# THE JOURNAL of the National Athletic Trainers Association

SUMMER 1969
Volume 4
Number 2


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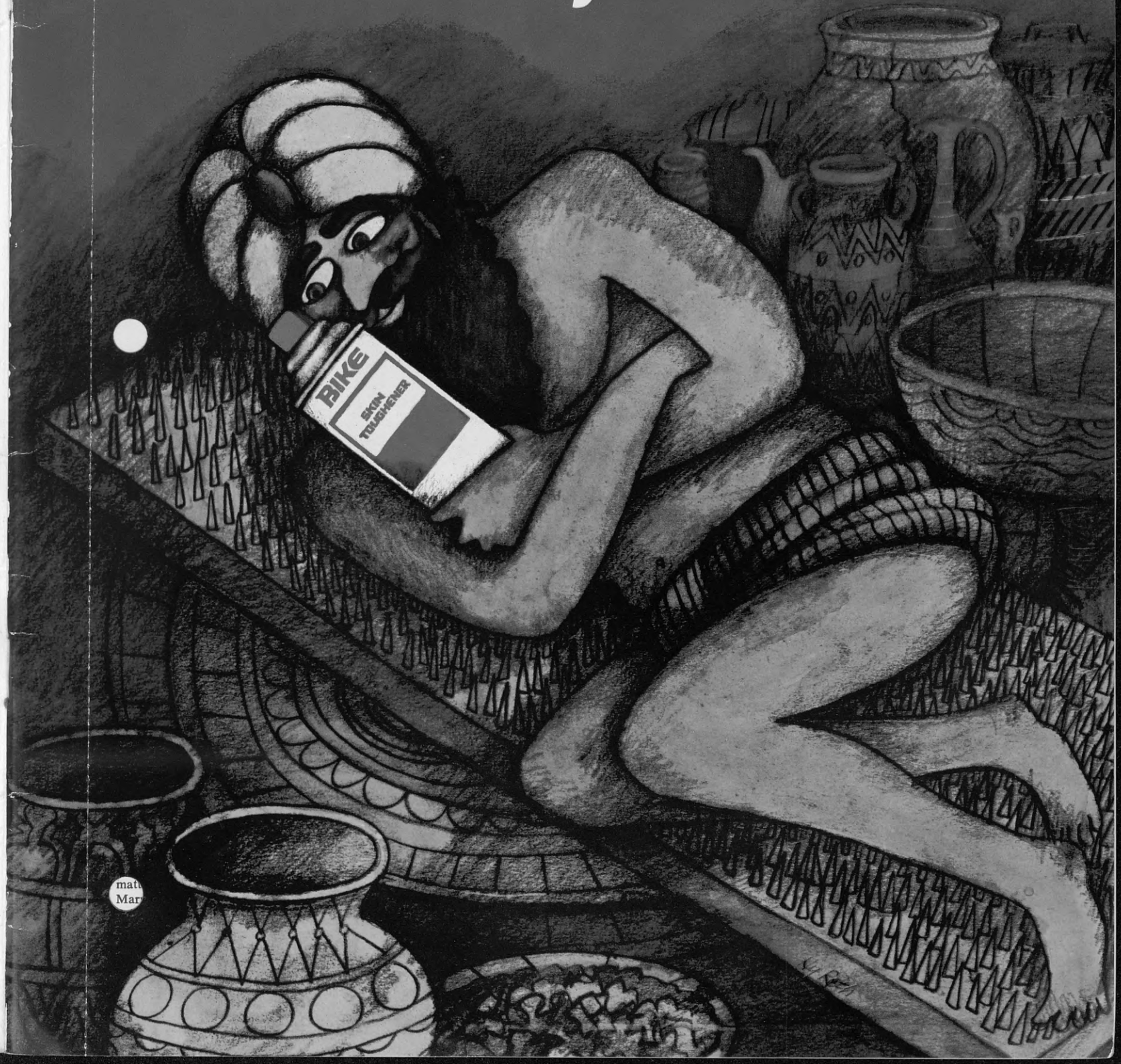

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# THE JOURNAL
## of the National Athletic Trainers Association

SUMMER 1969

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CONTENTS






*The Journal* of the National Athletic Trainers Association is published quarterly at 3315 South St., Lafayette, Indiana 47904. Subscription charge to members: $1.00 per year.

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The *NATA Journal* editors welcome 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 suggestions are offered to those submitting articles for consideration:

1. All manuscripts should be typewritten, double-spaced, on ordinary typing paper, 1500-2000 words.

2. When references are made to other published works, include superscript numerals and appropriate footnotes giving author, title of book or article, periodical or volume number, pages, and date of publication.

3. Photographs must be black-and-white prints, preferably on glossy paper. Graphs, charts, or figures should be clearly drawn on white paper, in a form which will be readable when reduced for publication.

4. It is the understanding of *the Journal* editors that any manuscripts submitted will not have been published previously.

Unused manuscripts will be returned when accompanied by a stamped, self-addressed envelope. Please address contributions to the Editor.

# Study of the Comparative Effectiveness of Ankle Taping and Ankle Wrapping on the Prevention of Ankle Injuries

James E. Simon, EdM, LPT

As the status of the athletic trainer increases and the true value of his services are fully recognized, it becomes essential that members of the profession recognize the paucity of scientific evidence to support many of its traditional procedures. It is the sole responsibility of our profession, if we wish to be other than technicians, to critically examine practices which appear to be based on traditional usage or on excessive promotion by commercial interests. We must become capable, as individuals, of devising studies and research, that is scientifically acceptable, which will determine whether such practices are of discernible value.

Today's demands on a trainer's time and budget no longer warrant the retention of practices or procedures which fail to survive the critical scrutiny of controlled study. Increased professional recognition must be justified by prompt elimination of "folklore" treatment which may exist. In short, we must be able to provide sound reasons for what we do or we should stop. It is a well documented fact that good intentions do not guarantee good results nor do they guarantee any results at all.

Adhesive taping for the prevention of ankle injuries is one common practice which appears might be included with others of *unproven* effectiveness. Although there exists a great variety of descriptive literature regarding taping techniques there is a disturbing absence of information relating to legitimate evidence of the effectiveness of tape in limiting injury producing motions. There appears to be the consistent assumption that adhesive tape applied in directions which oppose injury producing motions will check forces prior to their absorbtion by ligaments in a joints structure. This assumption is open to serious debate.

TAPED

WRAPPED

The practice of ankle taping has received its greatest acceptance in the highly competitive areas of college and professional football. One would suppose they are advised by the most expert opinion available. The disasterous consequences of ill-timed ankle injuries to key personnel are possibilities which result in grave concern and a strong desire to provide any effective protection expert opinion considers of value.

In an attempt to sample such expert opinion, a survey was conducted of the attitudes and practices of ten team physicians and ten head trainers of major colleges and professional football teams. The survey can be summarized as follows:

1. *Nine trainers and two physicians replied with opinions.*
2. *Of this total, nine individuals believed ankle taping to significantly decrease the incidence of ankle injuries on their teams.*
3. *None of these could provide scientific basis for their opinions.*
4. *Seven believed ankle wrapping to be less effective and four believed the two techniques to be equally effective.*
5. *None could provide a scientific basis for this opinion.*
6. *The average cost per institution for materials used for the prevention of ankle injuries was $3500 per year.*

It is apparent that there are differing opinions among the experts and that these opinions are personal inferences arrived at through relatively casual observations.

## THE PROBLEM

In light of an apparent lack of evidence supporting or rejecting this expensive and time consuming practice, it was decided to attempt a study to provide some measure of the comparative effectiveness of ankle taping and ankle wrapping in the prevention of ankle injuries in college football.

## STUDY PROCEDURE

The varsity football squad of the State University of New York at Buffalo was divided into two, approximately equal groups for the spring practice periods of 1967 and 1968. In an effort to obtain some degree of random sampling, this division was accomplished alphabetically: during 1967, A-L wrapped daily by assigned trainers using "Louisiana Wrap"; M-Z taped daily by different assigned trainers, all using double stirrups, double figure-eights, medial and lateral heel locks. This system was repeated in 1968 with the exception that A-L were then taped and M-Z were wrapped. All wore heel discs except defensive backs.

All individuals with known histories of chronic ankle problems were eliminated as were a small number of individuals who strongly resisted random placement because of conflicts with established personal habits of protection. It was felt this latter group might be unreliable in their reports of injury. If an individual injured either ankle during the course of the study, he was immediately eliminated and his days of practice were no longer included in our tabulations following his date of injury.

The purpose of the study was fully explained to all squad members and attendance records were carefully maintained as were records of the daily taping and wrapping of the assigned squad members. Precautions were taken by all trainers to insure that squad members were protected *only* as specified and we feel that this was accomplished. It may be possible, however, that an occasional member attended a practice session *unprotected* due to his failure to report as directed.

The number of practice sessions attended in full equipment were tabulated for each individual and then for each group. Any ankle injury which required a disruption of an individual's practice routine was noted and the injured ankle was inspected to assure it had been protected as specified for the study. At the close of spring practice totals were determined and compared. This comparison was accomplished by the construction of a statistic expressed as the number of ankle injuries per man-practice day in full equipment. It was postulated that any significant difference in this statistic between the two groups could be taken as evidence of a difference in effectiveness. It was further postulated that a lack of any significant difference could be taken as evidence of no difference in effectiveness. It should be noted however, that the study *does not,* in this second case, demonstrate that either technique offers any degree of protection at all.

## RESULTS OF THE STUDY

| | TAPED | | | WRAPPED | | |
|---|---|---|---|---|---|---|
| | No. | Man/prac. days | Ankle inj. | No. | Man/prac. days | Ankle inj. |
| 1967 | 35 | 603 | 4 | 38 | 689 | 4 |
| 1968 | 38 | 667 | 0 | 37 | 634 | 0 |
| TOTAL | 73 | 1270 | 4 | 75 | 1323 | 4 |

## CONCLUSIONS

There is an obvious similarity between the totals calculated for the two test groups. These totals of ankle injuries/ man-practice days were compared statistically using the T Test of Significance Between Two Sample Means by John Lupienski, a statistician at SUNYAB. Based upon the data, he concluded that there is no difference in effectiveness demonstrated by the two techniques tested. He feels that this inference can be made with a degree of certainty which exceeds 99.5%

## SUMMARY

There appears to be little, if any, evidence available to support or reject the practice of ankle injury prevention through taping or wrapping. Expert opinion varies regarding the value of these common practices. A two year study of their comparative effectiveness resulted in data demonstrating no difference in those techniques tested. This inference can be made with a statistical certainty of 99.5%. The study did not provide any information as to whether either of these techniques do, in fact, provide any protection at all. It is hoped that the results of this study will stimulate further controlled studies of a similar nature which would compare taped and untaped groups with the untaped groups receiving no protection at all.

# Liquid Meal Survey

by Dennis Elliot

Today the role of the athletic trainer is one which is diversified to such an extent that his presence and influence is felt and valued in many areas of athletic-related endeavors. Except in the case of extreme physical injury, the athletic trainer is responsible for the health and conditioning of his athletes beyond the workload outlined by the coaches. One area of prime and growing importance is the planning and implementing of a suitable "training table" for his athletes.

A survey conducted by Mead Johnson revealed some notable trends among trainers today, particularly with regard to the use of liquid foods in an athletic environment.

The survey was mailed to a total of 78 professional team trainers, and 99 college trainers across the country. Athletic trainers were selected as the recipients of this survey because of their involvement in the entire athletic program, and because it was believed that they could effectively evaluate and determine the best uses for a liquid meal.

At the outset it was determined that over half (51.9%) of the trainers who returned the survey have the sole responsibility for planning the training table. An additional 38.9% stated that they make recommendations to the coach or athletic director concerned. These figures are representative of the increasing responsibilities a trainer must assume in his everyday activities.

The response to the survey indicated that approximately 95% of the trainers were aware of liquid meal products, and 83% of these felt that a nutritionally complete liquid meal would be a useful addition to their training programs. A variety of opinions were expressed as to a liquid meal's best use, but the most often mentioned were for use as a pre-game meal, for additional calories in a weight-gain program, for weight maintenance during the season, and for a problem eater or athlete who loses weight easily.

Nearly three-fourths (73.1%) of the trainers indicated that they were presently using a liquid meal in their training programs.

In general, strong points which were indicated for liquid meals were that this type of food was well-accepted by their athletes, and that the liquid meals were easily and quickly digested prior to and following vigorous physical workouts. Liquid meals were also found to be a concentrated energy source, nutritionally balanced and convenient to use.

A pre-game situation was indicated as being the ideal time for using a liquid meal because it is filling, easily digested, and because it is valuable as a concentrated energy source. Following a practice, liquid meals can be used as a satisfying drink while providing extra calories at the same time.

As might be expected football was felt to be the sport where a liquid meal could be most valuable. Football demands endurance and quick disbursements of energy over varying amounts of time, and weight loss is a constant factor, as is weight maintenance. Basketball was a close second, followed by wrestling, track and swimming.

Athletes using a liquid meal find it acceptable when used as part of the training table in addition to a diet of regular foods. Others consider it an integral part of their body development program and still others think of a liquid meal as an extra treat.

This survey was successful in bringing several major points to the surface with regard to the training table. The trainer today has become more and more involved in the decision-making aspects of the athlete's food intake. He is focusing his attention on what foods to buy, why these particular foods are best, and in many cases he works closely with a dietician in making sure the athletes are receiving a balanced menu.

In the past few years liquid foods have become an important part of and welcome and useful additions to the athletes training table. Clinical studies have been conducted which substantiate the value of liquid meals. For instance, a study

*(Please turn to Page 18)*

# Twentieth Annual Meeting of the National Athletic Trainers Association

June 8, 9, 10, 11, 1969
Netherland Hilton Hotel, Cincinnati, Ohio

SATURDAY, JUNE 7

1:30 —Board of Directors Meeting

SUNDAY, JUNE 8

9:00- 5:00—Registration—Joe Blankowitsch
9:00 —Board of Directors Meeting
5:30- 8:00—Buffet, Stouffers Cincinnati Inn, Cramer Chemical Company

MONDAY, JUNE 9

8:00 —Registration—Joe Blankowitsch
8:30 —Exhibits Open
9:00- 9:15—GENERAL SESSION BEGINS: Welcome, Eugene P. Ruehlmann, Mayor, City of Cincinnati
9:15- 9:30—Recognition of Exhibitors—Warren Ariail
9:30- 9:45—Bike Foundation Awards for Service—Dave Thomas
9:45-10:30—KEYNOTE ADDRESS—Fred L. Allman, Jr., MD, Atlanta, Georgia
10:30-11:00—BREAK
11:00-12:00—National Business Meeting—Gary Delforge, presiding
12:00- 1:30—LUNCH
1:30- 2:15—"Cervical Spine Injuries, Immediate Action"—Ralph Berlin, Pittsburgh Steelers.
2:15- 3:00—"Injuries to the Knee Joint"—Melvin L. Olix, MD, Columbus, Ohio
3:00- 3:30—BREAK
3:30- 4:15—"Injuries to the Hand and Wrist"—Adrain E. Flatt, MD, The University of Iowa
4:15 —District Meetings
7:00 —ANNUAL HONORARY MEMBERSHIP AND AWARDS BANQUET

TUESDAY, JUNE 10

9:00 —District Secretaries Meeting
9:00- 9:45—"The Medical Aspects of Weight Control in Wrestling," Donald L. Cooper, MD, Oklahoma State University
9:45-10:15—BREAK
10:15-11:00—"Use and Abuse of Steroids"—Everett L. Jung, MD, Cincinnati Bengals and Miami University
11:00-11:15—Olympic Report and Introduction of Olympic Trainers, Chuck Medlar, Penn State University, Head Olympic Trainer 1968
11:15-12:00—DUKE LECTURE "Medical and Training Services for International Competition," Daniel F. Hanley, MD, Bowdoin College, Medical Director, 1968 Olympic Games
12:00- 2:00—LUNCH—Tour MacGregor Plant
2:00- 2:45—"Hamstring Injuries," Buddy Taylor, Los Angeles Stars
2:45- 3:15—BREAK
3:00 —Board of Directors Meeting
3:15- 4:00—"Injuries to the Eye, and Contact Lenses, Richard Glins, MD, Hamilton, Ohio
4:00- 4:30—"Mouth Protector Outlook 1969—Record in all contact sports," W. D. Heintz, DDS, Ohio State University, Consultant, American Dental Association
6:00 —Open House—Johnson & Johnson
8:05 —Cincinnati Reds vs. St. Louis Cardinals

WEDNESDAY, JUNE 11

8:45- 9:30—"Problem and Probable Solutions in Athletic Training on the High School Level,"—Thomas E. Wilson, Michigan Tech.
9:30-11:00—Workshop, Pat Dyer, Purdue University, Chairman
"The Dallas Knee Wrap," Don Cochren, Dallas Cowboys
"Heat Illness," Fred Hoover, Clemson University
"The Foot," Dick Hoover, Northwestern University
"Baseball Conditioning," Bob Bauman, St. Louis Baseball Cardinals
"Knee Rehabilitation," Fred Zamberletti, Minnesota Vikings

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# Faculty Trainer-

## *A New Program for Nebraska High Schools*

by John G. Yost, MD

During the past 10 years, the participation in physical fitness programs and athletics has developed a great increase in importance in the development of the adolescent. Because of this, it has become apparent that programs must be instituted to minimize injuries and rehabilitate those that do occur. The subcommittee on athletic injuries of the State Medical Society started such a program six years ago. The first project was to establish basic guidelines for participation in contact and non-contact sports. These were sent to all schools this fall. Along with this, the preseason physical exam was emphasized and a form developed for use by the schools.

This form was set up so the boy could use the same form from the time he starts athletic participation in the eighth grade through the twelfth grade. This was done so that any physical defects could be noted at the beginning of athletic participation and any injuries could be noted so proper steps in future years could be instituted to minimize aggravation of these injuries which might jeopardize his future participation.

To better implement this last program, the committee at present is trying to establish a program of trainers in all secondary schools. It is financially impossible for any high school to employ a full time trainer. It is also impossible to find enough trainers to take care of even the class A schools in Nebraska. An outline to implement such a program was developed, and in 1968 approved by the House of Delegates of the State Medical Association.

A very utilizable program can be developed by using an interested member of the present school faculty. This program has been used and it works. It has been in use in the Hastings High School for approximately five years. The essence of the program is to take an interested member of the faculty and, through attendance at work shops and meetings on athletic training, enable him to learn basic principals. The faculty trainer can be taught such things as how to check and fit equipment and how to check and supervise practice and playing fields. By this, we mean to make sure the field does not have a great deal of stubble in it, that it has been watered and mowed. He should be able to supervise and advise on conditioning programs and be versed in protective taping and bandaging.

He should be available on the field at all times during practice and be able to extend basic first aid. He should also have a very definite pre-arranged plan set up on the handling of any and all medical emergencies.

### BASIC REQUIREMENTS

In his training room, he should have available basic things for the administration of first aid and the taking care of minor injuries. He should also have and know how to use basic equipment for physiotherapeutics measures to rehabilitate injuries so that a boy may return to participation as soon as possible.

The next function of this trainer is to keep a set of records listing injuries of each boy, so that prior to the commencement of each season, prophylactic measures can be instituted to prevent aggravation of old injuries.

In the whole program, he should work in close cooperation with the team physician. The Athletic Injuries Committee of the AMA has listed in a brochure what a team physician is and what his responsibilities are—also his relationship with the coach and the school and the parent.

To better establish this relationship, it is hopeful that in the next year, a Nebraska Organization of Team Physicians can be formed. It is hoped that we can have a member from every major school system represented.

One of the difficulties in evaluating athletics and their morbidity is the lack of any research having

been done on the general nature of athletic injuries. For over 30 years, an accurate registry of all deaths from football has been maintained. Aside from this, only spotty information can be obtained concerning the number of injuries, the type of injuries and the morbidity from these injuries. What studies that have been done have primarily been done on a college level. At the present time, North Carolina is attempting a study.

The sub-committee on athletic injuries in Nebraska has applied for a grant from the United States Public Health Service and we have been assured it will be forthcoming in the next year. Under this grant, we plan to set up a three year program, whereby the first year would be spent in organization and the second year would be spent in a tabulation of all types of injuries, from 10 schools in 10 different areas throughout the state. The third year, we would attempt using and trying to establish statistics from all of the Class A and Class B schools in the state. This would be done through the schools and would require an individual from the school submitting a simple form on each and all injuries.

Because of this, we are very anxious to see our faculty trainer program implemented so that trainers can cooperate in such a study.

## MANY BENEFITS

The benefits from such a study are many fold. From this, we can determine what our future programs should be. We can determine whether our primary injuries are due to lack of conditioning, poor field conditions, or poor equipment fitting and etc. When these things have been determined, we can better establish the type of teaching program that will best benefit the athletes of the high schools of Nebraska.

In the past, the only thing we have been able to gauge our program on concerns generalization. One of these generalizations has concerned the pre-season practice sessions and it is our feeling, and also the feeling of the Nebraska State Medical Society, that an additional week of practice should be allowed.

It is true that the way dates fall, approximately every ten years there are eighteen practice sessions prior to the first high school game, but at the same time, there is one year when there are only twelve practice sessions and if the weather should be adverse, this would be cut down more.

We would like to see the practices continue to start on the third Monday of each August, but to have the first game commence one week later in September and the season carried one week further into November.

The main objection to such a program is the delay in starting basketball practice, but one must remember that if the boy who is playing football has been maintained under an adequate conditioning program during the football season, he should be able to take his football suit off and go directly to the basketball floor and be in better shape than the boy who has not been participating in football that fall.

With the faculty member trainer's program, we still feel that the student trainer program, which has been established in the greater share of all high schools in Nebraska, should be and has to be continued. We feel the presence of a faculty trainer would add a great deal of maturity for the training room and enhance the judgment and performance of the student trainer. To help implement the faculty trainer program, the Athletics Injuries Sub-Committee for next August is planning to devote the entire program of its athletic injuries conference to conditioning and training for primarily the lay person, in cooperation with the University of Nebraska trainers.

It is hoped that through the school administrators, we can obtain cooperation in the development and establishment of the faculty trainer's program.

# Conditioning Procedures in Prevention of Knee Injuries

by George F. Sullivan, RPT*
*Trainer-Therapist, University of Nebraska*

The stability of the non-injured or rehabilitated knee under stress is dependent largely upon the musculature that crosses the knee joint. A conditioning program which attains and maintains a high degree of strength of this musculature throughout the joint's range of motion is primarily in the interest of preventing knee injuries.

The well conditioned athlete will usually spend the most time conditioning the lower extremities. In some of the sports such as baseball and track, there are people in charge of their programs that still hang onto the old paradox of the weight lifter who cannot run; the loss of efficiency is called being "muscle bound". These same people will say you are only as strong as your legs. Therefore, you can only be well conditioned by running. This is partially true as running builds endurance by repetition against light resistance, but increased strength is gained only when effort is greater than the normal activity.

It is the well conditioned athlete that takes advantage of the running, agility drills, isotonic exercise and isometric exercises that seems to be able to go through the season without being on the "Trainer's worksheet".

A daily routine of either isometric or isotonic exercises should be used in season along with normal training procedure. A high degree of prevention can be established with the use of "paired isometrics" and "isometric-isotonic exercises".

A good sound calisthenic program prior to all exercise programs is considered a must. This not only makes the muscles ready to react to stress but puts the athlete's mental participation into action. He will be stimulated, so to speak, towards the coming activities, or you may just call it the psychic readiness. Within this portion of the program, the stretching exercises to "loosen the joints" and the many coordinated drills are accomplished in order to bring all aspects of the body into the peak of readiness. Calisthenics directly relating to the knee are specially designed so as to bring the quadriceps and the hamstrings into play. We definitely do not want to over emphasize one group and get "muscle imbalance". This one thing could be a definite factor in many knee injuries.

## CALISTHENIC PROGRAM

*1. Squats—Standing position, hands out in front, feet spread to shoulder width. On count of one, participant goes to squat position; on count of 2 participant returns to standing position. 10 repeats.*

*2. Toe taps—Standing position, hands high above head, cadence count of one, touch toes; count of 2, return to starting position with a thrust upward on toes. 10 repeats.*

*3. Cross leg taps—Standing position with legs crossed, arms at side, slow cadence. On cadence count of one, reach down and touch arch of foot; on count 2 return to standing position. Repeat cadence only, touch opposite arch and return to standing. 15 repeats.*

*4. Paired stretch—Exerciser, standing on one foot places other foot in cupped hands of partner, leaning forward so as to approximate nose to knee slowly holding for count of 4. Return torso to upright position. Now he turns sideways and touches the ground on the outside of foot that is resting on the ground holding for a count of 4. Return torso to upright. Repeat procedure with other leg.*

*5. Long stretch—This procedure is not carried out to a cadence. Exerciser, from standing position, steps forward with right foot, keeping left foot stationary. He leans forward until he can grasp right knee that is bent to approximately 90 degrees. Return to standing and reverse legs so as to make the long stretch with the left leg.*

## PAIRED ISOMETRICS

To discredit and disuse an isometric program because there is a true lack of supporting data is the same as over interpreting any program until untarnished proof has been shown. The gauntlet of many of the isometric programs were tried and the one that readily acceptable by a team as a whole is one we wish to call "paired isometrics". The participants are matched up in fairly equal

*Presented at the Ninth National Conference on the Medical Aspects of Sports, sponsored by the American Medical Association, Houston, Texas, November 26, 1967.

size and if at all possible, same position. It is carried out every other day. In football, the offense one day, defense the next, throughout the preseason, and it is suggested off season.

The exercise is done on an eight (8) count cadence. The exerciser works in and works out of his exercise. In other words, he starts at about 50% maximum contraction and is at a full isometric by the count of three. He holds maximum to the cadence count of seven and then eases off so as to be out of static contraction at the count of eight. This falls in line with the theory that to get an effect that increases strength, at least two thirds of the maximum possible force must be exerted for four to six seconds.

The following are seven exercises used, especially for the musculature around the knees, every other day throughout the pre-season conditioning and during the season.

*1. Back lying, legs straight, heel off the ground approximately six inches. Force is applied at the foot upwards. First the right leg is exercised then the left.*

*2. Back lying, legs bent at hips and knees, so as lower legs are parallel with body. Force applied at ankles upward.*

*3. Prone lying, leg straight and about one (1) inch off ground, force applied at ankle and upward. First the right leg then the left leg is exercised.*

*4. Prone lying, legs straight, toes clearing the ground, partner stands between legs at ankle level. The force is applied at the ankles inward.*

*5. Prone lying, legs straight, toes clearing the ground. Partner stands on outside of legs at ankle level. The force is applied at ankles outward.*

*6. Prone lying (hamstring), knees bent 90 degrees, force is applied on heels. Heels are pulled toward buttocks.*

*7. Prone lying (quads), knees bent anywhere from 45 to 90 degrees. Partner has exerciser's ankles resting on his shoulders. The exerciser applies force so as to straighten out legs.*

Exercises 4 and 5 are carried out from the back lying position with the heels just off the ground. This depends on the over-all routine you are going through.

## ISOMETRIC-ISOTONIC

The isometric-isotonic exercises used on the days we do not use the "paired isometric" exercises are carried out with a piece of equipment which gives us controlled resistance. The exercise is started with an isometric contraction in which the player again works into his contraction by the three count—holds until the eight count then a partner holding the other end of the rope eases off so as to let exerciser go through the range of motion.

*1. Back lying (hamstring)—Leg flexed at hip, rope is hooked onto cleates of football shoes. Force is applied downward with the leg held straight.*

*2. Sitting position (rowing)—Legs in hook position force is applied in straightening out legs.*

*3. Standing (digging)—A harness is placed around the shoulders, attached to this is a 40 ft. rope. The player runs leaning into force of rope while the partner slowly lets rope pass through controlled resistance equipment.*

The isometric-isotonic exercise may also be carried out in the same manner the paired isometrics are handled. In other words, the partner holds the exerciser for his isometric count the same as the controlled resistance would and then allow him to take the limb through the remainder of the range of motion with resistance.

In conditioning procedures for the prevention of knee injuries, one cannot leave out the "proven-true" exercises such as those DeLorme and many others have suggested. This especially is true in those that have been rehabilitated either post traumatically or post surgically. By using the weighted boot, you find the maximum amount of weight that can be carried through full range of motion once. This amount is taken as 100%. Take half this weight and do ten repetitions. Take three quarters maximum and do ten repetitions. When you can accomplish ten repetitions, you increase your weight and usually you can do this with an increase of 2½ pounds of weight. Here again it is important to make note that you do both the quadriceps and hamstrings so as not to develop "muscle imbalance".

## SUMMARY

This program of "paired isometrics" and controlled resistance exercises is carried out in 20 minutes including the calesthenic program. No direct calibration of strength has been recorded, but the incidence of muscle strains and pulls and joint strains has been cut to a minimum. This still does not eliminate the blind side infraction that costs the opposition 15 yards.

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# P.N.F. In Athletic Training

by Dick Hoover, MS

*Trainer, Northwestern University*

What is P.N.F.?—Proprioceptive neuromuscular facilitation techniques strive to place demands on an area to secure a specific response or outcome. "Facilitation, be definition, means 1) the promotion or hastening of any natural process; the reverse of inhibition 2) specifically the effect produced in nerve tissue by the passage of an impulse. Therefore, the resistance of the nerve is diminished so that a second application of stimulus evokes the reaction more easily. Proprioceptive means receiving stimulus within the tissues of the body. Neuromuscular means pertaining to nerves or muscles. Therefore, P.N.F. are methods of promoting or hastening the response of the neuromuscular mechanism through stimulation of the proprioceptors." *

In techniques of facilitation the stronger parts are utilized to stimulate and strengthen the weaker parts. Emphasis is placed on applying the maximal resistance throughout the range of motion. Motion is applied first in the strongest part of the range, progressing to the weaker area of the range. The patterns of movement are mass movement in keeping with the characteristics of normal motor activities. In these patterns, the individual muscle contracts from its completely lengthened state to its completely shortened state in cooperation with the major muscle components of the pattern.

P.N.F. utilizes manual resistance. The resistance is applied opposite to action and at the distal portion of the area utilized in the pattern. A stretch stimulus and verbal stimulus may both be utilized in conjunction with traction (separating joint surfaces) or approximation (compressing joint surfaces). In general traction it is utilized in pulling activities and approximation in pushing.

How can P.N.F. be utilized by the trainer?

P.N.F. is a fine addition to Progressive Resistive Exercise, Isometric, and other forms or rehabilitation. Let us look at the post-operative knee. After the physician has designated initiation of rehabilitation, a progressive program is utilized. The Quadriceps and Hamstrings are utilized in a flexon –extension pattern. How often do we include the Tricep–Surae (Calf) musculature, Hip rotators, Sartorius, Adductor, and Abductors? These areas definitely could be atrophied due to limitation of use. By utilizing mass facilitation patterns with maximal overload, strength is developed.

The pattern which could assist in this strength development would be:

*1. Flexion—Adduction—External Rotation. With the athlete backlying, he pulls his foot in and up with the knee kept straight. (Hip, adductors, sartorius, and rotators are utilized) The resistance is placed on the dorsum of the foot and the pattern is repeated until near exhaustion. Remember you have a long lever arm, so the resistance the trainer applies will not need be great.*

*2. Flexion—Adduction—External Rotation (Knee flexed) Backlying, the athlete turns heel, pulls foot up and across body, and bends knee (Additional muscles used, knee flexors).*

*3. Same as #2, but adding knee extension.*

*4. Extension — Abduction — Internal Rotation. Athlete turns heel and pushes foot down and out—starting with leg raised, backlying, resistance applied on bottom of foot. The antagonistic extensor muscles are utilized.*

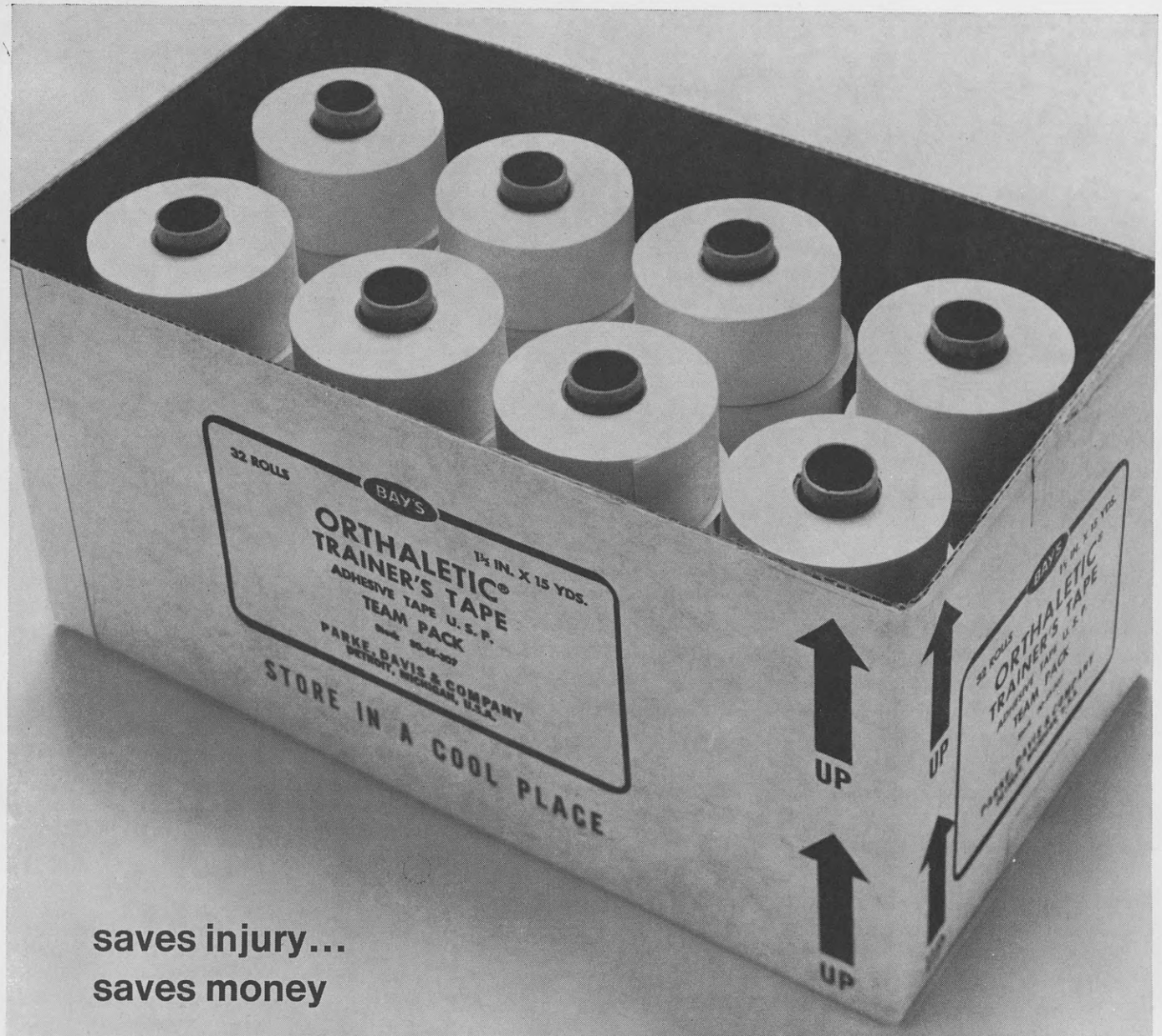
*5. Extension — Abduction — Internal Rotation (with knee flexed). Same as #4, except quadriceps extend knee through pattern.*

*6. Flexion—Abduction—Internal Rotation (with knee extenson).*

*7. Extension — Adduction — External Rotation (with knee extension). Knee flexion.*

As can be easily seen, if the athlete is resisted maximally through the length of the mass movement pattern, an increase in strength will be the resultant. This technique is not time-consuming, the athlete will be quite exhausted after 10-15 minutes of performance. It might be desirable to utilize P.N.F. on alternate days, with a P.R.E. program. The outcome will be a strengthened area. P.N.F. can be utilized for any extremity, trunk or neck musculature.

*Knott, Maragaret and Voss, Dorothy: *Proprioceptive Neuromuscular Facilitation,* Harper & Row, New York, 1965, p. 5.

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# Bits and Pieces

Clyde Stretch

". . . there was a dramatic play in which a defensive player intercepted a pass and started running for the goal line. He ran approximately 60 or 70 yards, exhibiting extreme exertion, and was finally tackled from the rear by an opponent. He fell to the ground after having been tackled in a manner which was not unusually hard. He immediately got up and was assisted by a couple of his teammates. He walked approximately 5 to 10 feet and collapsed. With this, the trainer and I immediately ran to his aid. He was found to be unconscious, and was quivering in a semiconvulsive manner; his mouth was clenched tight, there were no respirations, and the mouthguard was lodged in his pharynx. A screw-top mouth gag was used to pry open his mouth and the mouthguard was removed. The tongue was elevated by inserting a finger in the pharynx, thus maintaining an adequate airway. When this was done, it was noted that he did not breathe and he had no pulse audible or palpable. Accordingly, he was stripped of his jersey, his shoulder pads were cut away, and external cardiac massage was begun. Pulmonary ventilation was continued by mouth-to-mouth resuscitation until the respirator was again called to the field along with the ambulance. The respirator and external cardiac massage were continued even as the patient was transferred to the stretcher, to the ambulance and to the Health Center Emergency Room . . .

When his output and respiration were established as being adequate, he was transferred from the Emergency Room to the hospital ward where he received continuous attention. Improvement continued and all abnormalities seemed to disappear except for some continued blurring of vision and confusion.

Routine hospital care was given and on examination the following morning, the football player was in excellent cardiovascular condition; his cardiogram was normal, his respiration was good and his lungs were clear. His vision had improved to the extent that he had only a central scotoma and he was able to count fingers and recognize people. He remembered events of the first part of the game, but none after the initial start.

"The following morning the player was in excellent cardiovascular condition. He had cardiographic evidence of having had a myocardial infarct but exhibited no tendency toward arrhythmia or respiratory distress. His treatment was then continued in the routine manner for coronary artery disease with myocardial infarction.

". . . The student was able to finish the academic quarter, even though he had to reduce his course load. His electrocardiogram remained normal, his vision cleared one hundred percent, and his speech impediment was greatly improved. He still has slight difficulty in phonation, particularly if he is tired or tense . . .

**Summary.** 1) External cardiac compression may provide effective temporary circulation of blood and may, under certain circumstances, save life. 2) Associated patent airway and adequate ventilation is of prime importance. 3) Oxygenated blood must be circulated to the brain within four minutes if cerebral damage is to be prevented.

Minimum items of equipment required for successful cardiac resuscitation are mouth gag, airway, oxygenator (respirator or anesthesia machine) and defibrillator. Adjuncts to this basic equipment are those familiar to all of us in the emergency room, namely, monitors, intravenous equipment, and adequate emergency drugs."

The preceding were excerpts from: Cooper, T.Y.: "Contact Sports and Cardiac Injury: What a Team Physician Might Be Called Upon to Do," *Journal of the American College Health Association* 17:64-6; October, 1968.

* * *

Lindsy McLean, chairman of the subcommittee on certification by examination reports that the committee received approximately a 40% return on the active membership questionnaire dealing with topics which might be included in a certification examination. In general, the response seemed to be quite favorable. The committee, as of early May, was still in the process of evaluating the results and attempting to streamline the format. The results of the questionnaire thus far have been very valuable, with the committee weighing each individual suggestion. According to Lindsy, it is possible that further questionnaires will be necessary before the study is complete.

It should be remembered that all of the work by the subcommittee on certification by examination is but a single part of the work being done by the Professional Advancement Committee by authority of the Board of Directors who may alter any work, and must give final approval to the work done by the committee.

* * *

For those people who like to plan ahead, following this year's annual meeting in Cincinnati, the cities for future meetings include: 1970-Denver, 1971-Baltimore, 1972-St. Louis, 1973-Atlanta, and 1974-Minneapolis.

* * *

Two outstanding clinics were offered for high school student trainers and coaches this last winter, both deserving of praise. The Second Annual Training Clinic, coordinated by Wayne Rideout, was presented February 15 in Bryan, Texas. Some of the topics included in the program were, "Weight Training Prior and After Injury," "Emergency Treatment on the Field," and "Head and Neck Injuries." Hopefully, its success will allow it to continue to be an annual affair.

The second clinic, offered by The Keith, Academy and Bob Laucroft in Lowell Massachusetts could have been little less than excellent when presenting as speakers ten District One trainers and three physicians. Bob wanted to express his gratitude to all of those who worked so hard in helping to make the clinic the success that it was.

* * *

The Proceedings of the National Conference on Protective Equipment in Sports held at the University of Wisconsin on June 14-16, 1968 are now available. The cost is $5 per copy and may be purchased through Richard Hansen, The Continuing Program of Medical Education, The University of Wisconsin, Madison, Wisconsin 53706.

Paper titles include:

"What Injuries in Sports Can Be Prevented by the Use of Protective Equipment,"—A. J. Ryan, M.D.

"Status of Protective Equipment,"—C. J. Hale, Ph.D.

"Human Tolerance to Potential Injury in the Sports Environment,"—L. M. Patrick, M.S.

"New Designs, Processes and Materials for Use in Better Protective Athletic Equipment,"—F. M. Rappleyea

"Standards for Rating Protective Equipment,"—C. R. Kovacic, Ph.D.

The report concludes with general recommendations for sports and specific recommendations for specific sports.

## CALENDAR:

1. The second annual North American Trainers' School of Techniques will meet June 27-29 at Loyola University, Montreal, Quebec, Canada. Details may be obtained from Mr. Fraser Gleeson, 1708 N. Vermont, Oklahoma City, Oklahoma 73107.

2. The Committee on Sports Medicine of the American Academy of Orthopaedic Surgeons is sponsoring a postgraduate course in sports medicine July 28-30, in San Francisco, California. Further information may be obtained from Fred L. Behling, M.D., 300 Homer Ave., Palo Alto, California 94301.

3. The 1969 Conference on the Medical Aspects of Sports co-sponsored by The Medical Society of Virginia and the Virginia High School League will be presented on July 27 at the Coliseum of Virginia Polytechnic Institute, Blacksburg, Virginia. Questions may be directed to Earl S. Gillespie, Assistant Executive Secretary, Virginia High School League, Charlottesville, Virginia 22903.

4. The Third Annual Germantown Academy Symposium on Sports Medicine for doctors, school nurses, coaches, trainers, administrators and anyone else who would like to visit the place will be on August 14-15. Information may be obtained from David G. Moyer, M.D., Germantown Academy, Fort Washington, Pennsylvania 19034.

5. On August 21, 22 The Eighth Post Graduate Conference on the Medical Aspects of Sports will be offered at the University of Rhode Island, Kingston. Details may be obtained from A. A. Savastano, M.D., 205 Waterman St., Providence, Rhode Island 02906.

6. August 23 is the date for the New York State Osteopathic Society's Second Annual Athletic Injuries Seminar at the Thruway Motor Inn, Albany New York. Write E. Wayne Harbinger, D.O., Program Chairman, 87 S. Lake Ave. Albany, New York 12203 for details.

7. Another post graduate course is being sponsored by the Committee on Sports Medicine of the American Academy of Orthopaedic Surgeons on September 22-24 in Buffalo, New York. Information may be obtained from Joseph D. Godfrey, M.D., 77 Bryant St., Buffalo, New York 14209.

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## LIQUID MEALS

*(Continued from Page 8)*

conducted at the Greenhill School in Dallas, Texas, showed that over a ten-week period the varsity football players "gained an average of 5.6 pounds (ranging from 1 to 16 pounds)," and "none of the players lost weight during the observation periods."[1]

This study and others illustrate that with athletic trainers learning more about liquid meal products through clinical studies and through the efforts of manufacturers, training tables across the country will boast menus which include a liquid meal as an important factor in obtaining peak performances from the athletes.

[1] "A Liquid Meal for Football Players," C. James Krafft, M.D., and John Huges, *Athletic Journal,* March, 1968.

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# National Notes

JACK ROCKWELL, EXECUTIVE SECRETARY

In this, the last issue of the fiscal year, 1968-1969, I would like to reflect on some of the things I have noted and to speculate on the future of the NATA. It has been an extremely interesting year, and also a very busy one. Whether I hold the position of Executive Secretary, or someone else takes over, the Secretary can look forward to a busy and enlightening year ahead.

Traveling to District Meetings and other Allied Medical meetings, it has become increasingly apparent that in the main we have many members who are doing a great job of representing all of us to the public. Our image as Athletic Trainers has increased greatly in recent years and it is largely due to the good impression that you, as members, make on the public you come in contact with. It is indeed a great feeling to hear from our representative at the American College Association, Bobby Gunn, telling me that the physicians in attendance were truly interested in our problems and eager to work with us in the solution of our common problems. While attending the American Academy of Orthopedic Surgeons Symposium on Knee Injuries in Oklahoma City, I found the same acceptance and understanding among the Orthopedists. As a note of interest, there were sixteen athletic trainers in attendance. Along the same line, I recently received word that Hal Knowlton, Bill Linskey, Fritz Massman and J. Edward Noonan made an extremely impressive presentation at the AAHPER meeting in Boston. This is the type of thing that we all should continue to make ourselves conscious of and work at as hard as possible to continue.

As to the future of the NATA, this year's meeting in Cincinnati should be a key get together. The Professional Advancement Committee has made great strides this past year and their report to the Board should bring the advent of Certification much closer to realization. The Ad Hoc Committee has been working on structural re-organization and has compiled a report that should give us some much needed help and direction. The matter of developing a better Journal will be discussed and I sincerely hope something good will come from this.

Other matters that have been worked on during the winter and will come up for discussion at the National Meeting are as follows:

1. Possible establishment of a National Placement Bureau. The District Secretaries will man a booth at the National Meeting to help those seeking employment, or employers seeking athletic trainers.

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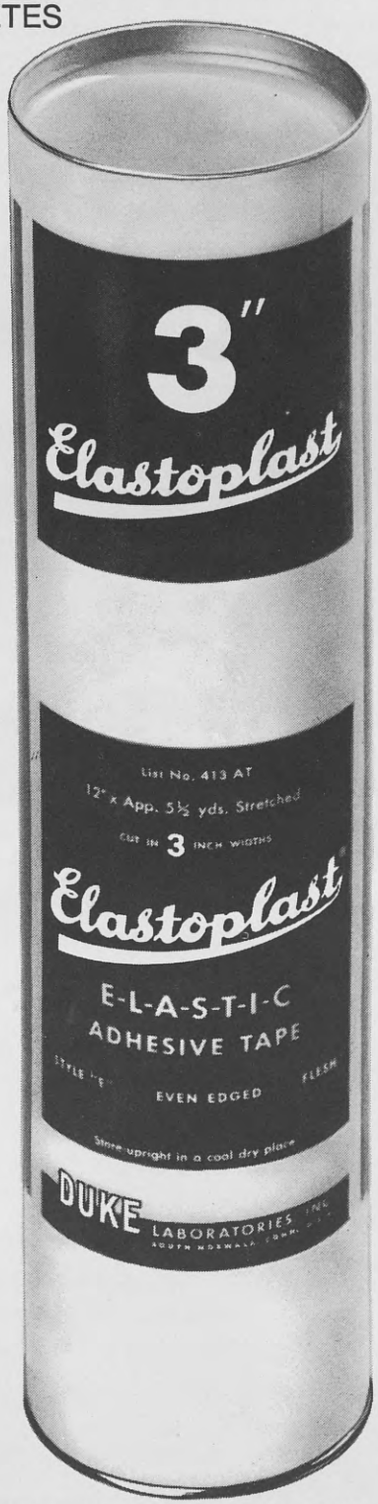


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2. Possible change in the management of the Annual National Meeting.
3. Further clarification of the By-laws, particularly pertaining to membership status.
4. A proposal will be discussed to bring about the National Collection of dues.
5. The discussion of several new forms, including a new application form and biographical form, will be presented.

All in all, it has been a good year and I firmly believe that with action being taken on some of the above proposals the NATA will continue to grow and prosper.

My thanks to all for your cooperation and help during the past year.

## Principles of Athletic Training

*Modern Principles of Athletic Training*, Second Edition, by Carl E. Klafs, PhD, FACSM and Daniel D. Arnheim, DPE, FACSM Reviewed by Clyde Stretch, Michigan State University, East Lansing, Michigan

This book follows its predecessor by six years and a dollar and twenty-five cents. Its predecessor was a fine athletic training text, but a single addition makes this new edition well worthwhile. Each chapter of this second edition offers a reference bibliography and a list of recommended readings, for the first time allowing the reader to explore athletic training beyond the scope of the text with relative ease.

The book continues to be unique in its offering of a chapter dealing with "training for girls and women." Although the chapter spends most of its space negating the myths in the field of girls and women's athletics, a chapter would probably not be necessary to discuss training procedures unique to this area. It is, however, one of the very few places where the research in this field has been compiled for a single presentation.

A third feature that no other book on athletic training now offers is a supplemental instructor's test booklet. The booklet provides over 700 questions dealing with the text. Some of the questions presented are excellent, but some, too, are trite. There are some misprints in the answers to some of the questions; and some of the questions are in error (e.g. multiple choice questions #3 p. 43 and #2 p. 23). It would be best to evaluate each question in the booklet for its own merits.

Some minor additions include the AMA's guide for medical examination and brief sections in cryotherapy, altitude, weight control, acclimitization, heat exhaustion and stress, and conditioning for wrestling and skiing.

Although there are still sections of the book which could have been dealt with in greater depth, *Modern Principles of Athletic Training* would still have to be, at present, classified as the most thorough book on the market dealing with athletic training.

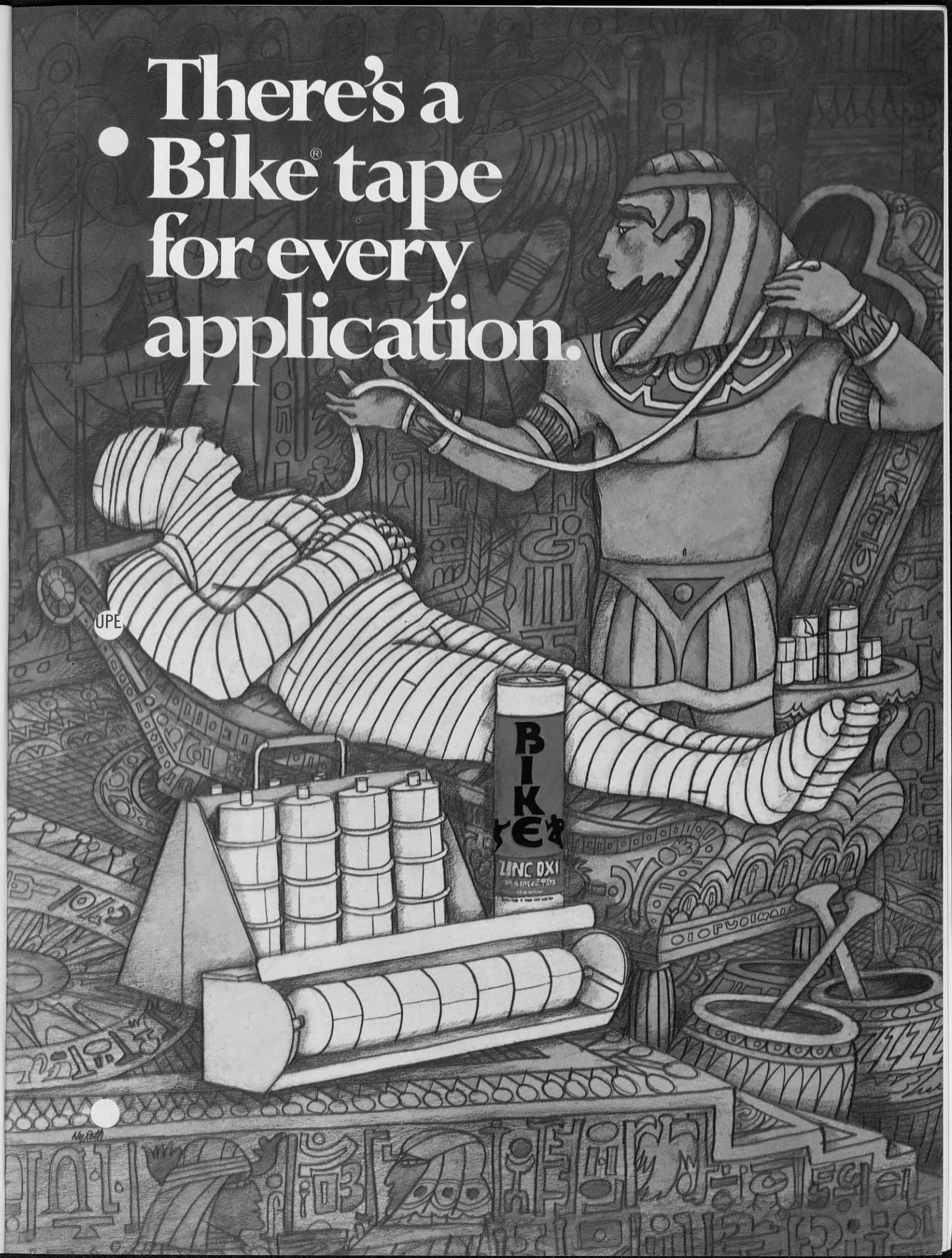
The book is published by the C. V. Mosby Company, St. Louis, Missouri (Literature available from the publisher on request).

## Recent Athletic Training Literature

This list is generally restricted to those areas of specific interest to the athletic trainer. Topics belonging to the broad areas of athletics, physical education and physical therapy will usually be omitted.

Allen, M. L.: "Air Force Football Injuries, A Clinical and Statistical Study," *Journal of the American Medical Association* 206:1053-8; October 28, 1968.

Carr, R. E.: "Soft Tissue Injuries," *Athletic Journal* 49:33+; January, 1969.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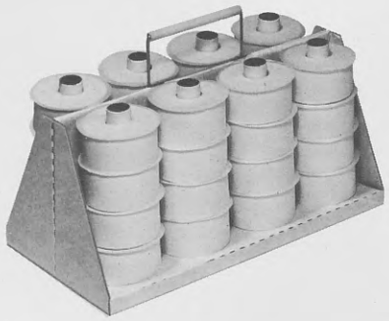

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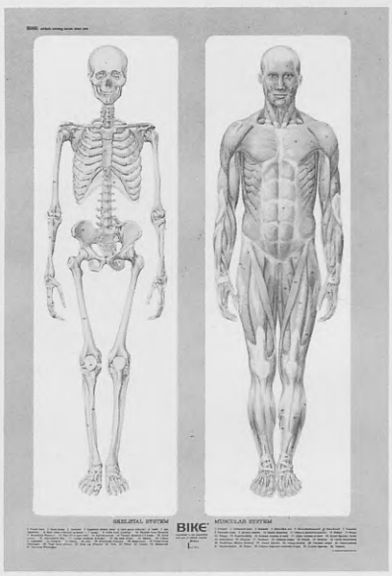

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specialists in the prevention and care of athletic injuries.

Chang, A. R.: "The Problems of Winter Sports Injuries," *New Zealand Medical Journal* 67:607-10; June, 1968.

Clarke, K. S.: "Quackery and Sports," *Ohio Medical Journal* 64:913-20; August, 1968.

Fardy, P.S.: "Preventing Heat Illness," *Athletic Journal* 49:62+; September, 1968.

Ferencz, C.: "Cardiovascular Screening for School Athletics," *Journal of School Health* 38:483-9; October, 1968.

Field, R. J., Jr.: "The Physician and Athletics," *Journal of the Mississippi Medical Association* 9:481-2; October, 1968.

Furst, W. D.: "Athletics, Blood Pressure and Coarctation of the Aorta," *Texas Medicine* 64:40-1; September, 1968.

Gurdjian, E. S., et al: "Significance of Relative Movements of Scalp, Skull and Intracranial Contents During Impact Injury of the Head," *Journal of Neurosurgery* 29:70-2; July, 1968.

Hughston, J. C.: "Subluxation of the Patella," *Journal of Bone and Joint Surgery* 50A:1003-26; July, 1968.

Ljungquist, R.: "Subcutaneous Partial Rupture of the Achilles Tendon," *Acta Orthpedica Scandinavica* Supplement 113:1+; 1968.

Macnab, I., et al: "Rotator Cuff Tendinitis," *Canadian Medical Association Journal* 99:91-8; July 20, 1968.

Polk, R. G.: "Frequencies and Causes of Baseball Injuries," *Athletic Journal* 49:19-20+; November, 1968.

Ramsay, R. A.: "Mallet Finger," *Lancet* 2:1244; December 7, 1968.

Rawlinson, K.: "General Treatment Rules; Contusions, Strains, Sprains," *Scholastic Coach* 38:88+; September, 1968.

Savastano, A. A.: "The Team Physician and the Law," *Rhode Island Medical Journal* 51:558-60+; September, 1968.

Slocum, D. B., et al: "Mechanics of Running," *Journal of the American Medical Association,* 205:721-8; September 9, 1968.

Spence, W. R., et al: "Prevention of Blisters, Callosities and Ulcers by Absorption of Shear Forces," *Journal of the American Podiatry Association* 58:428-34; October, 1968.

Anon.: "Convulsive Disorders and Participation in Sports and Physical Education," *Journal of the American Medical Association* 206:1291; November 4, 1968.

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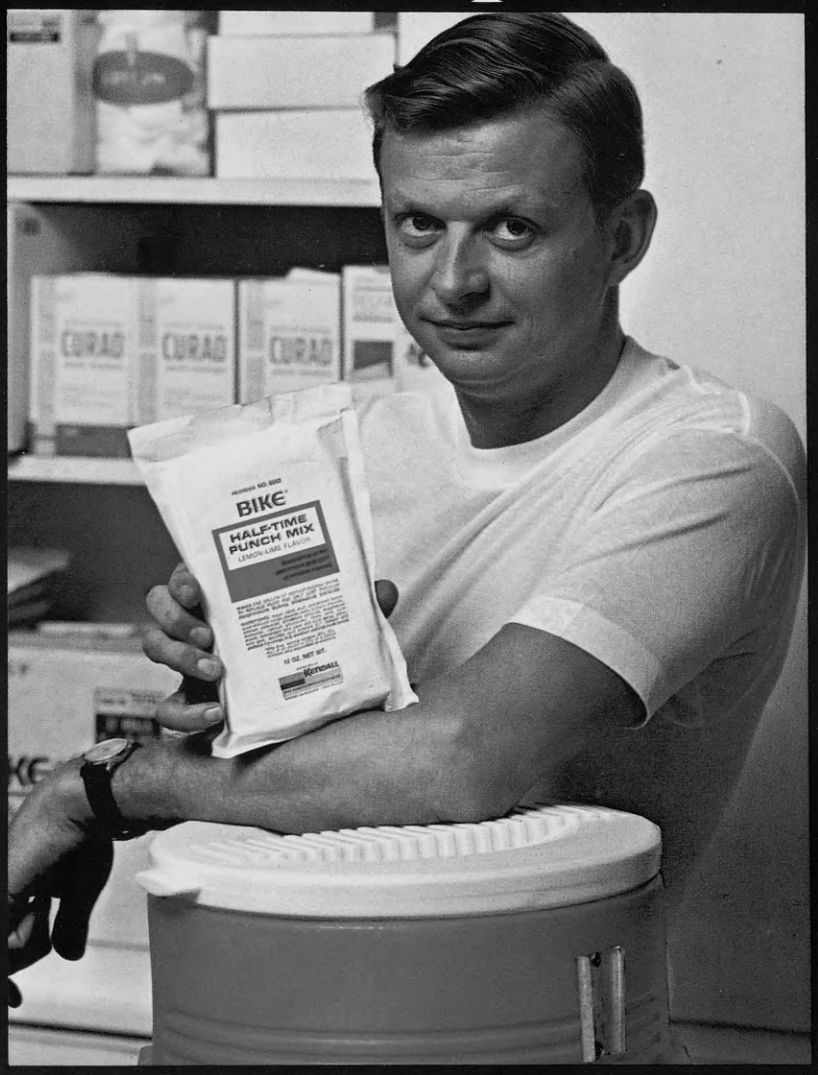


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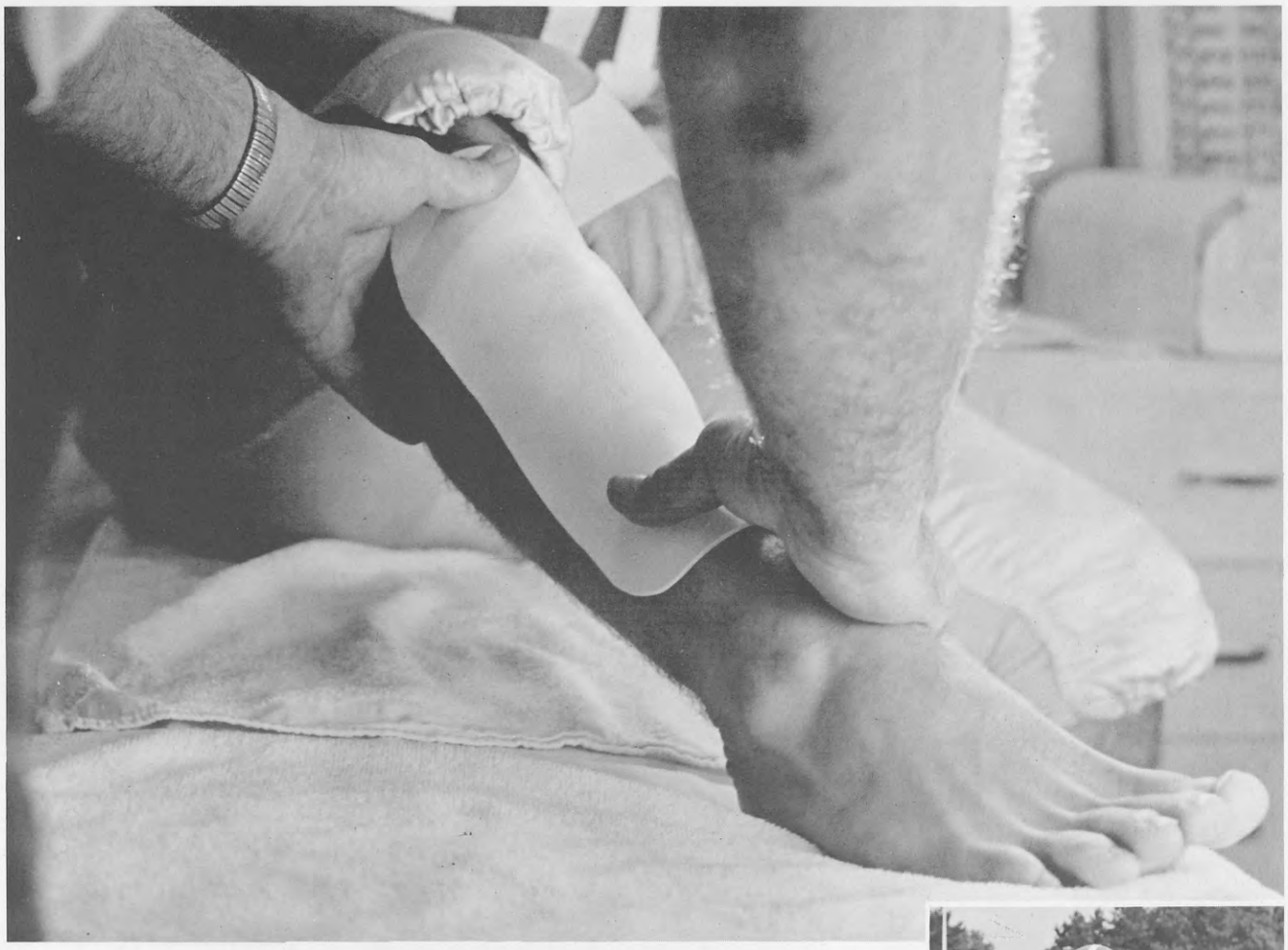

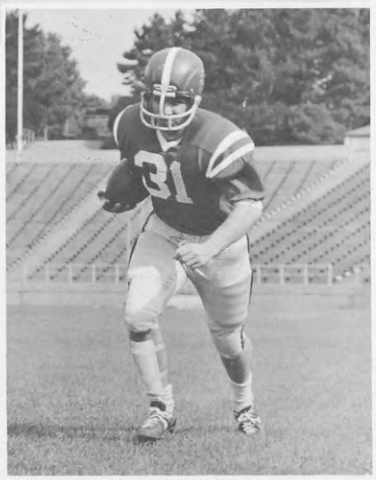

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Now you can disinfect the water in your whirlpool baths and tanks with a powerful, new microbicide—BETADINE WHIRLPOOL CONCENTRATE.

Used as directed...BETADINE WHIRLPOOL CONCENTRATE promptly reduces bacterial contamination of water and kills iodine-susceptible microorganisms in the bath...including Pseudomonas strains, *E. coli* and staphylococci.

It is a unique germicidal iodine-complex—nonionic, nonstaining to skin, mucous membranes, and to natural fabrics...virtually nonstinging and nonirritating. BETADINE WHIRLPOOL CONCENTRATE disinfects water, whether bacteria are present at the time of filling the tank or during use. What's more, it is economical. As a rule, one fluid ounce of BETADINE WHIRLPOOL CONCENTRATE disinfects about 20 gallons of water. *Supplied:* One (1) gallon. *Also available:* Dilution chart giving specific amounts for various tank sizes.

**Purdue Frederick**

The Purdue Frederick Company, Yonkers, New York 10701

## Betadine Whirlpool Concentrate
(povidone-iodine)

## for effective disinfection of bath water prior to and during physical therapy procedures