
Coordinator: Helen Briwa
Staff:
Holly Wilson, Indiana University
Gordon Stoddard, University of Wisconsin, Madison
Marge Albohm, Indiana University
Jerry Navert, University of Wisconsin, Oshkosh
Date: August 12-15
Number Enrolled: 40
Credit: 3 continuing education units or 2 undergraduate hours

In her report, Judy discussed some of the problems she had encountered or foresaw while coordinating the summer workshops.

5. Problems Encountered with Workshops -

Both the instructor's syllabus and the course outline for the 36 hour workshops needed to be revamped, and Judy reported they would be redone during the year. She suggested criteria for site selection and felt that bid form should be developed for institutions desiring to sponsor future workshops. The criteria are as follows:

A. Strong reputation in physical education
B. Ability to offer graduate or continuing education credit and undergraduate credit
C. On campus housing and dining facilities
D. Evidenced cooperation between men's athletic trainer and women's athletics
E. High degree of expressed enthusiasm for such a workshop

To expand national publicity, she recommended that a publicity brochure be devised and the workshops be advertised in JOHPER, UPDATE, NAGWS Newsletter and NAGWS enclosure to membership.

6. Problems Foreseen with GWS Coaches Clinics

Judy questioned the value of scheduling a 2 to 3 hour athletic training session during the four coaches clinics, which would be held in the fall (1974). She felt that women coaches would gain little understanding of basic theories in such a short period of time because of their limited backgrounds in athletic training.

Furthermore, she felt that the inclusion of such a session degraded the importance of athletic training to a position secondary to coaching, instead of equal to it.

I was asked my opinion, and stated that any informtion would be better than none. As long as clinicians covered basic information concerning the care and prevention of common injuries, the coaches would benefit. Coaches who must serve the dual role of coach-trainer must be taught basic training techniques until they can secure the services of a certified athletic trainer.

7. GWS Special Committee on Athletic Training

As a result of her concern, Judy recommended that a special committee be appointed to coordinate the GWS athletic training educational efforts. Since an athletic training committee already existed, the charge was expanded. She is now responsible for overseeing all GWS efforts involving athletic training.

8. Future Directions

Members of the Board and committee chairpersons offered suggestions for areas of concern that the GWS might become involved with in the future. Many were concerned with the quality of leadership in women's athletics. Inadequately trained coaches, officials, administrators, and trainers were being hired rather than those more qualified, often because of financial limitations. It was suggested that a national coaches certification be developed, as well as minimal standards for each of the above positions.

9. Federal Legislation

Marge Blaufarb of AAHPER (Update Editor) reported on the present status of several bills -

A. Parson Bill (S. 3500) The Amateur Athletic Act

To promote and coordinate amateur athletic activity in the United States and in international competition in which American citizens participate, and to promote physical fitness, and for other purposes. The purpose of this Act is to establish an Amateur Sports Board to coordinate amateur athletic competition and a National Sports Development Foundation to support and encourage athletic activity and physical fitness.

B. Mathias Bill (H.R. 11242)

To amend the Act which created the United States Olympic Committee to hold public proceedings before it may alter its constitution, to require arbitration of certain amateur athletic disputes, and for other purposes.

She then briefly reviewed parts of the Education Amendment Act of 1974 (H.R. 69) that were relevant to health physical education and recreation. The Act, which amends and extends the Elementary and Secondary Education Act of 1965, was signed by President Ford on August 21, 1974.

C. Career Education (Section 406)

Every child upon graduation from a secondary school should be adequately prepared for gainful employment and full participation in society. This section authorizes the establishment of an Office of Career Education within the Office of Education.

D. Women's Education Equity (Section 409)

Authorization to make grants with public agencies, private non-profit organizations and individuals is provided under this section to insure educational equity for women at all levels of education. The Act also provides for the establishment of an Advisory Council on Women's Educational Programs in the Office of Education.

E. National Center for Education Statistics (Section 406)

This section provides for the establishment of a center for collection and dissemination of statistics and other data related to education.

F. Study of Athletic Injuries * (Section 826)

Under the provisions of this Section, a 12 month study of the incidence of athletic injury among male and female students must be started 60 days after the enactment of the act (August 21, 1974). Injuries incurred during competition between schools, practice sessions or school related athletic activities were to be reported. A comparison would be made of the incidences of injuries at schools with trainers and/or other medical personnel and those without such trained personnel.

10. Title IX

Margot Polivy, a lawyer from the fimr of Renouf, McKenna and Polivy in Washington, D.C., reviewed a summary of the comments (pro/con related to physical edcuation and athletics) concerning Title IX that had been received by October 1, 1974, and the deadline was October 15. Generally, writers were in favor of 1) the Athletic Section which provides resistance against the NCAA and eliminates open discrimination against women, and 2) separate teams because mandatory co-ed teams would not work. They were against equal opportunity because it would be impossible to carry out the provisions without curtailing some existing programs. Feelings about equal expenditure were mixed.

The board of Directors voted to draw up a statement concerning NAGWS's views on Title IX. The paper was written with the aid of Margot Polivy immediately following the adjournment of the Board meeting. See enclosure.

*Earlier, in my report, to the GWS Board as the N.A.T.A. liaison, I mentioned the Dellumis Bill and its consequence as well as the Forsythe Amendment.

Respectfully submitted,
Holly Wilson

N.A.T.A. Liaison to GWS

A motion was made by Mr. Flentje and seconded by Mr. Sheridan to accept the NAGWS or GWS report by Ms. Wilson.
ACTION: Approved.

XLV. Following discussion on a request by Ms. Wilson in reference to the GWS Special Committee on Athletic Training for development of a brochure, a motion was made by Mr. Jordan and seconded by Mr. Crowl that no commercial company name is to be mentioned for NATA support.
ACTION: Approved.
XLVI. Ms. Wilson requested that a pamphlet be developed and following discussion, a motion was made by Mr. Growl and seconded by Mr. Lane to give permission to GWS to do said pamphlet at no cost to NATA and that there be no mention of commercial companies.
ACTION: Approved.
XLVII. Ms. Wilson requested permission to use the logo from *Athletic Training, Journal of the National Athletic Trainers' Association* "Not For Men Only" column in the GWS pamphlet. Following discussion a motion was made by Mr. White and seconded by Mr. Sheridan to not allow the use of the NATA logo as used in *Athletic Training.*
ACTION: Approved; request for use of logo denied.
XLVIII. Mr. Warren Morris, NATA representative to the NCAA Football Rules Committee submittted the following report:

The NCAA Football Rules Committee met in Arlington, Texas, January 11, 12, 13, 1975.

Enclosed are the 1975 Football Rule Changes. Safety has been our approach to this committee.

The four point chin strap will be mandatory for all helmets in 1976.

The tear away jersey is going to be a called team time out if a number is torn or if a shoulder pad or epilet is loose before the next down.

All players shall wear helmets that carry the NOC SAE seal by 1978. It's recommended for 1975.

The mouth piece rule now has some "teeth" in it. A charged team time out will be called after the play if any player is detected to not be wearing his mouthpiece.

John Waldorf, Chairman of the NCAA Football Rules Committee, is stepping down and is to be commended for his excellent leadership through the years. Mr. Waldorf wants us to help the Rules Committee by keeping accurate game injury statistics, and to turn them in at the end of the year. They have been getting only about 60 percent back. Cliff Speagle is the new Chairman. Mr. Speagle asked the NATA to study the rule concerning blocking. The rule in the book is not being enforced and the Committee would appreciate our opinion as input to writing a new blocking rule.

The High School Federation has presented a paper concerning Butt or Stick Blocking and Spearing. The paper is endorsed and the NCAA rules cover this very well *if* the officials will call the Spearing or Butt Blocking.

The High School Federation would like for the NATA to endorse their proposal. I would recommend to the NATA Board of Directors that we endorse anything that will help the Safety of the Player. We are backed by the Rule on Spearing. (2-Sed. 24, Article 1.)

The (NAIRS) National Athletic Injury Reporting System is just getting started under Dr. K.S. Clarke and Bud Miller and with some financial backing we will have accurate data to work with as input for the N.C.A.A. Football Rules Committee.

Respectfully submitted,
Warren Morris

BUTT OR STICK-BLOCKING AND SPEARING
1/75

Football attracts boys partly because it involves physical contact. In a game in which contact is not only permitted but is also encouraged, it must be conceded there may be some injuries. The fact there are some injuries resulting from good clean legal contact does not make football an inhuman sport as some critics have contended. Neither is football an unsafe sport. Statistics indicate that fewer than 10 percent of high school football players sustain an injury during the course of a season which requires medical attention, and the National Safety Council reports "From the standpoint of fatalities there are *nine times fewer* deaths of high school boys per hour of exposure on the football field than in automobiles."

The rules committee in adopting changes has made every effort to make the game as safe as possible without eliminating the exciting features of football, but the development of the hard helmet along with rules requiring players wear the face protector and mouthpiece have made players more willing to hit first with the head when blocking and tackling. As a result, current coaching and teaching techniques employ the use of the protective equipment as an offensive weapon. By doing this the usefulness of the equipment not only has been negated to a great degree, but also has become a source of serious injury. These techniques which increase the hazards of the game must be eliminated if football is to continue its place in the educational program.

Hitting or butting with the head can be a dangerous practice both to the person initiating the blow and to the player being contacted. It becomes increasingly more evident each year there is a greater need for teaching a player to block and tackle with the head in the proper position so it does not become the principal point of contact. The use of the helmeted head as the primary contact object in both blocking and tackling is the matter of concern at all levels of football. In 1974, there were 10 fatalities directly attributed to football. Of these, 9 were caused by brain injury and one resulted from fractures of the cervical vertebrae.

Spearing and butting or stick-blocking are techniques about which the rules committee is concerned. A 1975 change defines spearing as deliberately and maliciously driving the helmet into a player who is down or who is held so he is going down or who is held so his forward progress is stopped or who is obviously out of play. This is a personal foul, the penalty for which is 15 yards and disqualification. It may be either a live or dead ball foul and may occur to any player including the ball carrier.

Driving the head, encased in a hard and unyielding helmet, into an opponent is probably the most dangerous tactic used in football today. Such acts have resulted in serious damage to the heart, spleen, liver and kidneys as a result of such blows. All who are concerned about the safety of players and the perpetuation of football are unanimous in their opinions this tactic must be eliminated from the game.

The hazards of spearing and butt or stick-blocking are not limited to the hardness of the helmet. The player initiating the contact is in more danger than his opponent. When the head is driven into a player at an improper attitude it may result in acute felxion or hypertension of the neck. These are the two weakest positions for the neck. A blow to the head when the neck is in either of these positions can cause injury to the spinal cord resulting in paralysis from the neck down. The head and neck cannot be completely protected to withstand impact force in these positions no matter how good the protective equipment may be.

In his book, *Head and Neck Injuries in Football*, Dr. Richard C. Schneider, Professor of Neurosurgery at the University of Michigan Medical Center in Ann Arbor, describes two types of injury mechanisms present in football. The first is the knee-to-face guard injury and results from a blow from a ball carrier's knee to the face guard of the tackler so there is an upward and backward thrust of the latter's head resulting in hyperextension of the cervical vertebrae. The second and most dangerous, according to Dr. Schneider, is the knee-to-head injury which results in cervical flexion. These injuries may occur to the cervical spine and are the results of the player lowering his head and making contact with the opponent while his neck is in flexion. In this position, a player cannot withstand a blow as well as when the head and cervical spine are in some degree of extension. The muscles involved in maintaining the latter stance are by far the stronger and better able to withstand the impact. Both of these positions are dangerous and can be minimized by proper coaching techniques.

At the present time there is a public awareness of the problem and a great deal of misunderstanding brought about because of sensationalized television reporting on football injuries. Everyone in football has a responsibility to remove the misunderstanding which do exist concerning football injuries. All groups concerned with football, from the rules makers to coaches and officials, must launch a cooperative campaign to eliminate unnecessary injury hazards which may occur because of improper coaching techniques.

Rules writing committees must construct rules to preserve the best features of the game and to keep it exciting and playable. These committees also have the responsiblity of providing a safe game in which players may participate without being exposed to techniques which have high injury hazards. They have met his challenge by making all striking blows with the hands, forearms and elbows and spearing personal fouls which are penalized by 15 yards and disqualification. Rules committees must rely on coaches to revise their coaching techniques to de-emphasize contact by the head and remove some of the danger.

Coaches have a responsibility to teach techniques which are in compliance with principles of health and safety as well as rules restriction. Blockers and tacklers must be taught to "tuck their head in" holding it in an upright position so they may watch their target and at the same time protect themselves when there is contact with the head. Coaches must emphasize that whenever the head is in a position of flexion, contact is intensified as a result of the weakened position of the cervical spine. Coaches also have a responsibility of conditioning players in order to strengthen the neck muscles.

Officials have the responsibility of unhesitantly enforcing the rules which deal with the safety of players. The use of a prompt whistle when the ball is dead will reduce contact resulting from the swarming-type tackle. It will also reduce piling on, tackling out-of-bounds and spearing which result because of a late whistle.

There is no suggestion there be premature whistles, but the whistle should be sounded immediately when it is apparent the player's forward progress is stopped or the ball is dead. Game officials are directed to be vigilant in the administration of the new rule defining spearing as a disqualifying personal foul.

Because of the number of injuries resulting from using the head as the primary contact in blocking and tackling there is no excuse for the technique to be employed as part of the game. The player who is aware of these possibilities and who continues to practice this technique uses poor judgement and takes unnecessary changes with his life. The coach who teaches this technique is doing a disservice to his profession and to the educational program. The official who does not properly and promptly administered the rule involving player safety is unqualified to continue officiating.

Letter from the National Federation (Executive Offices) 400 Leslie Street in Elgin, Illinois 60120 Clifford B. Fagan, Executive Secretary

Dated: January 23, 1975

Mr. Warren Morris, Trainer
Department of Athletics
University of Georgia
Athens, Ga. 30602

Dear Warren:

As promised, I am enclosing a copy of the second draft of the statement developed by the National Federation in opposition to the coaching and employment of butt-blocking and spearing. As I indicated, we are anticipating including this in a prominent place in all National Alliance Football Rules publications for 1975. We firmly believe this is a matter of upmost importance and would appreciate receiving your comments concerning it. We plan to include statements from leaders in the athletic administration, coaching and medicine to lend credence to our position. We would like to include a comment from you.

The importance of discouraging this technique is attested by the fact that there were ten deaths in high school football during the 1974 season. Eight of these were the result of subdural hematomas, one as a result of damage to the brain stem and the other due to fractured cervical vertebrae. We cannot definitely say each of the injuries leading to death was caused because of butt-blocking or spearing, but because all involved the head and cervical spine, we assume there must have been some contact with the head.

As former football coaches, all of the executive staff of the National Federation recognize it is not

because of butt-blocking or spearing, but because all involved the head and cervical spine, we assume there must have been some contact with the head.

As former football coaches, all of the executive staff of the National Federation recognize it is not possible to remove all contact with the head from the game. We acknowledge it is necessary for players to lead with the head in blocking and tackling in order to center on their opponent and maintain proper balance. However, the use of the head to abuse or punish an opponent is a practice we condemn. We believe football coaches, medical authorities and athletic administrators at various levels also oppose this technique.

Enclosed is a brochure entitled, "Facts of FootballSafety". This was published in retaliation to the television program criticizing high school football. We plan to publish a similar brochure condemning butt-blocking and spearing. We will give it the widest possible distribution when finalized. We look forward to receiving your response and comments on this draft so we may finalize our position paper in the very near future.

Thank you for your cooperation.

Sincerely, yours,
Dick Schafer
Assistant to Exec. Secretary

Letter from the Department of Athletics, University of Georgia, Athens, Ga. 30602.

MEMO TO: John Waldorf, Chaiman
N.C.A.A. Football Rules Committee
FROM: Warren Morris-Certified Athletic Trainer
National Athletics Trainers Association
DATE: January 12, 1975
SUBJECT: Report to N.C.A.A. Football Rules Committee - From National Athletic Trainers Association

The National Athletic Trainers Association is happy to report that progress is being made in the athletic injuries report. The no blocking below the waist on kicks has been very successful.

We have used various means to gather our data to be used as input for this committee.

The National Athletic Injury Reporting System (N.A.I.R.S.) operating at Penn State with Dr. K.S. Clarke and Mr. Bud Miller is just starting to function and hopefully with more money to work with, we shall gain some very valuable data that will help this committee to make their important decisions. The North Carolina High School injury report, (Dr. Blyth and Mueller) is a very beneficial five year study. It is the most comprehensive study on football injuries ever reported. They have found evidence that supports some and surprises others in their theories concerning athletic injuries.

We also have polled fellow trainers to gain some insight that has helped us in this report.

Our number one objective for the Rules Committee is concerned with safety. With this in mind, we make the following recommendations:

1. Maximum effort needs to be made by officials to enforce the rule regarding spearing, late hitting, protecting the passer and kicker.
2. The helmet is a safety factor, but is also causing injuries to opponents. We recommend that a shock absorbing substance to cover the hard outer shell be studied by NOC SEA.
3. We also recommend that the four-point chin strap be mandatory as it will give greater stability and safety.
4. Even with the mouthpiece rule mandatory, we would like for that rule to be enforced as we have had several complaints that many are not wearing their mouthpiece.
5. It has been reported that the markings on artificial turf is still too abrasive and is causing 2nd degree abrasions.
6. The equipment on the sideline: benches, chairs, tables, TV equipment, ambulances, etc. should be available but kept at a safe distance, a minimum of 12' from the sideline and 18' around the end zone be clear of any permanent objects. Solid objects around this area should be padded. Glass, rocks, fence posts and uneven surfaces are unnecessary risks in the game of football and is something that we can eliminate. Our survey clearly shows that injuries to the knee and ankle can be significantly reduced by having all the participants wear 1/2" cleated shoes on well maintained fields.
7. The tear away jersey is causing some injuries. The sharp edges of the epilet be covered with a shock absorbing material and require that the tear away jersey be tucked into the pants or make the tear away jersey illegal.

Football is a multifaceted game. There is the physical game of contact, the mental game of strategy, and the emotional game of endurance and competition. Injury prevention is the key to meeting the demands of football, and the coach is in a significant position to influence that injury factor. The rules and the officials are also a very strong factor.

The National Athletic Trainers Association wishes to commend this committee for its dedication and sincere concern for the prevention of injuries in the game of football.

Respectfully submitted,
Warren Morris.

XLIX. Mr. Frank George presented the following report on a National Federation of High School Associations: 5th National Conference of High School Directors of Athletics, December 9, 1974, Hershey, Pennsylvania:

The National Federation invited NATA to send representatives to a meeting of the advisory board of the Directors of Athletics to discuss: "...engaging certified trainers as members of high school faculties." In their letter was a very welcomed statement and that is:

"The National Federation recognizes the contributions a certified athletic trainer could made to the health, protection and welfare of interscholastic teams and individual athletes. Although there are limitations as far as budgets are concerned, it is the National Federation's position that institutions should engage a certified trainer as a member of its teaching faculty who would also serve as a member of the athletic department staff at the earliest possible time".

Bud Miller, Phil Donley, and Frank George represented NATA at this meeting. Bud and Phil were both within driving distance. There were three members of the eight member High School Directors of Athletics Advisory Board present, as well as two members of the National Federation Headquarers staff, Thomas Frederick and John Roberts. Topics to be discussed were:

1. Programs to professionally prepare high school teacher-trainers.
2. Cooperative efforts by NATA and local schools and school districts.
3. Cooperative efforts on the National level.

NATA provided copies of:

1. Athletic Training Careers
2. NATA Educational Program "Training Program for High School Faculty Members"
3. List of Approved Programs
4. Procedure for Certification
5. Approved program of Education for the Athletic Trainer
6. West Chester State College Athletic Training Education Program
7. Suggested Behavioral Objectives for Athletic Training Education Programs

Mr. Frederick opened the meeting with the National Federation's feelings of the Dellum's Bill and NATA's support of it. NATA's position and the status and intent of the Dellum's bill were explained to the group by me. After these first few uncomfortable minutes, we got down to business and I believe made some points with the group. We explained the need for a trainer and how we proposed to meet this need through our various educational programs. Stressing the idea of a faculty-trainer and also stressing the idea of educating someone already on the high school staff proved encouraging. A main point we continually brought out is that the trainer's full salary would not come from the athletic budget. We asked for compensation equivalent to that of assistant coach. If the work is for three seasons, then an equivalent salary for each season is expected. The group seemed relieved when they accepted the idea that the majority of the salary would be from teaching duties.

The National Federation did not make any firm commitments to support our program. However, Mr. Roberts, the administrative assistant, is making a report to Mr. Clifford Fagan and hopefully, some solid commitments will come from this meeting. We hope to have a speaker on the program at their next conference.

Closely related to this subject is news that Johnson and Johnson Company and the State of Massachusetts are funding a program to educate high school faculty members as athletic trainers. The ultimate goal of this program is to provide NATA certified trainers in the Massachusetts high schools, and to do this in five years.

L. Mr. Frank George presented the following report on the United States Olympic Committee Bienniel Meeting, December 13-15, 1974:

Chuck Medlar was unable to attend this meeting, as his football team is preparing for a bowl game. I attended in his place, and was glad of the opportunity to be able to discuss with some of the United States Olympic Committee officers, NATA's relationship with USOC. I was also able to learn a good deal concerning the mechanisms and workings of the USOC. Some of the men I met and talked with were Philip Krumm, President of USOC: of course Al Duer, 3rd Vice President and close friend of NATA; and E. Newbold Black IV, the Secretary of USOC; and Patrick Sullivan, Legal Counsel for the USOC.

The stated object of this meeting was to amend the USOC Constitution. A good part of the meeting was spent approving amendments to the Constitution. An attempt was made by a lawyer, Mr. Michael Scott, representing NCAA and the Amateur Basketball Association of the United States, to stop any amending of the USOC Constitution. He stated seven reasons why the Constitution should not be amended. Basically, he stated the proper steps for amendment were not being followed. One of these is that the delegates did not receive the amendments far enough in advance of the meeting. If for this reason the amendments are challenged in court, the delegates will receive the same amendments for a mail vote.

It seems the general feelings of the delegates was that the amendments made would give the athletes a greater role in determining USOC policy. One of the amendments which I thought would directly affect the NATA Olympic selection policy is included in the Athletes' Bill of Rights. It reads: Article II. Section 6. The corporation (USOC) shall, by all lawful means at its disposal, protect the right of every individual who is eligible under reasonable national and applicable international amateur athletic rules and regulation to participate if selected (or attempt to qualify for selection to participate) as an athlete, coach, trainer, administrator, manager, or other official representing the United States in any international amateur athletic competition) if such competition (conducted in compliance with reasonable national and applicable international requirements) involves any sport included in the Olympic Games or Pan American Games program during the Olympiad period concurrent with such participation or the attempt to qualify for participation. Notwithstanding these provisions, the corporation shall honor the decision of any member of the corporation or any university, college, high school, or other educational institution which an individual is attending at the time of his selection to participate or attempts to qualify to participate, to deny him such right, provided that, after an appropriate hearing conducted by such member or by the educational institution at a reasonable time prior to such participation, it is determined that such activity would violate applicable amateur athletic rules or unreasonably interfere with the individual's academic or athletic interests - or, in the case of a coach, manager, or administrator, with his employment interests - at the individual's institution. In any other instance, the corporation shall be all lawful means at its disposal, prevent any person or organization from director or indirectly - throught he imposition or threats of imposition, of penalities or other sanctions upon the individual or the educational institution concerned - coercing or interferring with the freedom of the individual to participate, or to attempt to qualify for selection to participate, in any amateur athletic competition covered by this section.

NATA By-Laws do state that a member is in violation of the NATA code of ethics if he directly submits his name to the USOC for selection as an Olympic or Pam Am game trainer. I spoke with Mr. Patrick Sulivan, legal counsel for the USOC concerning this section of NATA By-Laws. He stated that NATA is entirely within its rights to require its members to follow a specific procedure to be considered for selection. Perhaps NATA should get further legal advice, or ask for a concrete statement from USOC on this matter.

Another amendment which was passed, which could directly affect NATA states: Section 5(f) (6) It has established and follows procedures which assures that the nomination and selection of coaches, administrators, trainers, and athletes will be conducted without regard to organizational affiliations and so that the selection will fall upon the most highly qualified individuals.

This could mean the medical and training services committee would be wrong to give special consideration to a trainer, because he is on the NATA recommended list. Hopefully, this will not be the case. The reminder of the meeting was on Committee reports.

Pan American Games, Mexico City, Mexico
10/2-10/26, 1975
Winter Olympic Games, Innsbruck, Austria
2/4-2/15, 1975
Summer Olympic Games, Montreal, Canada
7/17-8 1, 1976

REPORT OF THE MEDICAL SERVICES COMMITTEE

Philip O. Krumm, Chairman

The Medical Services Committee, after several meetings and reviewing appications of many medical personnel, recommended the medical staff for the Pan American Games to the Board of Directors at its meeting held on Saturday, September 21, 1974. The Board of Directors approved the recommendations of the Commitee. The Medical Services Committee will continue to meet to review applications and make selections of the medical staff for the Winter and Summer Olympic Games for approval by the Board. Careful consideration is being given to assure a capable and well-rounded medical and training staff for each set of Games. Prior to the Games, the medical staff will be given a thorough orientation on their duties and responsibilities at the Games.

The athletic trainers for the Olympic Games will be selected some time in June, 1975.

LI. The Board of Directors recessed for the night at one-thirty o'clock a.m., Monday, March 3, 1975.

LII. The meeting was reconvened at eight-o-five o'clock a.m., Monday, March 3, 1975, President George presiding.

LIII. Mr. McLean reappeared before the Board with a request of $500.00 from the NATA General Funds for a meeting with the Professional Examination Services. In discussion Mr. McLean pointed out that his committee did not need a meeting every year. Following discussion, a motion was made by Mr. White and seconded by Mr. Lane to fund the Certification Committee with $500.00 for a meeting on May 5-6 with the Professional Examination Service.
ACTION: Approved.
LIV. Mr. Robert Hartman of Maginnis and Associates, Chicago, Illinois, appeared before the Board of Directors to discuss a proposed liability insurance program. The annual premiums of this program is $44.00.

Following discussion, a motion was made by Mr. Crowl and seconded by Mr. Smith to accept the professional liability insurance proposal by Maginnis and Associates as offered to Certified, Associate and Student members.
ACTION: Approved.
LV. Following brief discussion, a motion was made by Mr. Flentje and severally seconded by Mr. White to investigate and study additional insurance coverage which Maginnis and Associates might have which would be of value to NATA members and to report to the Board in June.
ACTION: Approved.
LVI. President George led the Borad of Directors in a lengthy discussion on the selection of trainers to the Olympic Games. The discussion was wide in scope as to cover various aspects.
LVII. The NATA Ethics Committee requested a change be made in Article 2, Section 3 of the NATA Code of Ethics to the following:

An NATA member who wishes to be considered for assignment to represent the NATA as an Olympic or Pan American Games trainer or to represent NATA in any other responsibility, shall seek (Request to change the work "seek" to "accept") this consideration only through the NATA Officers and/or Committees designated to handle such representation.

Following discussion, a motion was made by Mr. Sheridan and seconded by Mr. Lane for the wording in Article 2, Section 3 of the NATA Code of Ethics to remain unchanged.
ACTION: Approved - 8 for; 1 against; District 10 absent.
LVIII. Following discussion on a request by Dr. Dan Hanley to President George to submit a list of women athletic trainers to the Olympic Committee, a motion was made by Mr. Flentje and seconded by Mr. Jordan that President George sent Dr. Hanley the list of all certified women athletic trainers to the Olympic Committee, a motion was made by Mr. Flentje and seconded by Mr. Jordan that President George send Dr. Hanley the lsit of all certified women athletic trainers for the USOC Medical and Services Training Committee and that it should be pointed out that the NATA Board of Directors in June, 1974 approved the name of Holly Wilson to be submitted to the USOC.
ACTION: Approved.
LIX. Following discussion, a motion was made by Mr. Lee and seconded by Mr. Lewellyn that "no athletic trainer shall be honored by the NATA at the Annual meeting if he or she was not recommended to the USOC by the Board of Directors of the NATA".
ACTION: Rejected 2-6-1
Yes: Districts 3 and 7
No: Districts 1, 2, 4, 5, 6, and 9
Abstain: District 8
Absent: District 10
LX. Following discussion, a motion was made by Mr. Lee and seconded by Mr. Lane that "No Certified Athletic Trainer shall serve as an Olympic Trainer more than one time" (Either as a trainer for the Pan American Games or the Olympic Games.)
ACTION: Rejected: 2 yes - 7 no
Yes: Districts 6 yes and 7
No: Districts 1, 2, 3, 4, 5, 8, and 9
Absent: District 10.
LXI. Recommendations were made by Mr. Sheridan and Mr. Lane to develop a policy for the selection of Olympic Games trainers. Much discussion followed with no results produced. President appointed Mr. Sheridan, Mr. Land and Mr. Lee to an ad hoc committee to study Olympic selection procedures and to make recommendations to the Board of Directors prior to May 1, 1975 for further study before the Bard meeting in June.
LXII. The History and Archives committee requested $10,000.00 for the publication of the history of NATA. Following discussion, a motion was made by Mr. Jordan and seconded by Mr. Flentje to deny the request for $10,000.00.
ACTION: Request Not Approved.

LXIII. The History and Archives Committee requested permission to select a University for the Archives. Following discussion a motion ws made by Mr. Lane and seconded by Mr. Flentje that the History and Archives Committee chairman investigate and make a recommendation to the Board in June for a place to have the Archives.
ACTION: Approved.
LXIV. The 1975 convention was discussed. Sunday, June 8th will be Family Day at Disneyland. The cost for this day is $5.00 per person. This included admission and all rides. The Honors Banquet will be on Tuesday night, June 10th.
LXV. President George directed the Board to discuss with each of the districts the feasibility of more conventions in the Central area of the country.

LXVI. Placement Committee chairman Rod Poindexter, University of Nevada, Las Vegas submitted the following committee members for approval:
District 1: Carl Krein, Central Connecticut State
District 2: Gene Castrovillo, Alfred University
District 3: Terry Middlesworth, University of N.C.
Distraict 4: Dave Shon, Wright State University
District 5: John Booher, South Dakota State
District 6: John Barnett, Waco Texas Independent School District
District 7: Larry Willock, University of New Mexico
District 8: Jerry Lloyd, California State University, Fullerton
District 9: Ernie Golin, University of Georgia
District 10: Larry Standifer, University of Oregon

A motion was made by Mr. Lane and seconded by Mr. Sheridan to approve the above request.
ACTION: Approved.
LXVII. The Placement Committee budget request was discussed and a motion was made by Mr. Flentje and seconded by Mr. Lane to table the request until June.
ACTION: Approved.
LXVIII. It was again noted that the Placement Committee is not to provide non-NATA members their servives.
LXIX. A motion was made by Mr. Sheridan and seconded by Mr. Lewellyn to provide continuing education credits for members of the Placement Committee for establishing Athletic Training Programs in institutions that as of now do not have them should be referred to the Professional Educational Committee.
ACTION: Approved.
LXX. The Public Relations Committee report was discussed.
LXXI. A proposal from Jim Whitsel, District 10, was submitted for the development of a postage stamp to commemorate NATA and Athletic Training. A motion was made by Mr. Crowl and seconded by Mr. Jordan to accept the above proposal.
ACTION: Approved.
LXXII. Richard Malacrea, chairman of the Public Relations Committee requested that the Bord accept his resignation as committee chairman. This will be further discussed in June.
LXXIII. The Recruitment Committee requested $600.00 for new brochures. A motion was made by Mr. Lewellyn and seconded by Mr. White to accept the above request.
ACTION: Approved.
LXXIV. There was no report from the Research and Injury Committee.
LXXV. The following resolution by John L. Sciera, Cortland State College, was discussed by the Board.
Resolution: Whereas, this Association of Athletic Trainers is dedicated to the *prevention* of injuries to athletes.

Whereas, many of our country's leading medical authorities have documented (Dr. Richard C. Schnieder, M.C. TEXT: Head and Neck Injuries in Football) and cautioned the football coaches repeatedly against the use of the head-first tackling technique. (Defined not a spear tacking but as making first contact with the head).

Whereas, this injury is of such severe magnitude that it overshadows most other bodily injuries.

Whereas, the forty-second annual survey of football fatalities of the American Football Coaches Association Dr. Carl Blyth advises coaches to discourage the players from using their heads as a battering ram when blocking and tackling.

Now, Therefore, Be It Resolved, that the National Athletic Trainers Association is on record as opposed to the teaching and use of this most dangerous technique of tackling.

Be It Further Resolved, that the resolution be publicly stated and circulated to all members of the national Athletic Trainers Association and the American Football Coaches Association.

Be It Finally Resolved, that the National Athletic Trainers Association caution the Rules Committee of the American Football Coaches Association and the Rules Committee of the National High School Football Coaches Association against the use of the dangerous aspects of the head-first tackling technique.

A motion was made by Mr. Jordan and seconded by Mr. Lee that the resolution be referred to the NATA Rules Committee.
ACTION: Approved (Resolution to be sent to NATA Rules Committee for recommendation to the NATA Board of Directors with substantiating evidence for their recommendation further study needs to be produced).
LXXVI. A motion was made by Mr. Crowl and severally seconded to table the discussion on spearing, butt blocking and resolutions until June.
ACTION: Approved.
LXXVII. A motion was made by Mr. Crowl and seconded by Mr. Flentje to table the request by the National Federation of State High School Association statement on butt blocking and spearing.
ACTION: Approved (Tabled).
LXXXVII. Mr. Lane brought to the attention of the Board that Congressman Dellums has re-introduced two bills - H.R. 347 which provides protection of safety and health standards under the Occupational and Safety Health Act of 1970 for individuals participating in athletic contests between secondary schools or between institutions of higher education; ad H R 343, entered January 14, 1975, which is a bill to require educational institutions engaged in scholastic athletic competition to employ Certified Athletic Trainers.
LXXIX. The Bord of Directors discussed the needs of the certification committee chairman Lindsy McLean. The feeling is that with the added work, the committee should be restructured to get some help on a regional basis to process certification applications.
LXXX. The next Board of Directors meeting will begin on Thursday, June 5, 1975 at six o'clock p.m., Anaheim, California.

LXXXI. The Report of the NATA Ad Hoc Committee on women in Athletic Training was presented as follows:

The Ad Hoc Committee on Women in Athletic Training, although it has been relatively inactive since June, has been striving to attain the recommendations presented to the Board of Directors in Kansas City.
a. Representation on Standing Committees

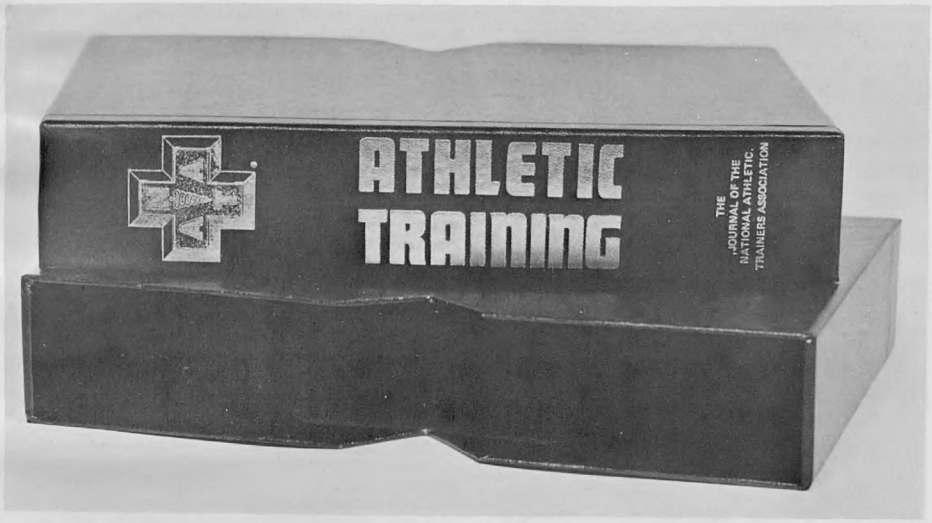
A survey was made of all certified women trainers to identify those who would be willing to serve on N.A.T.A. Standing Committees and their preferences. Each one was asked to list three committees. It was stressed in their cover letter that stating a preference would not automatically insure appointment to a particular committee for appointments must be made by the Board of Directors.
b. Liaison Appointments

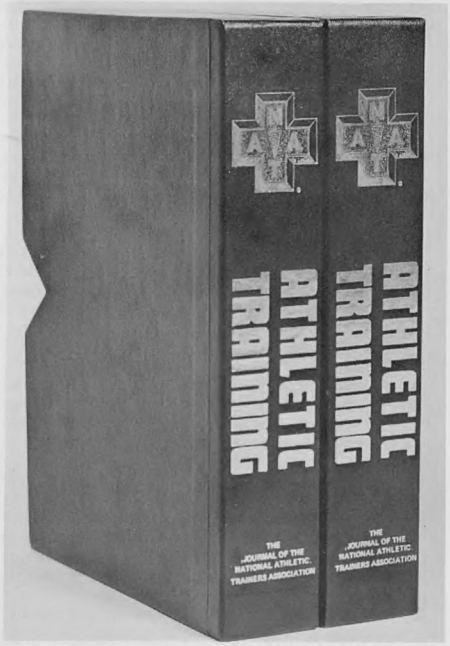
Holly Wilson was appointed at the N.A.T.A. liaison to NAGWS (National Associtation for Girls and Women in Sports - formerly DGWS). She represented the N.A.T.A. at the organizational meeting of the new GWS Board of Directors, October 3-5 in Washington, D.C. Although several letters have been written by Frank George, President of the N.A.T.A. liaison relationship with the AIAW has not been established. Marge Alhohm of Indiana University has expressed an interest in the appointment.
Recommendations:
a. The committee would like to continue its status as an Ad Hoc Committee. A meeting is planned at Anaheim, and it is hoped at that time, the committee will be able to identify future concerns of women in athletic training.
b. The committee would like to be allocated funds to reimburse the chairman for monies spend on xeroxing, mailing, and infrequent phone calls, and to support future communications primarily via mail, but in an emergency via phone. Justification: Other than envelopes and occasional postage from the department, the chairman does not have access to a budget to support her endeavors in the advancement of women in athletic training.

Holly Wilson
Chairman, N.A.T.A.
Ad Hoc Committee on Women in Athletic Training

LXXXII. Mr. Jordan made a motion to adjourn, whereupon in accordance with regular motion as above made, seconded and carried, the meeting was adjourned sine die at 2:05 o'clock p.m., Monday, March 3, 1975.

A Good Save!





In fact, the ATHLETIC TRAINING Library Cases, pictured above, are the best way to save and protect your copies of ATHLETIC TRAINING. They're custom-designed for the magazine. Rugged. Handsome. A perfect way to conserve space. Color: Navy blue and beautiful gold. Prices: $4.25 each; 3 for $12; 6 for $22. To order, just fill in and mail the coupon below.

Allow three weeks for delivery.

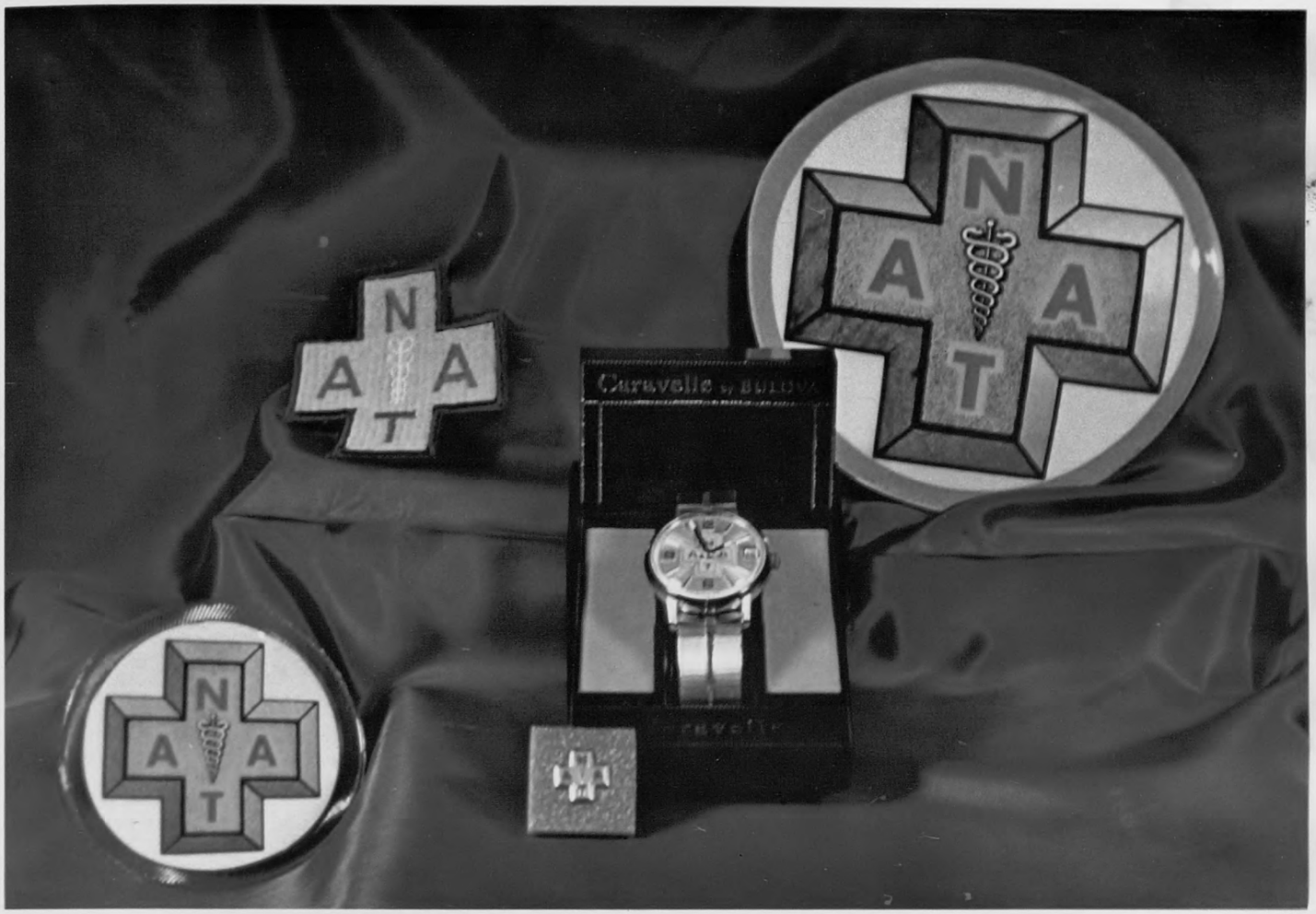
To: **ATHLETIC TRAINING**, P.O. Box 5120, Philadelphia, Pa. 19141

Please send me_____ **ATHLETIC TRAINING** Library Cases. Prices: $4.25 each; 3 for $12; 6 for $22. My check (or money order) is enclosed.

Name _____

Address _____

City _____ State _____ Zip _____



Proudly Display Your NATA Emblem

Lapel Pins	3.50
Cloth Emblems	1.50
Wristwatch with Bracelet Band	37.95

Available through
N.A.T.A.
3315 South Street
Lafayette, Indiana 47904
AVAILABLE TO NATA MEMBERS ONLY

National Athletic Trainers Association

NATA

Coolers Speed Dispensing!

Keep Your Teams' Fuel Tanks Filled During Every Practice and Game With the Best Tasting Thirst Quencher of All.

QuicKick®
The Super Energy Action Drink

FREE 5 gal. cooler

NO CERTIFICATE
NO RED TAPE
CHOOSE the flavors YOU WANT!

HOW

Buy from your Sporting Goods Dealer:

Four cases of 24 each - 1 gal. packets Quickick® (96 gals.) at $20.75 per case **= 86 cents a gal. or 22 cents a qt.**

OR

Five cases of 5 each - 5 gal. packets Quickick® (125 gals.) at $17.95 per case **= 72 cents a gal. or 18 cents a qt.**

AND

Your Sporting Goods Dealer will deliver your FREE 5 gal. cooler or coolers with the order. Choose these flavors by the case: Orange, Grape, Punch, Lemon-Lime.

WHY

Cramer wants to prove that Quickick® the Super Energy Action Drink is the best tasting and most economical thirst quencher for your team.

OFFER EXPIRES Nov. 1, 1975 (Limit 15 Coolers per School)

Cramer Products, Inc.
GARDNER, KANSAS U. S. A. 66030