

ATHLETIC TRAINING

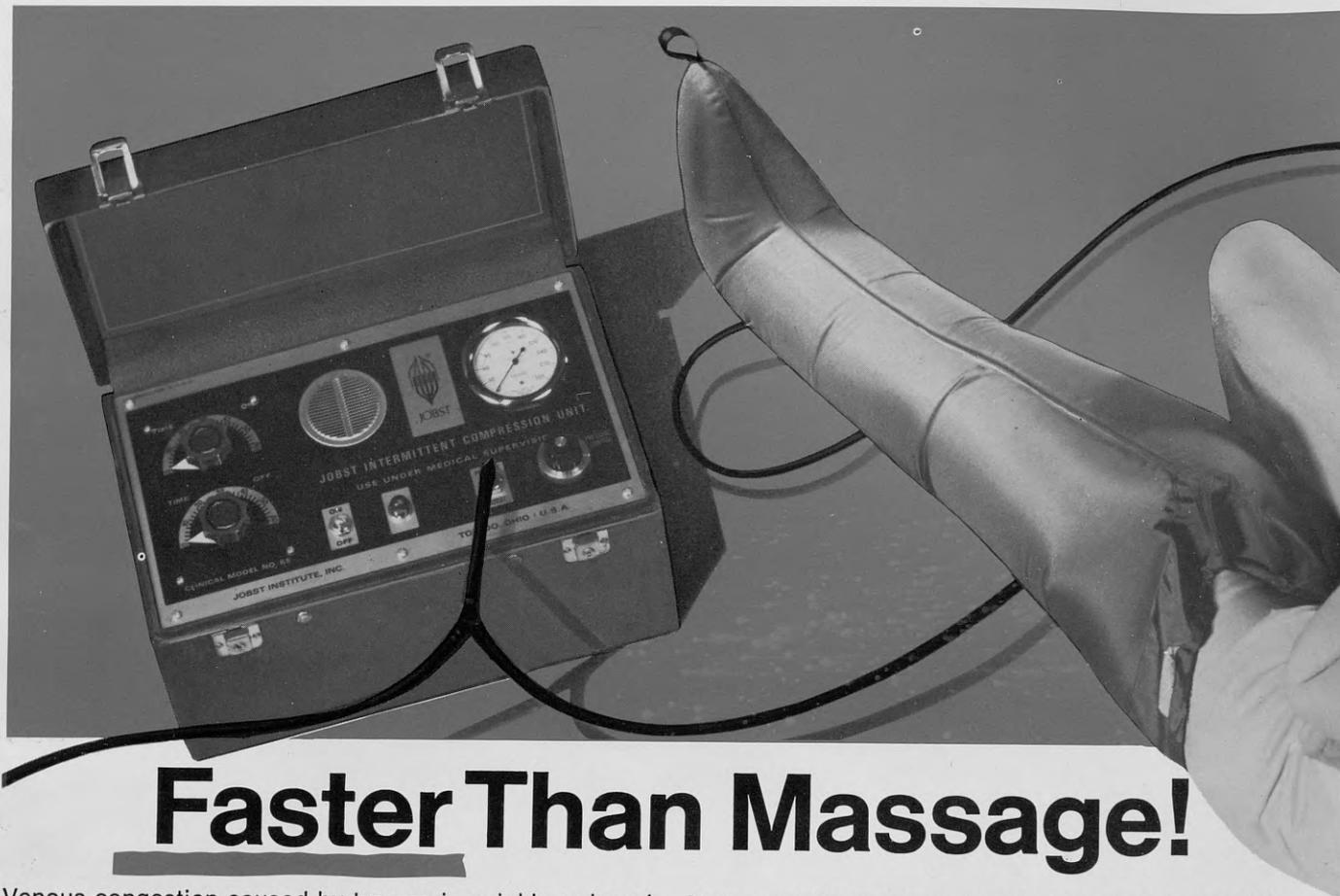
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OCTOBER 1972

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BLISTERS AND MOLES
ANKLE TAPING
NATA REPORTS



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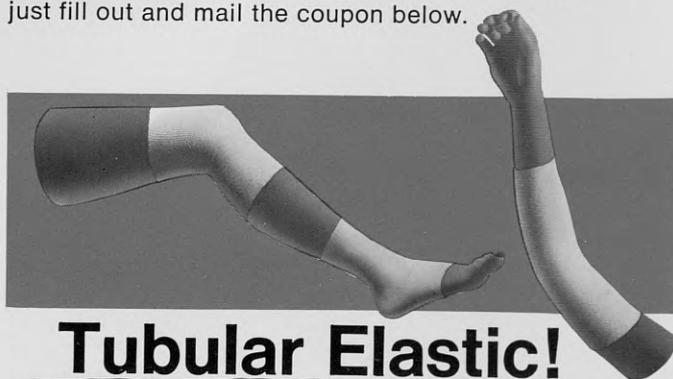
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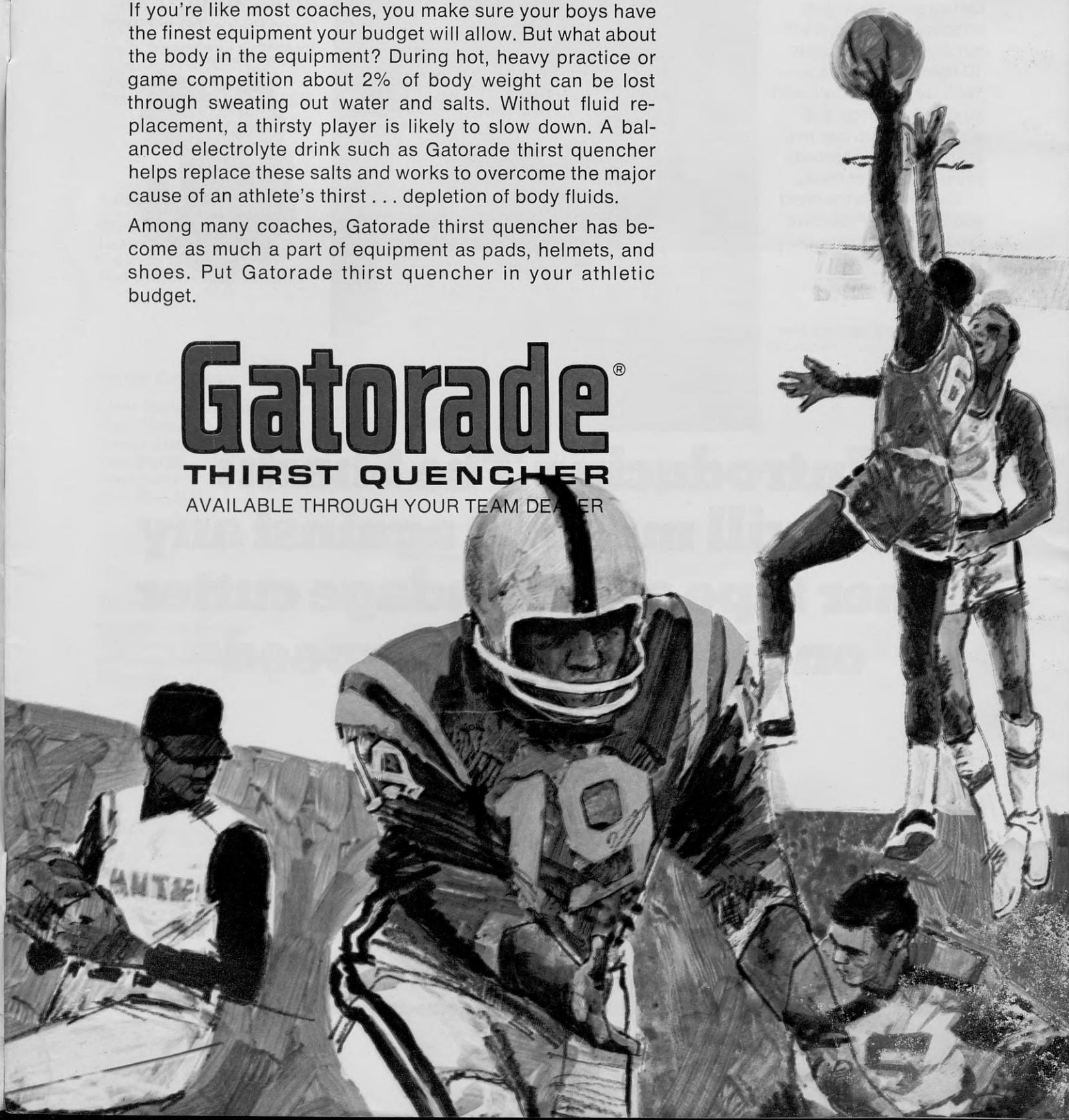
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ATHLETIC TRAINING



THE JOURNAL OF THE NATIONAL ATHLETIC TRAINERS ASSOCIATION

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Research Design and the Athletic Trainer

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In high school, in a course entitled Music Appreciation, I recall the teacher explaining that while few of us will have the opportunity or ability to develop more than recreational expertise in singing, playing an instrument, or songwriting, all of us would be exposed to hearing music in various forms throughout our lives. She then proceeded to teach us the ingredients of music so that we could "discern" and thereby "appreciate" as consumer-experts what was "good music." It was surprisingly interesting to learn that music had an anatomy and physiology, that it could be dissected, that its revealed components could be seen to function in a variety of combinations, and that I as a non-musician could come to discern within my own interests not only *whether* it was good music but—more important—*why*.

There is a strong parallel between what I experienced as Music Appreciation and that which should be in all professional education: *research appreciation*. Few of us will have the opportunity or develop the competence to be research experts, while all of us must be consumers of scientific articles for the duration of our professional lives. Yet too many of our professional education efforts relative to research are not geared accordingly. They are notorious for handing down pronouncements on "what" and "how to" but not "why." Students are handed statistics as arithmetic computation exercises and published articles as research findings. They may then be handed a "good" research design—that is related to the instructor's pet projects. This is like learning how to tape a joint without knowing the mechanism of injury involved, the significance of the injury, what alternative taping procedures and relevant supportive treatments are available, why this taping procedure, and how could we evaluate its effectiveness.

The result of such orientation to research in professional education is that one tends to consider research synonymous with statistics and "proof" with publication. This has two implications. First, since the calculus of statistical formula derivations, found in all statistics books, is beyond our comprehension, a statistic tends to be given ethereal

status. ("It is a statistic; therefore, I cannot understand it.") Consequently, it is either unquestionably adopted in reverential faith (if it agreed with our opinion) or summarily rejected if not attacked as blasphemy (if it conflicted with our opinion). The second implication is that the practitioner—a decision-making professional such as the athletic trainer—is not given the ingredients of research in a manner that reveals not only his ability to discern good or bad research findings, but also his vital role in contributing to good research design.

STRIPPING THE MYSTIQUE FROM RESEARCH

I would like to hazard into the deadly topic of research design in this vein, not to produce researchers but to instill a meaningful appreciation for the physiology of a statistic. By physiology is meant we are more interested in a statistic's function than its structure. The athletic trainer, like other practitioners, is a pragmatist. He makes judgmental decisions based on those facts and alternatives available for him. He does not need to have the luxury of conclusive statistical proof, for a decision is an action, not a conclusion. Yet while the researcher can reserve his opinion of what constitutes fact, a practitioner must declare some opinion of fact in order to act. And, unlike the researcher, the practitioner must accept whatever problems come his way. He must do this with full knowledge that each action constitutes a historical fact, the result of which is irrevocable and the evaluation of which forever must be hindsight. This requires a discerning as well as courageous professional.

To bring the practitioner closer to a state of research, appreciation requires two steps: first, to strip from research the awesome mystique adhering to it; second, to rebuild through functional understandings the nature of research design and the athletic trainer's stake in it. To strip away the ethereal qualities of research and statistics, consider the following expressions of some who are recognized as research analysts:

"Probably the most basic myth about research is... this tendency... to expect research to provide absolute truth and absolute imperatives of action... The successful theory is merely one that is tested and escapes being *disconfirmed*. The results of research *probe* but do not *prove* a theory." (1)

"Less than one per cent of research workers clearly apprehend the rationale of the statistical techniques they commonly invoke." (2)

"It is fortunate for research investigators' peace of mind they seldom or never read in statistical journals what statisticians say to each other." (3)

"The predominant characteristic of our universe is variation—differences between things to which we attach the same label... Statistics is the science and art of dealing with variation... If nearly everyone who contributes to medical journals is doing biometry (measurements of variations in man), then biometry is not in a very healthy state." (4)

"Ten medical journals... that are read frequently and considered by physicians to have excellent reputations... were subjected to an abbreviated but intensive critical reading by a competent biostatistician with experience in reviewing scientific publications... Among the 149 analytical studies (i.e., not case reports) critically evaluated, in 73%... conclusions were drawn when the justification for these conclusions was invalid." (5)

"The bulk of the studies in sports commonly considered 'accident prevention research' would be more appropriately identified 'accident research.' That is, research that has been done in sports safety, more often than not, has terminated only in the identification of a problem or preventive measure. The discussion and conclusions of the investigation may have gone further, but the research had not." (6)

Through the above stripping job, we must be careful that we are not digging beneath the veneer of superficiality and gouging the real substance of research as well. Some researchers as well as practitioners are too ready to utilize any opportunity to criticize statistical logic and research discipline to defend their own laziness, carelessness, bias, or naivety. To borrow from a quote that appeared in *Lancet* 80 years ago, "The true and sufficient reply to the oft-quoted allegation that one can prove anything by statistics is that without them one can prove nothing." (I'd like to make one editorial modification of that statement: "...without them one can *learn* nothing.") More recently and to our interests:

"From the scientific standpoint, the effects of sports on health are largely unknown... We know more about the short- and long-term

effects of smoking or of maternal rubella than we do about the beneficial and injurious effects of recreational activities, even though these occupy the time of millions of adults and children. Scientific methods of study are not lacking but have not been applied." (7)

The suspicion status given statistics is natural and not necessarily a deterrent to the proper development, scrutiny, and utilization of research. In fact, such suspicion *with bias removed* (let's call this *critical curiosity*) is the first requisite for appreciating the physiology of a statistic. The second requisite—scrutiny of its function—warrants our leaving the world of quotes and returning to the significance of research design in peoples' words.

ANATOMY OF RESEARCH

Research can be dissected into five ingredients: (1) A curiosity. (2) The collection of the observations bearing on the curiosity. (3) The organization and treatment of the observations. (4) The generalizations merited from the treatment. (5) The new curiosities generated by the generalizations. (In the following examination of these ingredients, the reader is encouraged to apply the thoughts to some familiar sports medicine problem such as artificial turf.)

1. *A Curiosity*. The conscientious practitioner is constantly in pursuit of "truth" (fact). A fact is what we assume to be truth, doctrine is what we teach as truth, etc. Essentially, man relies on his own experiences as revealing truth. ("It happened to me; therefore, it is a fact.") He turns to the experiences of others who he considers authoritative when his own experiences are too limited to reveal truth. These experiences of others are obtained from personal communications, conference speeches, and the literature. When the practitioner senses gaps, inconsistencies, or disagreements in what is offered as truth, he turns to research with a curiosity. The curiosity, if structured so that it is measurable, becomes a hypothesis.

Unfortunately, this is inadequate for qualifying as *critical curiosity*. Psychology reminds us that what man perceives of his environment and experiences as truth is unique to himself, being to some extent a product of his previous perceptions. The educated man therefore is he who realizes he has a fickle and abridged understanding of his experiences, as does everyone else. The educated practitioner therefore will turn to research more often (if he could find it) because he possesses a critical curiosity concerning the real meaning of *his* experiences and those about him. ("Is what I've experienced a universal truth or an oddity?")

2. *The Observations*. The curiosity that provokes

research requires an objective and systematic pooling of observations. Only by sharing our respective perceptions can we find the nature and extent of agreement among our respective interpretations of truth. The words "objectively" and "systematically," however, are vital. By objective is meant that we must declare *in advance* that which we shall observe, the criteria for selecting and valuing these observations, the instrument to be used in the selection and valuing process, and the definitions of the words and numbers used to record our observations on paper. By systematic is meant that we declare in advance also the procedure for awaiting and recording observations and thereafter ensuring complete compliance with that procedure. The criteria, instruments, definitions, and procedure together constitute research design.

3. *The Treatment.* At this point, the researcher has acquired data, not statistics. Data are bits of information (recorded observations). Statistics are mathematical treatments (manipulations) of the data—in function, a shorthand system for analyzing data. The four primary uses of this shorthand are (1) to locate the most representative perception (e.g., mean, median, mode); (2) to reveal the spread or variability of the perceptions (e.g., range, standard deviation); (3) to indicate the degree of association with other accompanying observations (e.g., correlation); and (4) to register the degree to which chance may account for the differences in the observations obtained (e.g., *t* test, chi square). Each statistical method can be used only if the circumstances surrounding the nature and source of the data satisfy the assumptions from which the statistical formula was derived. This requires statisticians to be as careful and professional in their decisions as practitioners.

4. *The Generalizations.* With the statistical treatment of the data completed, the investigator has the right to generalize, to project the meaning and implications of his findings. However, within this right is the obligation to be consistent with the characteristics of the research design and the limits of the measurement instruments and statistical methods employed.

Central to this generalization is the meaning of the words "population" and "sample." By population should be meant *first and primarily* the subjects actually measured. The investigator must *first and primarily* generalize only as to the nature and significance of the data obtained from the actual people observed. *Then, if* the research design had described in advance of subject selection that the resulting selection will be in effect a legitimate sample of a larger and definable population, the investigator may extrapolate cautiously from his

findings to that larger population as well. In other words, no investigator has the right to generalize from his findings to any population beyond his actual subjects unless he has satisfied in his design the very stringent and necessary rules of the sampling process.

5. *New Curiosities.* If one comes to take seriously the preceding paragraph, it should be far easier to understand why research yields more questions than answers. The generalization has restrictions to preserve the role of research in testing truths systematically and objectively. Without such restrictions, we have an editorial instead of a research paper. There is nothing wrong with an editorial (expression of one's opinion); but it cannot be confused with a research finding generalization. One can accept or reject another's opinion as one wishes, but one cannot ignore a legitimate research finding if it is relevant to one's curiosity.

The secure investigator therefore generalizes on that which he can, and then may offer *conjecture* on that which has implications for consideration but lies outside the research design or population. As conjecture is in the form of a question rather than conclusion, the investigator can use this route to pass on an interesting possibility to his readers. As conjecture is a curiosity, it accomplishes its prime mission as an ingredient of research: it triggers the onset of needed research activity.

PHYSIOLOGY OF STATISTICS

If one can come to "appreciate" the preceding paragraphs about the significance and limitations of research, he can understand why research design is of too vital importance to progress in decision-making to leave to researchers. If the practitioner continues to rely for "truth" on the conclusions of a study rather than its design, he is by default leaving "progress" to those who are seldom held accountable in the decision-making process.

In explanation, it can be seen by dissecting research that the function of a statistic is manipulative convenience. Put more bluntly, a statistic cannot improve on the data provided for manipulation. Working backward, the data are no better than the procedure and criteria for selecting and collecting observations (research design). The research design in turn emanated from a particular curiosity and the rationale that led to its structured hypothesis. Working ahead, the generalizations based on the statistical results cannot exceed the characteristics of the subjects observed nor the observations selected for scrutiny.

Consequently, if the practitioner demands a thread of consistency from curiosity through the research design to generalization for his method of evaluation, he has distinct advantages in analyz-

ing a published research report and in assisting a proposed research design. In critically examining this demand, his advantage is that he cannot be "snowed" too readily. He is aware of his decision-making problems and is in earnest pursuit of the "real truth." He is acquainted with currently available alternatives restricting his decision-making process and some of the opinions regarding the relative worthiness of each alternative. He knows the general population from which subjects are to be drawn if the design is to be relevant and is all too aware that there can be great variability within that overall population. He also has some ideas as to when a particular observation desired can be obtained from the subjects and still be representative of the curiosity involved. He has a good idea of the limitations in the meaning of the words used in the process.

There still is a role for the researcher, and that is to bring the competence of knowing how to package objectivity and systemization in the research design, how to sample, and how to utilize the measurement instruments and appropriate statistical methods. But this role must be predicated on capturing the decision-alternatives of the practitioner in the hypothesis and design so that the findings will present the smallest gap possible in the application of the generalizations to real life.

EPIDEMIOLOGICAL CONSIDERATIONS

As a summary to research appreciation, comments on the research model "epidemiology" seem appropriate. Epidemiology is the study of frequencies of characteristics in a population. It acknowledges as its basic assumption that these characteristics will vary within a population, and thereby its interest is in revealing that which influences a rise or decline in the frequency of a given characteristic.

Epidemiology is seldom discussed in "HPER" research references. Our research education is largely confined to the "physical science" model in which we establish controls over certain variables, record observations affected by an experimental variable, and form conclusions on the influence of the experimental variable. Our heritage with this model is revealed in the common connection of "research" with "experiment."

There are definite advantages in thinking epidemiologically about research in sports medicine. The experimental phase is still a very important avenue for research, but is seldom close to the competence and decision-problems of the practitioner. Epidemiology, like the practitioner, deals with reality. It studies people under the conditions of life, not in the contrived world of the laboratory

experiment. ("The best estimate of head injuries in football is the number of head injuries in football.") Even if the laboratory produces something considered effective, it needs to be studied among the living to ascertain its real influence.

In further explanation, there are certain demands within epidemiology that merit final emphasis in summarizing this orientation to "research appreciation."

1. *It requires a functional definition of "population."* This has already been alluded to under *Generalizations*. The generalization on findings must be directly in accord with the characteristics of the subject observed. Consequently, research design should be meticulously attentive to the rationale for selecting its research population.

2. *It requires a precise functional definition of the characteristics being measured.* With ambiguous definitions of terms such as "accident," "injury," "disability," etc., how can any investigator or reader know what is and isn't being measured? Subsequently, of what use is a generalization on findings derived from loosely collected observations? If the characteristic is to be observed and collected with meaning, its definition must elicit mutual understanding. Further, this definition must be relevant to the curiosity that began the research process.

For example, if the curiosity is the frequency of disabling injuries in football, the definition of disabling injury (preferably in two or three grades of severity) needs to separate out the nuisance injuries that do not interfere with performance. If on the other hand the curiosity is the effectiveness of a particular piece of equipment, *all* observed injuries (i.e., those requiring attention before return to participation) related to that equipment need to be recorded. The rationale for this is subtle but important: we need to learn the number of nuisances as well as more serious injuries in order to evaluate whether they (the nuisance ones) could have been more serious were it not for the equipment.

3. *It requires consideration of normal variation in the frequency of a characteristic.* Epidemiology allows for normal cyclic variations of a characteristic in a population (*endemic* levels); unusual rates (*epidemic* levels) cannot be ascertained without determining first what is normal. A practitioner in sports medicine does not need be reminded that characteristics often are observed in bunches. Consequently, epidemiology research must remain in effect over a sufficient period of time to discern the differences between normal random bunching and bunching due to a definable influence. The time required is related to the level and variation in frequency rates that past experience hints as endemic. Injury rates in sports, as a rule, for example, re-

quire at least three years to demonstrate this difference. A pilot study, however, can break this rule, for its hypothesis is only to test a curiosity whether further research is justified along certain lines.

4. *It makes a conclusion a very difficult generalization to be attempted.* Since man is a highly variable animal, and factors affecting him are not only equally variable but also transient ("The qualities of an artificial surface will change over time and use."), "conclusion" can be considered a dirty word. "Conclusion" infers that the results are unquestionably accurate and that the curiosity has been absolutely resolved. It tends to lead to inflexible opinion instead of critical curiosity, to defensiveness instead of healthy sharing of concerns and reservations. It sometimes leads to professional cheating by ignoring results that don't agree with consensus or omitting if not doctoring findings to maintain a conclusive posture.

It is my personal opinion that the requirement calling for conclusions in most thesis programs and many journals is the single most detrimental deterrent to research appreciation. It provokes the opposite of what starts and ends the research process. It forces the budding researcher and practitioner to think he must arrive at a firm opinion of scientific fact based on a few subjects and other limitations

because of a statistically significant difference. ("The study has its limitations. However, . . .") It cheats practitioners out of their desired interest in research: an unending series of unbiased reflections of truth on matters important to his decision-making responsibilities.

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Athletic Dermatology—Fifth in a Series

Blisters—Moles (see next paper)

L. W. Stauffer, M.D.

Eugene, Oregon

The human skin is a laminated structure that is elastic to a point. Stress beyond that point will produce either a tear or a blister. Our skin appears to be weakest where the epidermis and dermis join. Several types of stress on the skin can cause a separation at this junction, resulting in the formation of a space that fills with serum and blood—a blister.

The most frequent shearing skin stress in athletics is the force on the sole of the foot generated by quick stops and direction change. If there is excess room in the shoe or athletic socks are too thin, and, particularly, if some sticky substance such as compound tincture of benzoin is on the skin, the skin stops quickly against the shoe insole, deeper tissue slides beyond the skin surface forcing a separation of tissue layers. Into this space serum is poured. This same mechanism applies to the hands of crewmen, gymnasts, pole vaulters, weight and discus men, and inexperienced garden rakers.

Back and forth or up and down friction from stiff shoes and firm or rigid body padding can produce the same shearing effect with less force exerted over a longer period of time.

A much deeper separation of layers occurs in the pinch injury, such as that experienced by catching skin in a pair of pliers that suddenly slipped off whatever was being gripped. These blisters are almost always bloody. Occasionally a cleated shoe planted by some thoughtful competitor on the edge of the hand, arm, or leg produces this injury.

Recognizing a traumatic blister is not difficult. They hurt rather than itch, are sharply localized but may vary in shape and size in relation to the direction, amount and area of force producing the lesion. There is a relatively thick layer of skin in the blister top compared to vesicular lesions seen in contact dermatitis and other less common skin disorders such as dermatitis herpetiformis, pemphigus, and erythema multiforme. There is usually

a thin rim of redness around traumatic blisters, but not much swelling.

How you manage a blister can make considerable difference in the length of time of healing. Do not cut the top off. Wait 5 or 6 days for new skin to develop on the blister base and there will be much less problem with secondary infection or additional blistering. Do not use benzocaine or novocaine as pain relievers. These compounds are good sensitizers and can add an allergic eruption to your problem.

For the acute, painful blister, remove some of the serum with a sterile syringe, replace $\frac{1}{4}$ to $\frac{1}{2}$ of the serum removed with a mixture of zyllocaine and injectable steroid. Cover with a fluffy dressing, surround with a firm dressing and tape into place. Keep the area similarly protected during the healing phase. Less severe blisters will respond to a lidocaine-cortisone cream used locally 4 or 5 times a day.

If secondary infection develops it should be handled as any cutaneous infection (see section on abrasions and impetigo). If an athlete continues to develop blisters he should be examined for the possibility of underlying skin disease.

The best treatment is prevention. Once the skin toughens up by formation of callus there is much less blistering tendency. It is important to follow a program of gradually increased "load" on the skin, whether it be running, jumping or gripping with the hands. There is no substance that on application to the skin makes it tougher. Most of the so-called skin tougheners are compound tincture of benzoin. This only makes the skin stickier, not tougher, and can lead to more severe blistering.

Shoes should be fitted, not issued (Fig. 1). Too much or too little room in the shoe leads to blisters. Athletic socks are poor protectors when thinned out from wear. Break game shoes in during practice sessions. Poorly adjusted or fitting protective

equipment should be corrected. Cotton T-shirts or similar garments will also help prevent friction on the skin if worn under padding.

Most friction blisters telegraph their arrival by a sensation of local heat. This "hot spot" usually develops in the area of imminent blistering 10 to 15 minutes before actual separation of tissue layers begins. Doctor Walter Lobitz, Jr., has found that the blister can often be prevented if *at the time* the hot spot is first noticed you stop, cover the area with water proof (slick surfaced) adhesive tape, then go back to practice.

Rules of the blister game in brief are:

1. *Fit* shoes and other body armor that is rigid.
2. Give skin surfaces time to toughen gradually.
3. Keep athletic socks fluffy.
4. Avoid use of sticky substances on skin.
5. Do not cut tops from blisters.
6. Tape "hot spots" to abort blistering.



Fig. 1 Pitcher's blister: Right big toe sliding forward in a loose shoe

Brief Advice on Moles

Charles Reiter, Jr., M.D.
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Moles, or nevi as they are scientifically termed, occur in varying numbers in all individuals and on all locations of the body.

Probably the most important is the care of any mole that has undergone any change whatsoever such as deepening of its color, increasing in size, itching, bleeding, crusting, etc. Or to reiterate *any change whatsoever* should have immediate medical examination. Also, any mole that spontaneously appears on the skin is worthy of a careful medical check.

Having worked with team physicians and coaches I am aware of the great confidence players place in their coaches and trainers and would confide in them their most personal matters. If one approaches you concerning such a problem, it is imperative that you advise him to see the team or his personal physician immediately so that if any type of care is needed it may be carried out at once. Even the delay of a week or two may greatly affect the outcome and it would not be justified to

withhold medical examination say until the season or tournament is completed.

During the routine care of your players you may notice certain moles that may be advantageous for the athlete to have removed. For example: large moles on the scalp, armpits, or groins may hinder a player somewhat by his natural protection of the birthmark. Also, any moles that you would be suspicious of as those that are extremely black or dark should be brought to the player's attention for possible removal. Any that you would think may have been irritated and in such a location on the body that the player is unable to notice any change it would be imperative also that you bring it to his attention. I would also suggest that no medications whatsoever be applied to irritated moles, as this may change their appearance and delay definitive diagnosis, but rather be submitted to immediate medical check.

In closing I would like to give my sincere thanks to all the coaches of our country who do such a great job for our young men.

The Effects of Ankle Taping on Vertical Jumping Ability

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Since the ankle is under such stress in athletics, it is of major concern to coaches and trainers as one of the more frequently injured body parts (1). In answer to this concern, it has become an almost universal practice to support the point with adhesive tape prior to athletic competition (4). Nellen (5) states that the application of non-elastic tape will support the ankle and reduce lateral movement.

The purpose of this study was to determine the effects of ankle taping in a test of vertical jumping ability of male Physical Education majors.

REVIEW OF THE LITERATURE

Very little research has been done to determine effects of preventive strapping on athletic performance. Mayhew (4) used the Gibney (2) technique to determine results of various motor performance tests. This method of taping as a preventive measure is somewhat questionable since it is used primarily in newly injured cases, or when the ankles are chronically weak (3). The Gibney does give exceptionally good support, but limits plantarflexion to some extent (3). Mayhew (4) found no significant difference in taped and not taped conditions on tests of running (50-yard dash and Illinois Agility Run), but did find a statistically significant difference in activities involving forceful plantarflexion (standing broad jump and vertical jump). Mean taped 22.72 - S.D. 2.47 vs. Mean not taped 23.37 - S.D. 2.44 with a *t* ratio of 4.05.

Thomas and Cotten (6) used a right boomerang run to determine the effects of "preventive" ankle taping on speed and agility. In their work there was no significant difference between taped and not taped conditions (*F* ratio 2.67 df 2.26).

Recently a new product has come on the market in the form of an elastic (tear type) tape. This product, according to the manufacturer, will give good support, yet be elastic enough to allow maxi-

mal plantarflexion and dorsiflexion. To examine this new product, it was used as well as linen backed tape in the study.

METHODOLOGY

Thirty male Physical Education majors were randomly chosen as subjects for the study. All subjects had experience in athletics either at the high school level or at the college level. This group was divided into three sub-groups of ten subjects each.

Each subject was tested using five running vertical jumps under each of three conditions: no tape, linen tape, and elastic tear tape. To minimize fatigue and learning factors the groups were alternated under each condition, and the highest and lowest recorded jump under each condition was eliminated. Though no practice jumps were allowed, each subject was permitted a three-minute warm up period before his first jump under each condition. Heights were measured from the individual's highest flat-footed reach on the wall board.

I. Taping Techniques

A. Linen Tape (Fig. 1)—Ankles were shaved to mid-calf, cleaned, and liberally sprayed with adherent.

1. Two anchor strips were placed around the leg approximately 6 in. above the lateral malleolus.
2. Three or four stirrup strips (depending upon the size of the foot) were placed beginning just posterior to the medial malleolus and overlapping to approximately $\frac{1}{8}$ in. posterior to the fifth metatarsophalangeal joint.
3. Closing strips were then placed from just distal to the original anchor strips to just above the angle of foot and leg.

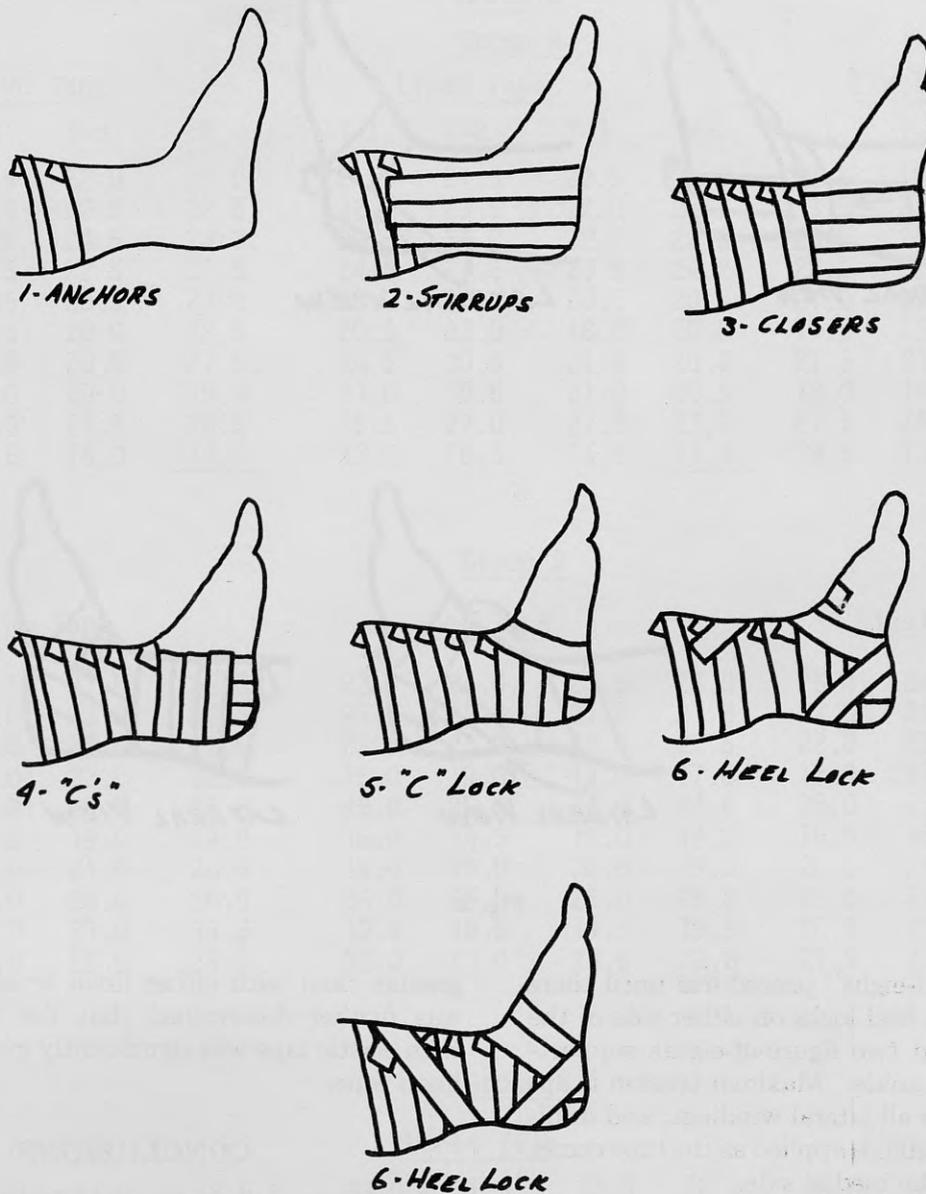


Fig. 1

4. "C" strips covering the stirrups were placed (each overlapping the former by $\frac{3}{4}$ in.) to a point well below the lateral malleolus.
5. A lock strip was then placed to close in the leading edges of the "c" strips with minimum tension over the foot-ankle area.
6. To complete the procedure, medial and lateral heel locks were placed in such a position as not to cover the foot-leg angle and to minimize movement between the calcaneus and talus.

In using this procedure, it will be noted that only one strip of tape (No. 5) is placed over the foot-leg angle. This permits near maximal movement in plantarflexion and dorsiflexion.

B. Elastic Tape (Fig. 2)—The ankle was shaved, cleaned, and liberally sprayed with adherent, as above.

1. The wrap is started approximately 4-6 in. above the medial malleolus and carried downward posterior to the malleolus and under the foot.
2. Continuing upward on the lateral side, the lateral malleolus is covered and maximal tension applied to the wrap as it goes upward and across the tibial compartment.
3. The wrap continues around the leg with minimal tension and downward under the heel to form the first of two heel locks.
4. The wrap continues in these "double

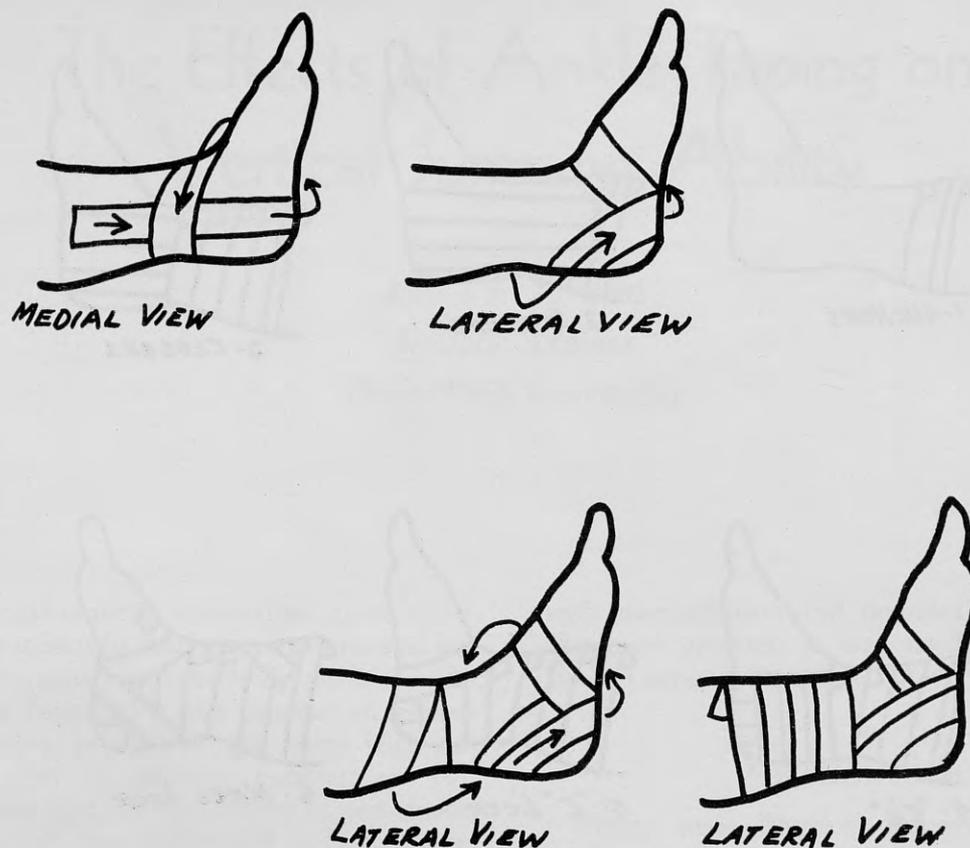


Fig. 2

figure-of-eight" procedures until there are two heel locks on either side of the foot and two figure-of-eights supporting the ankle. Maximal tension is applied on all lateral windings, and minimal tension is applied as the tape comes up on the medial side.

5. On completion of the final heel lock, the wrap encircles the leg upward to close in the exposed portion of the lower leg.

According to the manufacturer, this method of wrapping will "lift the athlete on his toes" which "should" enhance jumping ability.

A block designed analysis of variance was used to determine the difference between means of the heights jumped under the three conditions.

Means

	No tape 22.287	Linen Tape 21.543	Elastic Tape 21.860		
		Sum of	Mean		
	df	Squares	Square	F	
1. Tape Condition	2	8.3487	4.1743	4.6917	
2. Blocks	29	667.6952	23.0240	25.8773	
3. Error	58	51.6046	0.8897	0.0000	
Total	89	727.6485			

Tukey's HSD shows that (at the 0.05 level) the mean height jumped with no tape was significantly

greater than with either linen or elastic tape. It was further determined that the height jumped with elastic tape was significantly greater than with linen tape.

CONCLUSIONS

Strapping of the ankles significantly impairs vertical jumping ability. However, when such strapping is desired as a deterrent to injury, the use of elastic tape allows the athlete to jump at significantly greater heights than when taped with linen tape. It is felt that elastic tape permits greater freedom in plantarflexion thus allowing the athlete to get more "lift" from the ankle joint.

No injuries occurred under any of the conditions. We must return to the old question of which is more important, injury prevention or increased performance. To tape or not to tape is still the question. More work needs to be done to further determine the effects of taping on performance.

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RESULTS

Group A

	<u>No Tape</u>				<u>Linen Tape</u>				<u>Elastic Tape</u>			
	T-1	T-2	T-3	M	T-1	T-2	T-3	M	T-1	T-2	T-3	M
1.	20.5	20.5	22.0	21.0	21.5	21.5	20.5	21.2	21.5	19.5	20.5	20.5
2.	22.5	21.5	22.5	22.6	22.5	23.5	22.0	22.7	23.5	23.5	23.0	23.3
3.	22.0	23.5	24.5	23.3	20.5	21.0	22.5	22.5	23.5	24.0	23.0	23.5
4.	22.5	22.5	22.5	22.5	24.5	24.5	23.5	24.2	23.5	22.0	23.0	22.8
5.	22.0	21.5	20.5	21.3	19.0	21.5	20.5	20.3	21.0	21.0	20.5	20.8
6.	20.0	21.5	20.0	20.5	20.5	22.0	18.5	20.5	19.5	18.5	19.5	19.2
7.	21.5	22.0	20.5	21.5	20.5	20.5	21.5	20.8	21.5	21.5	21.5	21.5
8.	20.0	18.0	20.0	19.3	21.0	19.5	21.0	20.5	18.0	18.0	17.0	17.6
9.	25.5	27.5	27.5	26.5	26.5	27.0	27.5	27.0	27.5	26.5	28.0	27.3
10.	14.5	15.5	15.0	<u>14.8</u>	13.5	16.5	14.5	<u>14.8</u>	14.5	13.5	14.5	<u>14.2</u>

Group B

	<u>No Tape</u>				<u>Linen Tape</u>				<u>Elastic Tape</u>			
	T-1	T-2	T-3	M	T-1	T-2	T-3	M	T-1	T-2	T-3	M
1.	26.5	26.5	27.5	26.8	23.5	24.0	23.5	23.8	25.0	24.5	24.5	24.8
2.	22.0	22.0	23.0	22.3	21.5	22.0	21.5	21.6	22.0	22.0	22.5	22.2
3.	22.0	23.0	23.0	22.6	22.5	23.0	22.5	22.6	22.0	23.0	23.0	22.8
4.	22.0	21.0	23.0	22.0	15.0	19.0	17.0	17.0	17.0	17.0	17.0	17.0
5.	25.0	25.0	25.5	25.2	25.0	25.0	24.0	24.6	25.0	25.0	25.5	25.2
6.	19.0	19.0	19.0	19.0	15.0	14.5	15.0	14.8	16.0	16.0	15.0	15.8
7.	20.0	21.0	21.0	20.6	19.0	19.0	20.0	19.3	20.0	21.0	21.0	20.8
8.	26.0	26.0	26.0	26.0	26.0	25.5	26.0	25.8	25.0	24.5	25.0	24.8
9.	17.0	21.0	21.0	19.6	19.5	19.5	19.5	19.5	20.5	20.5	21.5	20.8
10.	25.0	25.0	25.0	<u>25.0</u>	22.0	23.0	23.5	<u>22.8</u>	25.5	25.5	26.0	<u>25.7</u>

Group C

	<u>No Tape</u>				<u>Linen Tape</u>				<u>Elastic Tape</u>			
	T-1	T-2	T-3	M	T-1	T-2	T-3	M	T-1	T-2	T-3	M
1.	32.0	21.0	33.0	32.6	33.0	31.5	32.0	32.3	33.0	33.0	32.0	32.8
2.	23.5	23.5	22.5	23.2	23.5	23.5	24.0	23.7	23.5	23.5	24.0	23.8
3.	24.0	23.5	23.5	23.6	23.5	22.5	23.5	23.2	22.5	22.5	23.0	22.3
4.	23.5	24.5	25.0	24.3	25.5	25.0	25.0	25.2	25.5	23.5	23.5	24.2
5.	23.0	23.0	24.0	23.3	23.0	22.0	22.0	22.3	23.0	22.0	23.0	22.8
6.	24.0	24.0	24.0	24.0	21.5	22.0	22.0	21.8	23.5	23.0	23.0	23.2
7.	20.0	19.5	20.5	20.0	20.0	19.5	20.5	20.0	19.5	19.5	20.5	19.8
8.	25.0	26.0	26.5	25.8	26.5	26.0	26.0	26.2	26.5	26.0	26.0	26.2
9.	21.0	21.0	21.0	21.0	20.0	21.0	19.5	20.2	20.0	20.0	20.5	20.2
10.	18.5	18.0	18.0	<u>18.2</u>	20.0	20.0	20.0	<u>20.0</u>	20.0	20.0	20.0	<u>20.0</u>

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Effects of Ankle Taping Upon Strength Decrement and Surface Temperature of Knee Flexors and Extensors in Submaximal Treadmill Running¹

D. Ray Collins, Ed.D.² and John Wells, H.S.D.³

A prolonged controversy has existed concerning the value of supporting the ankles during athletic competition. According to Rarick and associates (11), most athletic trainers and team physicians with long experience in treating sports injuries, recommend the taping of normal ankles prior to engagement in contact sports. Conversely, some coaches, trainers, and team doctors theorize that taping the ankles places undue strain on the knees and therefore increases the incidence of knee injuries. There is general agreement that preventive ankle taping lends support to the ankle during stress situations, but since preventive ankle taping is designed to restrict the inversion-eversion movement of the ankle joint, some authorities believe the taping procedure reduces the knee's ability to dissipate the force of a lateral blow. For this reason, in addition to the suspicion that ankle taping produces a constriction of blood flow in the lower extremities, adversaries of preventive ankle taping contend that the knees are more susceptible to injury when the ankles are taped.

Several authors assert that fatigue may be a predisposition to injury (1, 4, 5, 6, 9, 10). Although the term, fatigue, is difficult to adequately define because of its varied usage, researchers have attempted to measure this phenomenon in a variety of ways. In the physical education profession, the use of strength decrement as an index for fatigue

has become commonplace. Since strength loss is a manifestation of fatigue and knee strength depends upon the strength of the quadriceps and hamstrings, this study was conducted to investigate the effects of ankle taping upon the strength decrement of those muscle groups when subjected to submaximal treadmill running.

The study was also designed to determine the effects of ankle taping upon the surface temperature change in five selected thigh and knee joint locations when exposed to strenuous treadmill running. Every object in nature emits radiant energy as a function of its absolute temperature while simultaneously absorbing some of the energy emitted in its direction by other objects. Consequently, the human body continuously absorbs and emits radiant energy. It is the self-emitted radiant energy within the infrared region that is utilized in the measurement of skin temperature. The measurement of skin temperature as a means for diagnosing certain diseases and medical conditions has been utilized in certain branches of medicine. There is general agreement that impaired body tissue appears "hotter" or "cooler" than normal tissue depending upon the type of impairment. This provided a basis for studying the effects of submaximal treadmill running upon the skin temperature change of selected thigh and knee joint areas and furthermore, to study the effect of ankle taping upon the temperature change.

REVIEW OF LITERATURE

A review of the literature failed to reveal a research study which investigated the effects of ankle taping upon fatigue of the knee joint during submaximal exertion. However, two studies were reviewed in which survey techniques were imple-

¹This study was abstracted from a dissertation submitted by D. Ray Collins in partial fulfillment of the requirements for the Ed.D. degree at Louisiana State University, under the supervision of Jack K. Nelson, in 1972.

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mented to study the incidence of knee injuries in relation to ankle taping.

Wells (14) surveyed 20 colleges and universities from three major conferences to study the incidence of knee injuries in relation to ankle taping. The number of knee injuries sustained, whether or not the ankles were taped, and the requirements for ankle taping were obtained. The findings of the study failed to indicate a marked increase in knee injuries due to ankle taping. Stretch (12), in a survey study involving 516 high schools in Michigan, used chi-square analysis in finding no relationship between the incidence of knee injuries and the use of adhesive and cloth ankle wrappings.

PROCEDURES

Sixty college and high school senior males from Louisiana State University and University Laboratory School, Baton Rouge, served as subjects. The subjects followed a counterbalanced testing schedule in completing a ten-minute treadmill run at a ten per cent grade under each of two conditions: ankles taped, and ankles untaped. The two testing sessions for each subject were spaced one week apart. The session when the subject's ankles were taped was the same as the untaped ankle session except for a brief period of time that was required to tape the ankles. The taping was administered by student trainers from Louisiana State University and the strapping was used as a modified Gibney technique with heel lock.

When the subject reported for testing, the five anatomical locations of the lower extremities which were to be assessed for surface temperature were marked with gentian violet. This was necessary to insure consistency in locating the skin temperature areas the following week under the second experimental condition. The five body sites included: the belly of the rectus femoris, quadriceps tendon, lateral collateral ligament, medial collateral ligament, and the belly of the biceps femoris. For each testing session, the subject was clad only in gym shorts, socks, and tennis shoes, and the ambient room temperature was held between 68 and 78° F.

Immediately after the body surface areas were marked, the subject sat for fifteen minutes with the knees flexed at 110 degrees to allow the skin temperature to stabilize with the ambient room temperature. The subject was instructed to remain as still as possible during the skin temperature stabilization period to reduce the negative effect of artifacts. To further insure against the influence of artifacts, the subjects were asked to refrain from eating, drinking, or smoking for at least three hours prior to the testing sessions.

Following the skin stabilization period and preceding a one-minute treadmill warmup and strength

measurement procedure, pre-exercise skin temperature recordings of the five anatomical areas were acquired with a Barnes MT-3 Infrared Thermometer. The infrared thermometer (radiometer) is a heat detection device which measures instantly in either Centigrade or Fahrenheit degrees on a meter to accuracies of less than one-tenth Centigrade (2). A hand-held radiometer was employed in this study.

After the one-minute treadmill warmup period, the subject was tested for pre-exercise isometric of the knee extensors and flexors with knee joint angles of 125 and 160 degrees, respectively. A standardized one-minute preparation period for strength measurements was required between the warmup and those measurements. The static strength was assessed with the Drury-Broussard Torque Table, an instrument designed to measure the force exerted by the muscles of the arms and legs (7). The torque table contained arm and leg levers which were adjustable in length and angle of pull and was equipped with a torqueometer which contained a foot-pound gauge to indicate the numerical value of strength. The torqueometer was registered to only 350 foot-pounds; therefore, the right and left extensor strength was tested separately. The strength of each muscle group was assessed by requiring the subject to complete two maximum pulls on the cross bar of the leg lever.

The strength testing of the knee flexors and extensors was systematically rotated throughout the study; however, in testing the knee extensors, the right extensor was always tested first in both the pre- and post-exercise measurements. Only the best strength value of each muscle group was recorded in order to assure greater probability in obtaining the maximum knee flexor and extensor strength of the individual.

As aforementioned, the subjects completed a ten-minute treadmill run at an incline of ten per cent. One minute after the run the strength testing procedures were implemented in the same manner as the pre-exercise measurements except that only one maximum exertion for both knee flexion and extension was required. If more than one pull had been required, the authors felt that the strength decrement could have been partially due to the repeated contractions instead of the treadmill running conditions.

The post-exercise skin temperature measurements were repeated at two-minute intervals until a peak temperature was observed in each body surface location of each thigh and knee joint. The body site temperatures were monitored for at least fifteen minutes after the treadmill run because the post-exercise time period of that length was necessary in order to alleviate the influence of heat loss by evaporation. Fifteen minutes proved to be ample time to allow the skin to dry, thereby causing heat

Table 1 Analysis of Mean Strength Decrement Values of Knee Flexors and Extensors and Mean Gains of Surface Temperature in Selected Body Locations

Belly of Rectus Femoris=BRF
 Quadriceps Tendon=QT
 Lateral Collateral Ligament=LCL
 Medial Collateral Ligament=MCL
 Belly of Biceps Femoris=BBF

Knee Flexors-KF
 Right Knee Extensors=RKE
 Left Knee Extensors=LKE
 Untaped Ankles=UA
 Taped Ankles=TA

Running Condition and Muscle Group	N	Initial Score Mean (Foot-pounds)	Final Score Mean (Foot-pounds)	Difference	SE Diff.	t	P
KF-UA	60	161.50	149.92	11.58	1.93	6.00	.01
KF-TA	60	168.50	148.33	20.17	2.87	7.03	.01
RKE-UA	60	199.50	183.83	15.67	2.65	5.91	.01
RKE-TA	60	203.92	187.09	16.83	2.82	5.97	.01
LKE-UA	60	197.58	189.75	7.83	3.16	2.48	.05
LKE-TA	60	206.58	196.41	10.17	3.69	2.76	.01

t needed for significance at .01 level of probability = 2.66
 t needed for significance at .05 level of probability = 2.00

Running Condition and surface area	N	Initial Score Mean (Degrees Centi-grade)	Final Score Mean (Degrees Centi-grade)	Difference	SE Diff.	t	P
BRF-UA	120	31.23	32.64	1.41	.049	28.67	.01
BRF-TA	120	31.49	32.70	1.21	.049	24.65	.01
QT-UA	120	30.86	32.35	1.49	.063	23.53	.01
QT-TA	120	31.07	32.53	1.46	.061	23.89	.01
LCL-UA	120	30.96	31.96	1.00	.052	19.17	.01
LCL-TA	120	31.08	32.05	0.97	.057	17.14	.01
MCL-UA	120	30.75	31.91	1.16	.052	22.27	.01
MCL-TA	120	30.88	32.04	1.16	.051	22.80	.01
BBF-UA	120	30.75	32.16	1.41	.051	27.57	.01
BBF-TA	120	30.77	32.17	1.40	.056	25.15	.01

t needed for significance at .01 level of probability = 2.62
 t needed for significance at .05 level of probability = 1.98

loss after that time to be chiefly due to radiation.

RESULTS

The initial analysis of data in this study was concerned with the mean strength decrement values of the knee flexors and extensors of sixty subjects following the two conditions of treadmill running. Mean gains in surface temperature of the aforementioned body sites were also analyzed. A *t*-test for significance of the difference between correlated means was used to compute the significance of the mean strength decrement values and surface temperature gains.

Under each treadmill running condition, the strength decrement values for the knee flexors, right knee extensors, and left knee extensors were significant at the 0.01 level of probability. The same was true for skin temperature elevation in each of the thigh and knee joint sites. The means for the pre- and post-exercise strength and skin

temperature measurements are shown in Table 1.

A randomized block analysis of covariance procedure was employed to compare the two treadmill running conditions concerning strength decrement of the knee flexors. Analysis of covariance was necessary because a significant relationship was found between the pre-exercise strength scores of the knee flexors and the strength decrement of that muscle group. As shown in Table 2, the *F*-ratio of 2.82 did not meet the required test of significance at the 0.05 level of probability. The adjusted mean strength decrement was 13.21 foot-pounds for running with untaped ankles and 18.54 foot-pounds for running with taped ankles.

A randomized block two-by-two factorial analysis of covariance procedure was used to determine the difference between the two experimental conditions in producing strength decrement in the right and left knee extensors, the strength loss differences of the right and left legs, and the inter-

Table 2 Analysis of Covariance for Strength Decrement Values of the Knee Flexors and Extensors of Sixty Subjects Resulting From Treadmill Running Under Two Experimental Conditions

Source of Variation	Adjusted Sum of Squares	Degrees of Freedom	Mean Square	F	P
Subject	27,390.13	59			
Treatment	727.74	1	727.74	2.82	NS
Error	14,951.32	58	257.78		
Total	43,069.19	118			

F needed for significance at .01 level of probability = 7.10
 F needed for significance at .05 level of probability = 4.01

Source of Variation	Adjusted Sum of Squares	Degrees of Freedom	Mean Square	F	P
Subject	78,612.26	59			
A (Treatment)	32.41	1	32.41	0.09	NS
B (Treatment)	3,276.06	1	3,276.06	9.06	.01
A X B (Treatment X Leg)	4.36	1	4.36	0.01	NS
Error	63,624.24	176	361.50		
Total	145,549.33	238			

F needed for significance at .01 level of probability = 6.78
 F needed for significance at .05 level of probability = 3.89

action of these variables. Again, analysis of covariance was required because a significant relationship existed between the pre-exercise strength values of the knee extensors and that muscle group's strength loss. Table 2 denotes the above-mentioned comparisons, revealing an F-ratio of 0.09 in comparing the conditions of treadmill running with regard to knee extensor strength loss. The 13.00 and 12.25 mean foot-pound decrements reflected the lack of significance.

An F-ratio of 9.06 was obtained in the comparison of right and left knee extensor strength. The adjusted mean negative gains were 16.32 foot-pounds for the right extensors and 8.93 foot-pounds for the left extensors. Thus, there was greater action of the above variables, an F-ratio of 0.01 was found, indicating the difference in decrement between the right and left extensors to be uniform under both experimental conditions.

A randomized block two-by-two factorial analysis of covariance procedure was also used to analyze the skin temperature increases of the five body surface locations. The right and left leg were also

compared for temperature increase, along with the interaction of the variables.

As indicated in Table 3, an F-ratio of 10.70 resulted from the comparison of the average skin temperature increase at the belly of the right and left rectus femoris muscles of the 60 subjects. This indicated that the skin temperature increases of the subjects' rectus femoris muscles were significantly greater during the sessions when the ankles were not taped as opposed to the increases when running with taped ankles. The adjusted mean gains for the running conditions were 1.39°C. for the rectus femoris of the subjects treadmill running with the ankles untaped and 1.22°C for the same muscle of the subjects when running with the ankles taped. An F-ratio of 1.14 was obtained when comparing the difference of the right and left leg with respect to surface temperature increase in the belly of the rectus femoris. Therefore, no significant difference in skin temperature increase of the rectus femoris existed between the right and left legs. Adjusted mean gains were 1.33°C. for the rectus femoris of the right leg and 1.28°C. for this muscle

Table 3 Analysis of Covariance for Surface Temperature Increases of Five Body Sites of Sixty Subjects Resulting from Treadmill Running Under Two Experimental Conditions

Rectus Femoris Muscles					
Source of Variation	Adjusted Sum of Squares	Degrees of Freedom	Mean Square	F	P
Subject	50.29	59			
A (Treatment)	1.54	1	1.54	10.70	.01
B (Leg)	0.16	1	0.16	1.14	NS
A X B (Treatment X Leg)	0.10	1	0.10	0.72	NS
Error	25.40	176	0.144		
Total	77.49	238			
Quadricep Tendons					
Subject	63.25	59			
A (Treatment)	0.00	1	0.00	0.00	NS
B (Leg)	0.00	1	0.00	0.00	NS
A X B (Treatment X Leg)	0.003	1	0.003	0.01	NS
Error	36.50	176	0.21		
Total	99.753	238			
Lateral Collateral Ligaments					
Subject	48.92	59			
A (Treatment)	0.00	1	0.00	0.00	NS
B (Leg)	0.53	1	0.53	2.65	NS
A X B (Treatment X Leg)	0.05	1	0.05	0.25	NS
Error	35.67	176	0.20		
Total	85.17	238			
Medial Collateral Ligaments					
Subject	47.93	59			
A (Treatment)	0.06	1	0.06	0.33	NS
B (Leg)	0.21	1	0.21	1.17	NS
A X B (Treatment X Leg)	0.007	1	0.007	0.04	NS
Error	32.33	176	0.18		
Total	80.537	238			
Biceps Femoris Muscles					
Subject	62.69	59			
A (Treatment)	0.00	1	0.00	0.00	NS
B (Leg)	0.00	1	0.00	0.00	NS
A X B (Treatment X Leg)	0.005	1	0.005	0.03	NS
Error	28.86	176	0.16		
Total	91.555	238			

F needed for significance at .01 level of probability = 6.78

F needed for significance at .05 level of probability = 3.89

in the left leg. The interaction of the above variable was not significant as reflected by an F-ratio of 0.72. Thus, the differences between the taped and untaped ankle conditions were constant for the right and left legs.

The difference in temperature increases following treadmill running with and without ankle taping was not significant in the quadricep tendons, lateral collateral ligaments, medial collateral ligaments, and biceps femoris muscles. Nor was there a significant difference between the right and left legs for any of the body sites. These comparisons are included in Table 3.

DISCUSSION

The authors felt that the information obtained in this study was too insubstantial to lend any sig-

nificant credence to the school of thought which charges that preventive ankle taping hastens the onset of fatigue in the knee flexors and extensors and possible predisposes the knees to injury.

The finding which revealed a significantly greater surface temperature increase in the rectus femoris muscles when the subjects' ankles were untaped provided a basis for some interesting speculation concerning a possible reason for the difference in temperature elevation. Since convection by means of blood flow is a principal type of body heat emission, and a principal function of the arterioles is to distribute the amount of blood flow according to the needs of the tissues, there is a possibility that ankle taping contributed to a greater need for blood in the rectus femoris muscles, thereby diminishing the blood supply to the skin and causing the reduction in surface temperature.

The significant difference found between the right and left knee extensors regarding strength decrement was expected. The right knee extensors were always assessed for static strength before the left extensors in the pre- and post-tests for both experimental conditions; therefore, the significantly greater strength decrement for the right knee extensors was attributed to the greater strength recovery time allotted to the left knee extensors.

CONCLUSIONS

Within the limitations of this study, the following conclusions were formed:

1. Ankle taping apparently does not contribute to strength decrement in the knee flexors and extensors during a stressful running performance.
2. There is some evidence that ankle taping retards the normal surface temperature elevation of the knee extensors during strenuous anterior-posterior movement of those muscles.
3. Ankle taping does not appear to affect the normal skin temperature elevation of the quadriceps tendons, lateral collateral ligaments, medial collateral ligaments, and biceps femoris muscles during submaximal running.

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National Athletic Trainers' Association

Twenty-Third Annual Meeting—June, 1972

St. Louis, Missouri

THE REPORT OF THE EXECUTIVE DIRECTOR

The first meeting of the Board of Directors of the National Athletic Trainers' Association was called to order at 7:10 P.M., June 9, 1972 in the Spirit of St. Louis Room, Stouffer's Riverfront Inn, St. Louis, Missouri by President Bobby Gunn. Those in attendance were:

District 1—Frank George
District 2—Francis J. Sheridan
District 3—Joseph Gieck
District 4—Roland E. LaRue
District 5—Byron J. Bird
District 6—Tom Wilson
District 7—Rodney Kimball
District 8—Lewis C. Crowl
District 9—Warren Morris
President—Bobby Gunn
Executive Director—Otho Davis
Parliamentarian—Bruce Melin

Absent: District 10—Mert Prophet

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

II. Mr. Herbert "Duke" Hedges, American General Life Insurance Company, met with the Board of Directors to discuss the new N.A.T.A. life insurance plan.

III. The Treasurer's Report was read and discussed.

A motion was made by Mr. Sheridan and seconded by Mr. Morris to accept the Treasurer's Report.

ACTION: Approved

IV. The N.A.T.A. definition of "actively engaged" was discussed at length.

A motion was made by Mr. George and seconded by Mr. Gieck to change the N.A.T.A. definition of "actively engaged" to read as follows:

A person who is on a salary basis (no fee) employed by an educational institution, professional athletic organization or other bona fide athletic organization for the duration of the institution's

school year, or the length of the athletic organization season and who performs the duties of athletic trainer as a major responsibility of his employment, or whose responsibility is the teaching in the N.A.T.A. approved athletic training curriculum.

ACTION: Approved

V. The functions of the Executive Council and Division Directors were discussed.

A motion was made by Mr. Sheridan and seconded by Mr. Wilson to eliminate the office of Division Directors.

ACTION: Approved

VI. Committees and Committee Chairmen, being directly responsible to the Board of Directors was discussed.

1. A motion was made by Mr. George and seconded by Mr. Morris that an Ethics Committee be formed.

ACTION: Approved

2. A motion was made by Mr. Kimball and seconded by Mr. Morris that a Drug Education Committee be formed.

ACTION: Approved

VII. President Gunn presented the following committee chairmen appointments for a two-year term:

Audio Visual Aids—Dick Hoover
Certification—Lindsay McLean
Drug Education—Al Hart
Ethics—L. F. "Tow" Diehm
Grants & Scholarships—W. E. "Pinky" Newell
Honor Awards—George Sullivan
Journal—Clyde Stretch
Membership—Bruce Melin
National Convention—Fred Hoover
Placement—A. G. Edwards
Professional Education—Sayers "Bud" Miller
Sub-Committee for Graduate and Continuing Education—Gary Delforge
Public Relations—Dick Malacrea

Recruitment—Mel Blickenstaff
Research & Injury—Gordon Graham

A motion was made by Mr. Morris and seconded by Mr. Wilson to accept the appointments of the Committee Chairmen.

ACTION: Approved

VIII. The Scientific Exhibit, which was donated to the association by Johnson & Johnson, was discussed. Due to the great expense this exhibit has cost the N.A.T.A., it was decided to discontinue use of this media and offer it back to Johnson & Johnson for their use.

IX. The William E. Newell scholarship was discussed and it was reported by President Gunn that Mr. Jack Cramer has assured him that \$250.00 will be made available each year for this award.

X. Liability insurance sources are still being sought by the National Office for the membership. It is hoped that more information will be available in January on this subject.

XI. Mr. LaRue presented the Ad Hoc Committee Report on History and Archives. Mike O'Shea is doing his Master of Arts' thesis on the History of the National Athletic Trainers' Association. This will be valuable information for the Association. Any one with information or pictures should correspond with Mr. O'Shea at the U.S. Air Force Academy, c/o Athletic Department, U.S.A.F. Academy, Colorado 80840.

XII. The selection of Olympic and Pan American Game Trainers, tabled from the January 1972 Board of Directors meeting, was discussed.

A motion was made by Mr. George and seconded by Mr. Sheridan that the selection of Olympic and Pan American Game Trainers be as follows:

1. All members of the N.A.T.A. must submit their names for selection as athletic trainer for the Olympic and Pan American competition through their respective districts of the N.A.T.A. for presentation to the N.A.T.A. Olympic Selection Committee.

2. Failure to go through the N.A.T.A. Selection Committee will result in review by the Code of Ethics Committee.

3. No N.A.T.A. member will directly submit his name to the United States Committee nor encourage his name to be submitted.

4. Each district will submit to the N.A.T.A. Olympic Selection Committee one (1) name for each eighteen (18) certified members and it breaks down as follows:

District 1—Five (5) names for ninety-five (95) certified members.

District 2—Eleven (11) names for one hun-

dred ninety (190) certified members.

District 3—Three (3) names for fifty-seven (57) certified members.

District 4—Eight (8) names for one hundred thirty-seven (137) certified members.

District 5—Three (3) names for forty-two (42) certified members.

District 6—Five (5) names for eighty-five (85) certified members.

District 7—Two (2) names for thirty-six (36) certified members.

District 8—Five (5) names for ninety-three (93) certified members.

District 9—Three (3) names for fifty-six (56) certified members.

This formula will change with the increase of certified members.

5. The members submitted must be certified and actively engaged in athletic training.

ACTION: Approved

XIII. Dr. Kenneth Clarke was a guest of the Board of Directors to enlighten and answer questions in reference to the N.A.T.A. and other allied health organizations.

XIV. The position of a National Exhibits Chairman was discussed.

A motion was made by Mr. Wilson and seconded by Mr. Sheridan that the position of National Exhibits Chairman be deleted from the committee structure. The exhibits will be handled by the Executive Director, National Convention Chairman and a commercial exhibits firm who will be responsible to the Executive Director.

ACTION: Approved

XV. The over-recruitment of student trainers by colleges in regards to the jobs available in certain areas after graduation was discussed.

ACTION: Tabled until a later date.

The Board recessed at 11:20 P.M. with instructions to reconvene at 9:00 A.M., Saturday, June 10.

Saturday, June 10, 1972, the Board reconvened at 9:00 A.M. Those in attendance were the same as on June 9.

XVI. President Gunn read a resolution to the board at the request of Dr. Don Cooper from the Joint Commission on Competitive Safeguards and Medical Aspects of Sports. The Resolution is as follows:

BE IT RESOLVED, that the Joint Commission on Competitive Safeguards and Medical Aspects of Sports recommends that the hard outer surface on

football equipment, such as helmets and shoulder pads, be covered with a soft impact reducing substance to help lower the number of injuries occurring from blows received by players being hit by these hard surfaces.

It is further recommended that those organizations which may be setting standards in the area of athletic equipment be made aware of this Resolution.

XVII. Mr. Bud Zimmerman was guest of the Board of Directors to discuss the accreditation of the N.A.T.A. as an Allied Health Profession with the American Medical Association.

XVIII. A motion was made by Mr. Sheridan and seconded by Mr. Crowl for President Gunn to appoint an Ad Hoc Committee to study the possibility of accreditation as an Allied Health Profession.

ACTION: Approved 8-1

XIX. The endorsement of student athletic trainer workshops and athletic training seminars was discussed.

A motion was made by Mr. George and seconded by Mr. Morris that the endorsement of Student Athletic Trainer Workshops and Athletic Training Seminars be the responsibility of the Professional Education Committee.

ACTION: Approved

XX. Mr. LaRue presented a preliminary report on recommendations for Training Room Facilities.

XXI. Mr. LaRue presented a preliminary report on recommendations for Training Room Staff.

XXII. Realignment of Districts was discussed. Mr. Crowl was instructed to review this and present more data at the Tuesday Board Meeting.

XXIII. Memorial Resolutions were discussed. Memorial Resolutions will be presented at the National business meeting, but not read. There is to be a moment of silent prayer by the membership in attendance. The Memorial Resolutions will be included in the official minutes and published in the Journal.

XXIV. Mr. George Sullivan, Chairman of the Honor Awards Committee, submitted the following persons for:

1. Twenty-five Year Awards:

- A. District 1
Walter Grockowski—Wesleyan University
- B. District 2
Alden Coder—Montclair State

William Morrow—Phillipsburg, N.J.
Richard Morsch—Haverford College
Thomas Sullivan—Princeton University

- C. District 3
Ed Block—Baltimore Colts Football
Leroy Brandimore—Johns Hopkins University
Leon "Red" Romo—U. S. Naval Academy
Joe Kuczo—Washington Redskins Football
- D. District 4
Joe Begala—Kent State University
Len Paddock—University of Michigan
Gayle Robinson—Michigan State University
- E. District 5
Byron Bird—Oklahoma State University
Wayne Rudy—Kansas City Chiefs Football
- F. District 6
Ross Moore—University of Texas at El Paso
Wayne Rideout—Austin High School, Bryan, Texas
- G. District 7
Richard Carr—Sahwara High School, Tucson, Arizona
- H. District 8
Lincoln Kimura—San Francisco 49ers Football
Jeo Romo—Oakland Athletics Baseball
Ray West—St. Mary's University
- I. District 9
Marty Broussard—Louisiana State University
Earl "Bubba" Porche—Tulane University

2. Honorary Membership Awards:
- David Arnold—National Federation of State High Schools
 - Richard Schafer—National Federation of State High Schools
 - Dr. Joseph Pollard—Dartmouth University
 - Dr. Thomas Quigley—Harvard University
 - Dr. Fred Reynolds—St. Louis Football Cardinals

A motion was made by Mr. Sheridan and seconded by Mr. LaRue that the nominees be approved.

ACTION: Approved.

XXV. The Executive Director made the following report pertaining to Areas of Representation.

A. The Association was represented at the following meetings and conferences during 1971-1972:

1. American Association for Health, Physical Education and Recreation—Sayers "Bud" Miller
2. American College Health Association—James Dodson
3. American Corrective Therapy Association—Frank Randall
4. American Medical Association Committee on Medical Aspects of Sports—Tom Healion
5. American Physical Therapy Association—Frank George
6. Joint Commission on Competitive Safeguards and Medical Aspects of Sports—William Newell, Bobby Gunn, Fred Hoover, Otho Davis
7. N.C.A.A. Rules Committee—Chris Patrick
8. National Federation of State High School Athletic Association—Fred Hoover
9. National Operating Committee for Standards in Athletic Equipment—George Sullivan
10. U. S. Olympics Committee—Chuck Medlar

All representatives presented reports of their meetings which are on file in the Association office.

B. The following persons were appointed by President Gunn to represent the Association at the meetings designated for the years 1972-73:

1. American Academy of Pediatrics—Richard Malacrea
2. American Association for Health, Physical Education and Recreation—Sayers "Bud" Miller.
3. American College Health Association—James Dodson
4. American College of Sports Medicine—Gary Delforge
5. American Corrective Therapy Association—Frank Randall
6. American Medical Association Committee on Medical Aspects of Sports—Dick Hoover
7. American Physical Therapy Association—Frank George
8. Joint Commission on Competitive Safeguards and Medical Aspects of Sports—

William Newell, Gordon Graham, Bobby Gunn, Otho Davis

9. N.C.A.A. Rules Committee—Chris Patrick
10. National Federation of State High School Athletic Association—Fred Hoover
11. National Operating Committee for Standards in Athletic Equipment—George Sullivan
12. U. S. Olympic Committee—Chuck Medlar

A motion was made by Mr. Sheridan and seconded by Mr. Gieck to accept the appointees.

ACTION: Approved

XXVI. Mr. Fred Hoover, National Convention Chairman, presented a report on the 1973 Atlanta Convention to be held at the Sheraton Biltmore Hotel, June 10 to 13.

Mr. Hoover also gave a brief report on the Kansas City Convention, June 9 to 12, 1974. This will be held at the New Crown Center Hotel.

XXVII. The Professional Education Committee budget request for \$300.00 was discussed.

A motion was made by Mr. George and seconded by Mr. Gieck to accept the request.

ACTION: Approved

XXVIII. The Journal Committee budget request for \$16,350.00 was discussed.

A motion was made by Mr. George and seconded by Mr. Sheridan to accept the request.

ACTION: Approved

XXIX. The Audio-Visual Aids Committee budget request for \$100.00 was discussed.

A motion was made by Mr. George and seconded by Mr. Sheridan to accept the request.

ACTION: Approved

XXX. The Board of Certification Committee budget request for \$50.00 was discussed.

A motion was made by Mr. George and seconded by Mr. Gieck to accept the request.

ACTION: Approved

XXXI. The Research and Injury Committee budget was discussed.

ACTION: Tabled until Tuesday.

XXXII. The Recruitment Committee budget was discussed.

ACTION: Tabled until Tuesday.

XXXIII. The report of the Professional Services was discussed.

A motion was made by Mr. Sheridan and seconded by Mr. George to accept the report.

ACTION: Approved.

XXXIV. The report of the Certification Committee was discussed.

The Certification Committee requested changes in the procedure for certification as follows:

1. Under Section I, it is recommended by the Board of Certification that two letters of recommendation be required by the applicant as is now required under Section IV.

A motion was made by Mr. Sheridan and seconded by Mr. Wilson that the request by the Board of Certification requiring two letters of recommendation under Section I of the Procedure for Certification be denied.

ACTION: Request denied.

2. It is recommended that Section I be eliminated from the Procedures for Certification effective January 1, 1977, (five years from this date), and that this information be provided on all current copies of the Procedures for Certification.

A motion was made by Mr. Sheridan and seconded by Mr. Wilson that the request to eliminate Section I from the Procedure for Certification effective January 1, 1977, be denied.

ACTION: Request denied.

3. Allow the examination to be given on a regional basis once each year at the time and site most suitable to the individual district involved in addition to the annual examination at the site of the National Convention.

A motion was made by Mr. Sheridan and seconded by Mr. Crowl that the request to give the certification exam on a regional basis once each year and at the National Convention be accepted.

ACTION: Approved.

XXXV. The report by the Professional Education Committee was discussed and tabled until Tuesday.

XXXVI. Mr. Gieck presented the Board of Directors for discussion the practice of firing athletic trainers when coaching changes are made at schools.

The Board recessed at 5:00 p.m. with instructions to reconvene at 1:00 p.m. Tuesday, June 13, 1972.

Monday, June 12, 1972, Business Meeting

XXXVII. The twenty-third Annual Business Meeting of the National Athletic Trainers Association held at Stouffer's Riverfront Inn in St. Louis, Missouri. The meeting was called to order by President Bobby Gunn at 11:00 a.m., June 12, 1972.

The roll call was dispensed with.

Report of Officers

The Treasurer's Report was read, discussed and approved.

The minutes of the 1971 meeting were approved without reading.

The Executive Director presented a report to the Membership pertaining to the actions of the Board of Directors as listed previously.

A standing ovation was given to Bruce Melin, Program Chairman; John Omohundro, Entertainment Chairman; and Joe Blankowitsch, Registration Chairman.

President Gunn presented the members of the Board of Directors to the membership.

A Memorial Resolution was presented for: Ernest Biggs, Ohio State University, from District 4.

A DEDICATION TO ERNIE BIGGS

*by Lew Crowl
and Skip Vosler*

The many people who have worked with Ernie Biggs may be able to recall many physical characteristics; but those most apparent were: a man of relatively small stature with a pipe dangling from a mouth formed in an eternal smile, determined but gentle blue eyes accented with crow's feet on each side, and square jaws with a bow tie directly beneath. Ernie lived life to the fullest extent. He may have been small in stature, but he was great in every other way. His dedication to his profession, his fellow man and family will all be remembered and respected forever. Ernie's death came as a shock to all of us because his love of life and trust in God seemed to make him indestructible. His integrity was exemplified in his living standards and his outstanding contributions to his profession. All of us who worked with Ernie Biggs benefited immeasurably by his presence on earth.

Every day we are reminded of Ernie because he so influenced our lives, and his teachings and innovations are reflected in our professional skills. Those of us who were fortunate enough to be his pupil as well as his friend can not begin to describe all the ways in which he affects our daily living. The greatest and fondest memories include the hours of instruction not only in the training room, but outside with the athletes, the association and friendship with him and his family and the one fondest memory of all, the harmonizing of our favorite songs. Words are inadequate to describe the admiration and gratitude so fine a man deserves; but these memories will live forever in our minds and hearts and all of us thank God for the wonderful privilege of having known Mr. Ernie Biggs.

Dick Hoover introduced Mr. George Howland to the N.A.T.A. membership. Mr. Howland spoke about the movie "The Absent Link" which was presented to the Association.

"The Absent Link" was produced to accomplish several aims:

1. To make the general public aware of the athletic training profession.
2. To convince parents and school administrators of the need for employing certified athletic trainers on secondary school faculties.
3. To encourage young men to consider a paramedical career in the field of athletic training.

The film may be obtained by writing the National Office in Lafayette, Indiana, or the Kendall Company, Sports Division, 20 Walnut Street, Wellesley Hills, Mass. 02181.

Meeting adjourned.

Tuesday, June 13, 1972

The second session of the Board of Directors' Meeting of the National Athletic Trainers Association convened at 1:25 P.M., in the Spirit of St. Louis Room, Stouffers Riverfront Inn, St. Louis, Missouri with Mr. Bobby Gunn, President of the Association presiding.

Those in attendance:

District 1	Frank George
District 2	Francis J. Sheridan
District 3	Joseph Gieck
District 4	Roland E. LaRue
District 5	Byron J. Bird
District 6	Eddie Lane
District 7	Rodney Kimball
District 8	Lewis C. Crowl
District 9	Warren Morris
District 10	Dan Olesevich
President	Bobby Gunn
Executive Director	Otho Davis
Parliamentarian	Bruce Melin

XXXVIII. There was a discussion on a proposal from the Richard Rosen Company, New York City, publishers of guidance books in reference to the N.A.T.A. writing a book on the Profession "Athletic Training." The N.A.T.A. would be paid a royalty of twenty cents (20¢) for each book sold by Richard Rosen.

ACTION: Tabled.

XXXIX. Mr. Jim Bannister of the George E. Fern Company, Cincinnati, Ohio presented a report on the exhibits.

A motion was made by Mr. Sheridan and seconded by Mr. Lane, that the George E. Fern Company be awarded a contract for the management of the Exhibits Program of the N.A.T.A.

ACTION: Approved.

XL. The Professional Education Committee report, tabled on Saturday, was discussed for the Board by Chairman Sayers "Bud" Miller.

1. It was recommended that the Board accept the following athletic training curriculum:
 - a. Full Approval—*Undergraduate*
Ball State University
Northeastern University
Oregon State University
Southwest Texas State College
Texas Christian University
Washington State University
Western Illinois University
 - b. Full Approval—*Graduate*
Indiana State University
 - c. Three-year Probation—*Graduate*
University of Arizona

2. It was recommended that the Board approve the following revision in the Athletic Training Curriculum Approved Check List so that Step #4 on Page 1 should now read as follows:

In addition to the submission of the above information and documents, a personal visitation by a member of the NATA's Professional Education Committee may also be required. This visitation will be requested only if the members of the NATA's Professional Education Committee feel that further study of the submitted curriculum is needed after all of the required documents have been reviewed. The travel costs and expenses of the visitation will be a part of the responsibility of the university submitting their athletic training curriculum for NATA approval.

3. It is recommended that the Board of Directors of the N.A.T.A. approve the revised proposal of the Professional Education Committee for the N.A.T.A. endorsement of student athletic trainer and athletic training workshops, clinics, seminars, and conferences.

4. It is recommended that the Board of Directors of the NATA approve a continuing study (a survey every five years) of the salary range and status of the most recent graduates from athletic training curriculum.

5. It is recommended that the Board of Directors of the NATA approve a proposal that would allow NATA members who have held the classification of Certified Athletic Trainer for a minimum of five years but no longer actively engaged in the field of athletic training to maintain their membership classification or obtain a new membership classification with the same privileges as that of

the Certified Athletic Trainer if they continue to contribute to the field of athletic training as an instructor in an athletic training curriculum.

A motion was made by Mr. Sheridan and seconded by Mr. LaRue, to accept the recommendations made by the Professional Education Committee.

ACTION: Approved.

XLI The realignment of districts, tabled on Saturday, following reports by Mr. Crowl and Mr. Olesevich was discussed.

A motion was made by Mr. Crowl and seconded by Mr. Gieck that the realignment of districts be as follows:

DISTRICT 7

Arizona, Colorado, New Mexico, Utah, Wyoming

DISTRICT 8

California, Nevada, Hawaii

DISTRICT 10

Alaska, Idaho, Montana, Oregon, Washington, Alberta, British Columbia, Saskatchewan

DISTRICT 1

Quebec added to present states

DISTRICT 4

Manitoba and Ontario added to present states

ACTION: Approved.

XLII Detroit, Michigan was discussed as the site for the 1977 Convention.

A motion was made by Mr. Gieck and seconded by Mr. Olesevich to accept Detroit as the 1977 Convention.

ACTION: Approved.

XLIII Mr. Mel Blickenstaff presented a report on the Recruitment Committee.

A motion was made by Mr. Lane and seconded by Mr. LaRue to accept the report.

ACTION: Approved.

XLIV There was discussion on the use of the N.A.T.A. logo on a watch face and the sale of watches, handled through the National Office.

ACTION: Tabled.

XLV There was a discussion on the possibility of using the N.A.T.A. logo on decals which would be sold to the members through each District Secretary.

A motion was made by Mr. Gieck and seconded by Mr. Sheridan for the Executive Director to in-

vestigate the cost and act accordingly.

ACTION: Approved.

XLVI Mr. Gordon Graham, Chairman of the Research and Injury Committee, requested a budget of \$500.00 to begin searching where grants and funds may be available for research.

A motion was made by Mr. Kimball and seconded by Mr. LaRue to accept the request.

ACTION: Approved.

XLVII A request was made by the Membership Committee to the Board of Directors that Mr. Lewis Crowl be permitted to remain on the Board of Directors from District 8, as he was a member of the Board when the definition of "actively engaged" in athletic training was included as a requirement to hold office in the Association. There is to be further study on this by the Membership Committee and a recommendation made at a later date.

A motion was made by Mr. Lane and seconded by Mr. Gieck that the Board of Directors accept the recommendation of the Membership Committee requesting that Mr. Crowl remain on the Board of Directors during his present term of office; that the Board of Directors endorse Mr. Crowl's remaining on the Board; that no precedent is being established; and that this action is being taken only because Mr. Crowl is presently a member of the Board of Directors and was a member of the Board of Directors when the decision was made to require all officers and representatives of the Association to be "Actively Engaged" in the profession of athletic training.

ACTION: Approved.

XLVIII There was discussion on a proposal from the Bike-Kendall Company for awards to the Helms Hall of Fame and Twenty-Five Year Award members.

A motion was made by Mr. Morris and seconded by Mr. Olesevich that Mr. George Sullivan, Honor Awards Chairman meet with Bike for further details and report to the Board the complete proposal.

ACTION: Approved.

XLVIX A motion was made by Mr. Gieck and seconded by Mr. George to adjourn the board meeting. This motion was approved and the Board adjourned at 4:00 P.M. June 13, 1972.

ISOKINETICS *As Opposed to Fixed Weights*

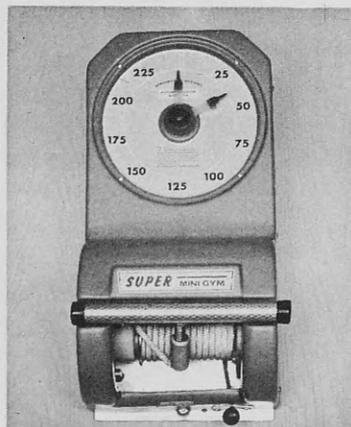
Isokinetic resistance is ideal for Trainers. The resistance accommodates to the impaired part of the body because it is only equal to the force capacity of that injured area. This unique resistance is accomplished with a controlled speed braking mechanism that allows the patient to exert maximum effort, yet at the same time, can never exert what he is able to do at that specific angle, with that specific repetition.

The Isokinetic or "accommodating resistance" gives automatic adjustment for pain or fatigue and automatic progression in perfect pace with an improvement in capacity. A safer approach for the patient as he can never overdo his immediate capacity and it is virtually impossible for him to experience joint or muscle discomfort. A quicker approach for the Trainer because there are no exerciser adjustments to make, none to release as the different patients utilize the units for rehabilitation.

ACCOMMODATOR DIAL

Model #125T — measures 5 to 65 lbs.

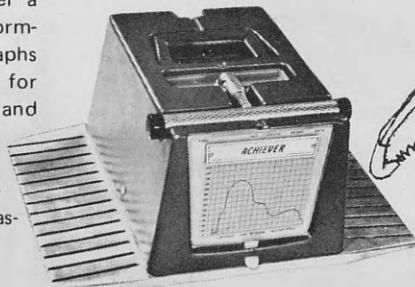
The Accommodator Dial easily detects arm and leg muscle weakness or strength through a full range of motion — with two hands similar to that of a clock. The first hand travels to one's peak effort, while the second hand fluctuates with the effort exerted throughout the range of motion.



ACHIEVER MODEL

Model #300T — measures 5 to 70 lbs.

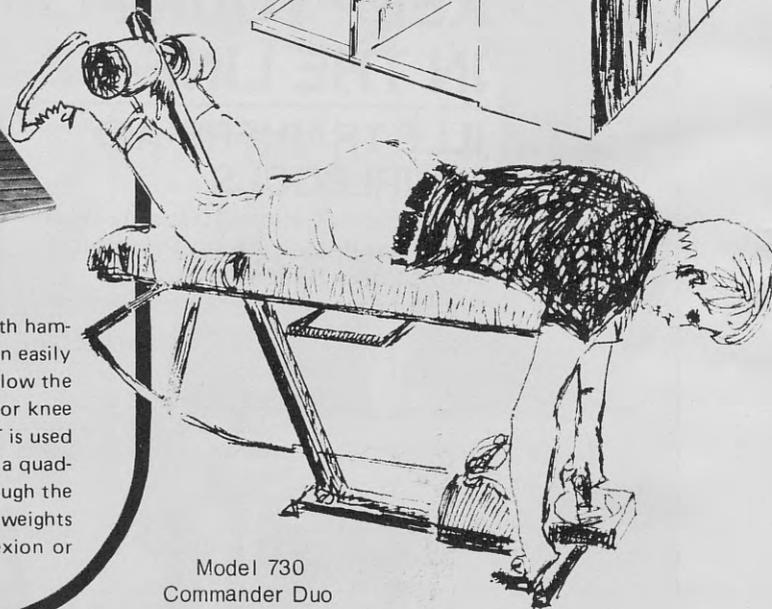
The Isokinetic Achiever model with its pen marking mechanism provides a continuous graph tracing of the user's strength over a range of motion, measuring muscle performance with great accuracy. The paper graphs are easily inserted and may be retained for permanent record, yet may be reinserted and new tracings made with different colored pens for comparison. The recoil mechanism makes possible quick repetitive exercises. There is no setting or releasing of tension.



"COMMANDER DUO"

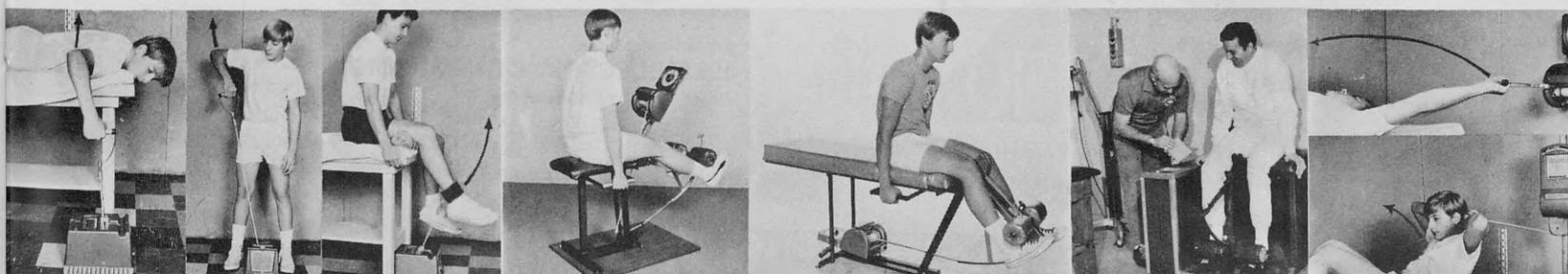
Model #730

The "Commander Duo" Model 730 Hamstring Exerciser is designed for both hamstring and quadricep exercise. As the patient does knee flexion, the individual can easily view the amount of effort he is exerting as the exerciser is stationed directly below the table. The seat slides back and the quadrant readjusts so the table is useable for knee extension as illustrated below. The Accommodator Dial Model #125A or #125T is used for this application. All isokinetic knee flexion and extension exercisers utilize a quadrant so the resistance always remains at the same position as one moves up through the range of motion. This feature is not available with other knee units as they use weights for the resistance and they lose their resistance as the user extends to full flexion or extension.



Model 730
Commander Duo

Model 700A or 700T
"Rehab" Table



Potpourri

KEEP A COOL HEAD

Dr. Sarah Nunneley at Ohio State University conducted studies that indicate we are all pretty hotheaded individuals. Dr. Nunneley states that the head represents about nine per cent of the body surface area, has a rich blood supply, and the highest heat flow of any body region except working muscle. The head is also different from most other areas in that blood vessels in the scalp remain dilated in a cold environment.

Head studies indicated that cooling the head removed 30 per cent of metabolic heat while resting and 19 per cent of heat while working.

AEROSOL CAN HAZARDS

Medical case histories are raising the possibility that aerosols may endanger our health. The American public uses aerosols for just about everything with no thought of danger, but some doctors are

beginning to fear the millions of tiny particles spewed into the air. These particles contain chemicals which, until now, rarely intruded the human body. As a result many health experts feel that aerosol sprays may damage heart, lungs, or eyes and may even lead to death.

Five case histories were used in a recent article to illustrate the point. (1) A young active sports woman, nonsmoker, complained of shortness of breath and loss of endurance. The cause was related to the use of an underarm deodorant spray. (2) A hairdresser, using aerosol hair sprays, developed similar symptoms from scar tissue covering much of her lungs. The damage resembled that seen in lungs of workers who spray lacquer finishes on miscellaneous items. (3) The 15-year-old who was sniffing aerosols and died from ventricular fibrillation was only one of more than 120 "sniffing" deaths recorded by the Food and Drug Administration. (4) A 38-year-old man died from the same

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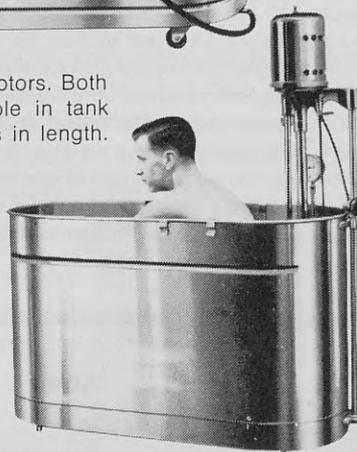


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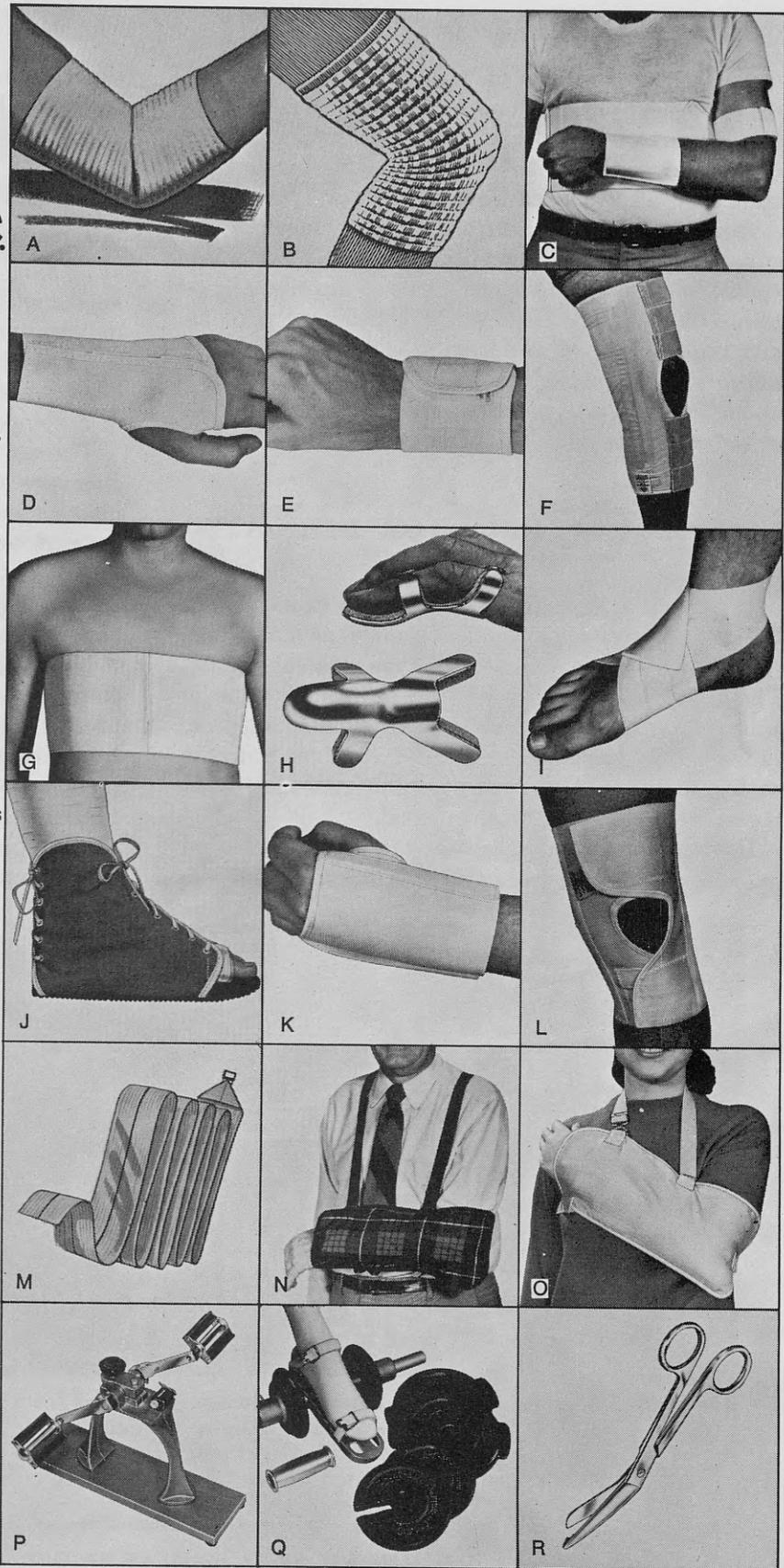


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- B. **Arthro-Pad**—Joint support with double thickness of Tubigrip and foam lining.
- C. **Raymond Shoulder Immobilizer**—8"; made of highest-quality elastic with Velcro closure.
- D. **Elastic Wrist Support**—Universal size. 2½" adjustment, with Velcro closure. Right or left.
- E. **Elastic Wristlet**—Universal size, 2½" adjustment. Velcro closure.
- F. **Knee Support**—With posterior stays. Velcro closure.
- G. **Deluxe Rib Belt**—Flexible stays, darted for anatomical form fitting; 6"; highest-quality elastic. Velcro closure.
- H. **Redi-Around**—The handy finger splint. Malleable extenders eliminate adhesives. Aluminum and foam padded.
- I. **Ankle Support**—Heavy elastic with Velcro closure. 3"; unstretched lengths 20", 19", 18", and 16".
- J. **Orthopedic Fracture Walker**—For cast applications or post-operative surgery. One of many advantages is no trouser slitting necessary for use.
- K. **Elastic Wrist Band Support**—With malleable aluminum stays, and Velcro closure. Right or left.
- L. **Elastic Knee Support**—With flexible medial/lateral stays. Velcro closure.
- M. **Blue Line Bandages**—Elastic webbing. Unique blue guide line for self-bandaging.
- N. **Arm Slings**—Popular standard and plaid models. Also available in cradle, single-strap plaid, and disposable models.
- O. **Velpeau Shoulder Dressing**—Slide buckle adjustment provides for positioning various degrees of adduction to horizontal.
- P. **Ped-L-Exerciser**—Portable with resistance adjuster and counter.
- Q. **Rx-Dumbbell**—Combinations for exercising muscles and joints.
- R. **Medi Bandage Scissor**—5½" size cuts six layers of stockinette, 7¼" cuts eight layers. Stainless steel.



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cause by an overuse of a spray bronchodilator. (5) A 65-year-old man had to be taken to the hospital with severe acid burns on his eyes after constant use of an aerosol disinfectant air freshener that contained a form of carbolic acid.

According to Dr. Bertrain Carnon, head of occupational and environmental medicine at the University of Illinois Medical School, anything contained in an aerosol should be considered potentially hazardous. More research is needed to determine total effects; however, there is definitely enough evidence to warrant care and discrimination in the use of aerosol products.

NONSURGICAL HELP FOR HERNIATED DISCS

Less than a thousand patients have been treated by an experimental process known as chemonucleolysis, not yet available to the general public. The FDA has authorized only a few orthopedic and neurosurgeons to use the injectable enzyme, called chymopapain. It is used only on patients with a ruptured disc and the understanding that the procedure is still experimental.

Results so far indicate that 90 per cent find relief of symptoms from the treatment. This was

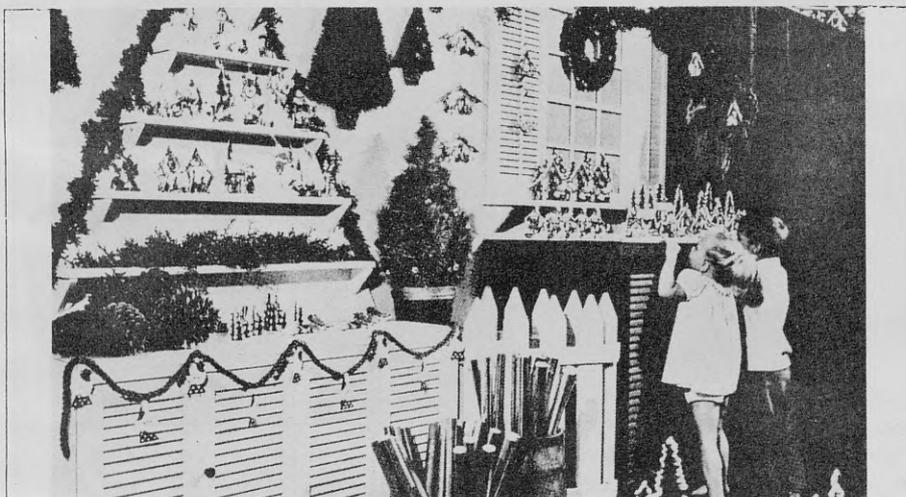
the treatment that the Chicago White Sox third baseman, Bill Melton, underwent in his attempt to return to active status sooner.

IN DEFENSE OF HEXACHLOROPHENE

An AMA committee would like to see the Food and Drug Administration soften its restrictions on hexachlorophene. The committee felt that the moves against hexachlorophene are unfortunate because it fills a health need with scientifically documented effectiveness and there is an absence of a comparably effective and safe substitute.

There was no objection to the FDA's advice that cleansers with two to three per cent hexachlorophene should not be used on infants since there appears to be no reason to apply any antibacterial agent to the skin of the normal new born infant. Outbreaks of infections could be controlled by personnel washing with antibacterial agents.

Dr. Naomi M. Kanof, chairman of the AMA committee, said the panel wants hexachlorophene products to remain available without prescription but with a label warning to prevent misuse. "We have more clinical experience with hexachlorophene than with any new antibacterial products you could replace it with," she said. "When used properly, it's not a toxic drug."



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(Continued on page 168)

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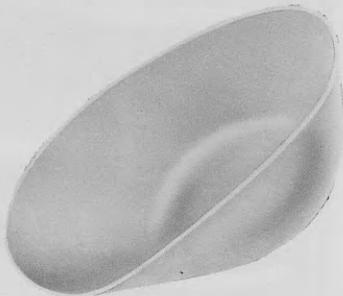
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FOOTBALL HELMET SAFETY STUDY

A study conducted by the National Operating Committee on Standards for Athletic Equipment concentrated on the effective levels of head protection afforded by existing helmets. Twenty-one types of helmets from seven manufactures were studied. It is reported that manufacturers already have and are acting upon the results of the test.

Some of the conclusions of interest to trainers might include: (1) There is a wide difference in the performance of helmets, even among the same types, (2) most helmets showed a degradation of performance during each successive impact, (3) current design of helmets has reached a point where the majority of them provide concussion protection up to levels rarely exceeded, (4) both the best and worst helmets were resilient padded, indicating that it can be misleading, for example, to lump together in injury statistics a particular type of helmet made by different manufacturers.

CONGRESSIONAL DRUG PROBE

A congressional investigating subcommittee will probe alleged widespread use of drugs in organized sports. Representative Harley O. Staggers made several comments in connection with the problems of drugs. He said that he was encouraged by anti-drug efforts being made by sports leaders, but he questions if enough was being done as quickly as desired.

"Sports has always called into play qualities which are most admirable in the human spirit. All this is jeopardized when drugs are used to artificially stimulate performance." Staggers stated.

DRUG PAMPHLET FOR COACHES

The NCAA has published a 16-page informational pamphlet on drugs for coaches. It contains some basic concepts and history of drugs used in athletics. It discusses the different drug forms, how to recognize their use, and what the coach can do.

Copies of this pamphlet can be obtained for 25¢ a copy from NCAA, 1221 Baltimore, Kansas City, Missouri, 64105.

Financial Aid and Assistance

A Report by the N.A.T.A. Committee On Education Grants and Scholarships,
William E. "Pinky" Newell, Chairman

NOTE: Many of us answer letters of inquiry from young men and women each year seeking financial assistance in pursuing further education. This report has been prepared in capsule form to answer some of the many questions asked.
—William E. "Pinky" Newell

1. In today's "tight money atmosphere" many prospective students are experiencing difficulty in obtaining enough money to finance their college education.

It is possible in many cases to obtain needed financial aid, however, if you are aware of the various sources of aid available to students.

The National Athletic Trainers Association, in an effort to better serve our athletic training programs, offers the following as a guide only; students must develop their own assistance programs with the help of their teachers and guidance counselors.

Because most student financial aid is dispersed on a first come, first serve basis, it is extremely important to begin college selection preparation during your high school years. The beginning of your Junior year of high school is a good time to talk to your high school counselor about which college is right for you.

After choosing a college, it would be advantageous for you to start seeking the needed financial aid before the end of your Junior year.

SCHOLARSHIPS

2. This form of aid is keenly sought by many students entering college because there is no obligation to pay it back. Originally, scholarships were awarded on the basis of scholastic excellence. But, today, scholarships may also be obtained by the demonstration of athletic training ability, musical ability, or other unique talents, and, in many cases, financial need.

Scholarships are offered by colleges and off campus groups, churches and synagogues, business concerns, labor unions, parent teacher associations, veterans associations, and other organizations.

EDUCATIONAL OPPORTUNITY GRANTS

3. A Federal Grant program provides \$200.00 to \$1,000.00 for an academic year to undergraduate students of exceptional financial need.

Colleges participating in this program determine a student's eligibility on the basis of financial need, rather than scholastic excellence.

The College also provides a matching award

equal to the EOG money. Grants do not have to be paid back.

COLLEGE WORK STUDY

4. At some schools, students are given part-time employment of fifteen (15) hours per week while attending classes full time. During vacation periods the student may work up to forty (40) hours per week.

On campus or off campus jobs may be offered to the student at rates varying from the minimum wage to \$3.50 per hour.

NATIONAL DEFENSE STUDENT LOANS

5. In this loan program administered by the Federal Government, students may borrow \$1000.00 per academic year, up to a combined total of \$5,000.00. Re-payment and interest do not begin until nine (9) months after completion of school. The interest is on an annual percentage rate of 3% on the unpaid balance, and a student may take up to ten (10) years to pay back the loan.

For those graduates who go into full time teaching service, the loan will be forgiven at a rate of 10% per year for five (5) years. In other words, 50% of the loan does not have to be paid back, and payments on the remaining 50% begin five (5) years after full time employment as a teacher.

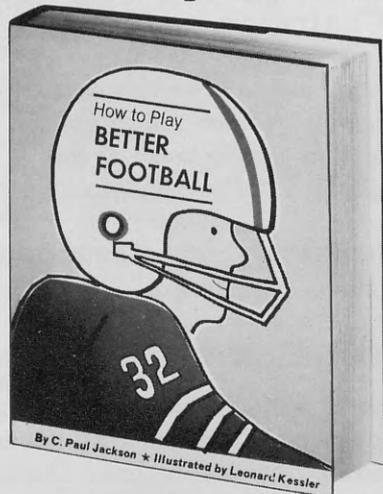
The loan is also forgiven at a rate of 15% per year with no limitation on the number of years for teachers of handicapped or low income children. In this case, the loan need not be paid back.

If, after completion of school, a borrower serves in the Armed Forces, the loan will be forgiven at the rate of 12½% for each year of Service up to a maximum of 50%.

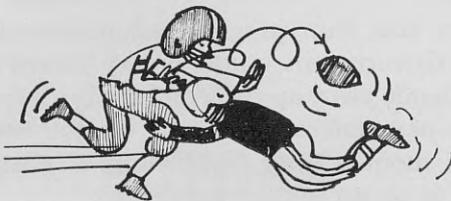
FEDERAL INSURED STUDENT LOANS

6. Under this program, a student may borrow up to \$1500.00 per academic year to a combined total of \$7500.00 (outstanding principal at any time, from banks, Savings and Loan Associations, pension funds, credit unions, insurance companies, and educational institutions). The payment

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period begins nine (9) to twelve (12) months after the completion of school and normally lasts for a duration from five (5) to ten (10) years. There is an interest rate not to exceed 7% on this type of loan which in many cases is paid by the Federal Government while a student is in school.

Many banks participating in this program require depositor status of either the student or his parents for a period of at least six (6) months prior to loan application.

UNITED STATES AID FUNDS, INC.

7. Students who have completed their Freshman year may borrow under this program. A maximum of \$1,000.00 per year, or a combined total of \$3,000.00 may be borrowed upon recommendation by the college.

SHORT TERM COLLEGE LOANS

8. Some organizations and individuals provide money to colleges for the express purpose of offering short term loans to students who experience temporary financial difficulties related to educational expenses.

ADDITIONAL FORMS OF AID

9. Many scholarships, grants and loans will be offered by the National Athletic Trainers Association to students going into the specific field of study of athletic training. Most of this aid will be awarded on the basis of financial need, *but cannot be offered at the present time.*

One other important form of aid is the GI Bill offered to returning Servicemen. If you are undecided about your Military obligation, it may be beneficial for you to fulfill this obligation first, then attend college afterwards. Veteran education benefits will pay you a monthly allowance while you are attending school for a period up to thirty-six (36) months.

WHERE TO GET HELP

10. For additional information on any or all forms of aid, consult your high school guidance counselor and write to the Director of Financial Aid at the college of your choice.

There is also a handy publication available which gives a detailed listing of participating colleges and universities in federal financial aid programs. It also provides information on many other sources of financial aid.

This publication may be obtained by sending \$1.00 to the Superintendent of Documents, Washington, D.C. 20402 and requesting the publication entitled "Financial Aid for Higher Education" (Order No. FS5. 255:55056).

WHY Colorless Tuf-Skin?

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Bill Chambers, Head Trainer, Fullerton Junior College, California, says, “I have tried to test Colorless Tuf-Skin under every condition possible. The results are that I feel that it would be a great product to add to your line. If I were ordering right now, I would specify “Colorless Tuf-Skin”. It does not leave a black build-up on the feet, it is easier to tape to, the athletes like it better, and there is less itching.”

The late Ernie Biggs, Head Trainer, Ohio State University, said, “We used nothing for three days but Colorless Tuf-Skin on the entire squad for all types of bandages and tape jobs in preparing for practice. Nearly all players felt it was tackier, spread smoother, and adhered better. Generally preferred to any other adherent.”

Elmer Brown, Head Trainer, Texas Christian University, says, “In my personal opinion, it is much better than regular Tuf-Skin because the tackiness is less gummy and the drying time is shorter. The ability to help tape stick was very good. The valuation of color is an excellent idea. This is one thing the kids mentioned all the time—no coloration.”

Bryon Bird, Head Trainer, Oklahoma State University, says, “Over a period of two months I have tried to compare Colorless Tuf-Skin with another product. Our boys are sold on your new product.”

It is packaged in two new convenient sizes—the slim pocket—fitting 10 oz aerosol can, and the handy, economical 16 oz. size for the training room. Available now from your favorite sporting goods store.



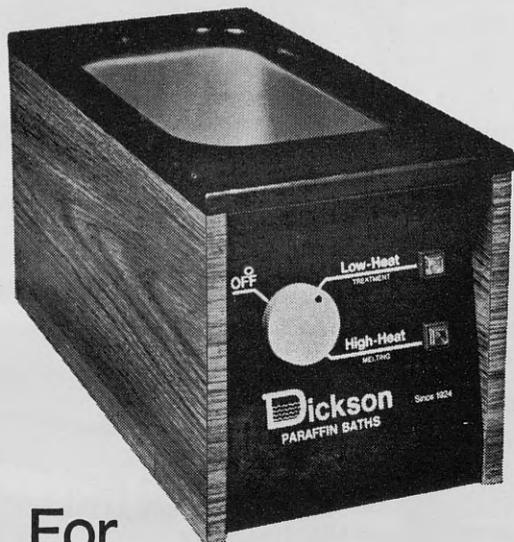
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Abstracts

“New Dimensions in Physical Activity and Fitness for Girls and Women,” Brown, C. Harmon, *American Corrective Therapy Journal*, Vol. 25, No. 3, pp. 68-70, May-June 1971.

The emphasis of the study is concerned with decreasing cardiovascular disease in women through the use of exercise. The two areas of training studied were endurance training for cross country and strength training for the throwing events.

The experimental group trained four to six times per week averaging four to seven miles per day. The results indicate that an initial one per cent of body weight was lost during the first six weeks. However, this was regained and an additional one per cent gain was realized at the end of the season. The control group gained two and one-half per cent during the period of the study.

No significant changes in heat rate took place during either maximal or submaximal exercise levels. This suggests a non-significant change in stroke volume in children during short periods of training.

In a second study of older track women the body fat measurements revealed $11.7 \pm 4.5\%$, which is half that of the normal female. The combination of the two studies clearly indicate that a program of long distance running can have profound effects upon the functional capacity of young women.

Studies of strength training for women athletes in the throwing events revealed little increase in arm or leg girths. In the more obese subjects the girth actually decreased. Lack of hypertrophy is attributed to the decreased amount of androgen produced by females (about 10% that of males).

The studies reveal that women can maintain high levels of fitness and still maintain their feminine attributes.

B. Flentje

“The Role of Physical Education in Preventive Medicine,” Bosco, James S., *American Corrective Therapy Journal*, 25: 97-98, July-August, 1971.

Physical education has shown that it can improve specific physical fitness components such as strength, balance, agility, flexibility, power, muscular and cardiovascular endurance, but this is

quite a different matter than proving that physical education has prevented medicine, that is, that somehow by improving these fitnesses, it has mitigated against future medical treatment in an individual. All one needs to do is visit a typical athletic training room and he might conclude that physical education actually contributes to medical treatment rather than preventing. Research findings regarding the relationship of exercise to health have given new dimensions to the work of the physical educator. It has long been suspected that a positive relationship existed between exercise and health, but when pressed for proof, the profession had been unable to produce it. The evidence is now mounting and has increased greatly the possible significance of physical education to the health and welfare of future populations.

Medical and health scientists, social economists and physical educators seem strangely unaware of the fact that for years, effective mass prevention has been practiced systematically and successfully on a large scale in such countries as Austria, East

and West Germany, and the Soviet Union. These programs send workers to mountain or beach resorts for one to three weeks, under medical supervision, all at the expense of the individual's insurance company. In the United States, prevention through exercise has been practiced largely at the academic level, if at all. The physical education profession, particularly that segment of it associated with educational institutions continues to devote a tremendous amount of its energies and resources to the production of a few "super beings" that is, champion athletes, rather than the hum-drum concept of physical fitness and development and health maintenance of people in general. Greater emphasis by the physical education profession on the physical fitness of the general public, combined with the medical profession's increasing willingness to include degenerative diseases as well as contagious diseases under the umbrella of preventive medicine, are bound to improve the future functional health of the nation's citizenry and, therefore, truly prevent medicine. *John Wells*



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STATEMENT of OWNERSHIP, MANAGEMENT AND CIRCULATION (Act of August 12, 1970, Section 3685, Title 39, United States Code).

1. Title of publication: Athletic Training
2. Date of filing: September 13, 1972.
3. Frequency of issue: 6 times per year.
4. Location of known office of publication: 3315 South Street, Lafayette, Indiana 47904.
5. Location of the headquarters or general business offices of the publishers: 3315 South Street, Lafayette, Indiana 47904.
6. Names and addresses of publisher, editor and managing editor:
 Publisher: National Athletic Trainers Association, 3315 South Street, Lafayette, Indiana 47904.
 Editor: Mr. Clinton Thompson, Dept. of Athletics, Colorado State University, Fort Collins, Colo. 80521.
 Manager Editor: Mr. Clyde Stretch, Dept. of Athletics, Michigan State University, East Lansing, Mich. 48823.
7. Owner: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given.)
8. Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities (If there are none, so state). None
9. For optional completion by publishers mailing at the regular rates (Section 132.121, Postal Service Manual).
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- Have not changed during preceding 12 months
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	Average No. Copies Each Issue During Preceding 12 Months	Actual No. of Copies of Single Issue Published Nearest to Filing Date
11. Extent and nature of circulation		
A. Total No. Copies Printed (Net Press Run)	3,000	3,000
B. Paid Circulation:		
1. Sales through dealers and carriers, street vendors and counter sales	—	—
2. Mail Subscriptions	2,733	
C. Total Paid Circulation	2,499	
D. Free distribution by mail, carrier or other means:		
1. Samples, complimentary, and other free copies	234	
2. Copies distributed to news agents, but not sold	—	
E. Total Distribution (Sum of C and D)	2,733	
F. Office use, left-over, unaccounted, spoiled after printing	267	
G. Total (Sum of E & F—should equal net press run shown in A)	3,000	

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