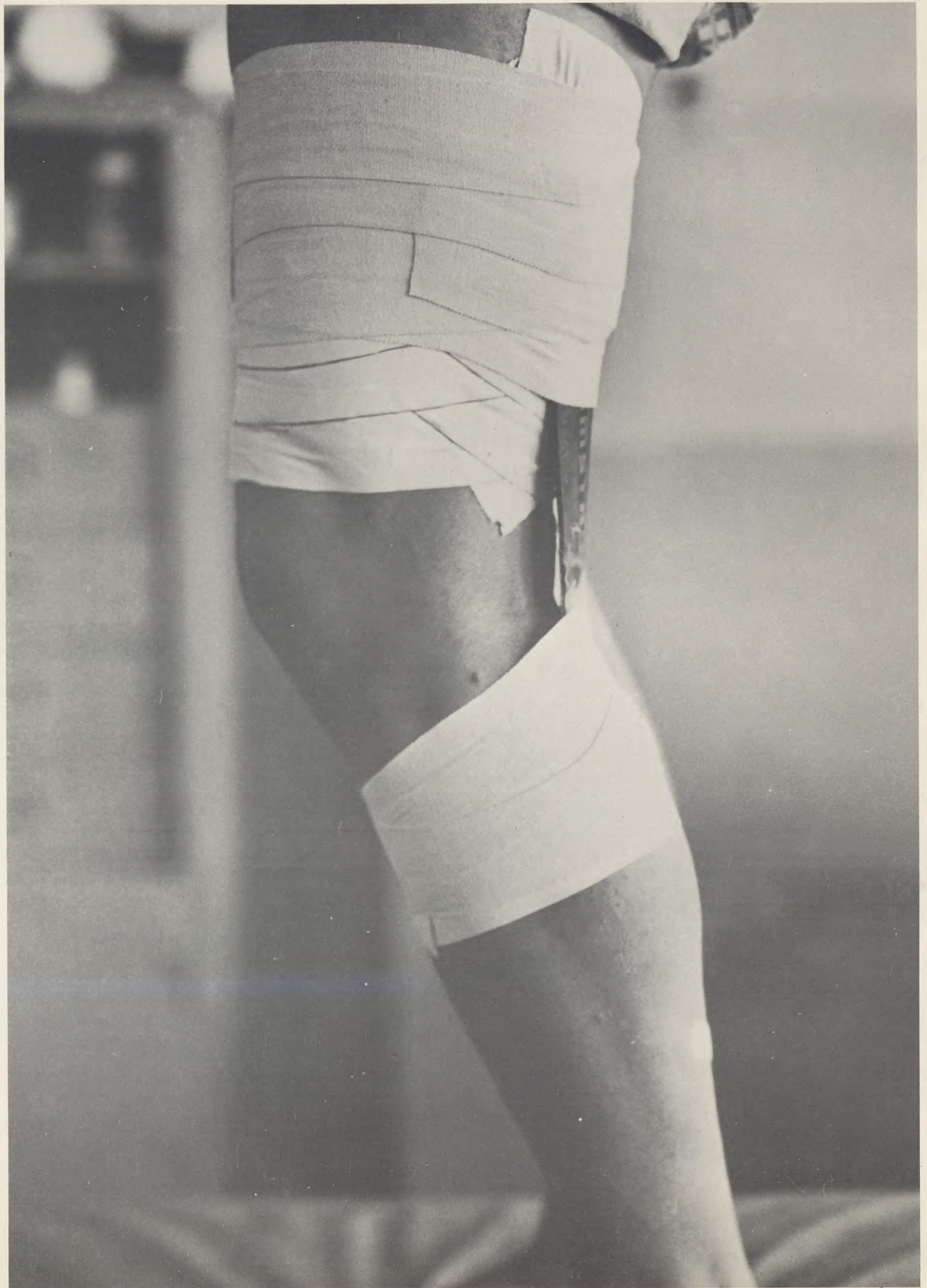


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TRAINERS

VOLUME 5

NUMBER 4

WINTER 1970



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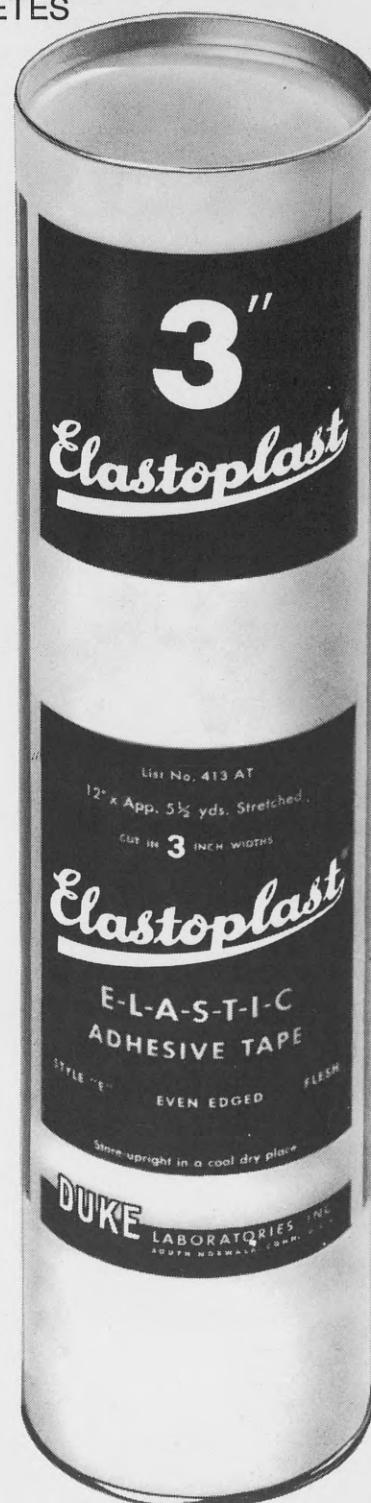
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Drugs: Their Use and Abuse by Athletes

Starting with this issue of the *Journal* the National Notes Column is being dropped, but will be replaced by an editorial by the Executive Director. The editorials will be current in nature, and may at times be somewhat controversial. It should be understood that these editorials are the thoughts and opinions of the Executive Director, and should not be construed as the thinking of the Association as a whole.

All of us are aware of the very real drug abuse problem prevalent in our society today. One has only to look around him, read the papers, watch TV, or listen to the radio, to be conscious of virtually unbelievable drug usage engaged in by persons of all ages. From the teeney-bopper "blowing grass" to the executive taking his "uppers" for work and his "downers" for sleep, to the all-out junkie shooting "speed" or "H", it is an equally serious and widespread problem.

The use of drugs in athletics from a therapeutic usage has been prevalent since the advent of sports. Unfortunately, the use of non-therapeutic drugs has also been all too prevalent. Recently a Mr. Theodore Irwin wrote an article for *Parade Magazine* entitled "Doping Athletes: Danger to Sports?", and in the October issue of *Today's Health* (the AMA publication) Mr. Irwin wrote another article entitled "High School Sports Flunk the 'Saliva Test' ". Mr. Irwin's articles are relatively well documented and contain some excellent statements by eminent people in the Sports Medicine field. Both articles also contain some unsubstantiated quotations and statements. The two main points that Mr. Irwin's articles make are: That the use of nontherapeutic drugs is very prevalent at all levels of competition, from high school through the pro ranks; and, that there never has been a true scientific study made which has shown that any of the stimulant drugs, the anabolic steroids or the myriad of other drugs being used to increase performance are truly beneficial. In fact these articles point out, as we should all be aware, that many of the drugs do

not only not help performance, but are actually detrimental to the individual's performance as well as to his health.

Mr. Irwin's final paragraph in the *Parade Magazine* article reads as follows: "None of our pro baseball, basketball, football or hockey leagues has rules banning doping; nor has the National Athletic Trainers Association laid down a policy. Doping is difficult to define, almost impossible to prevent; and so it continues. It may take a shocking scandal, involving the death of one or more U.S. athletes, to awaken the sports world to the doping menace. Meanwhile, not only the health of our athletes, but public confidence in the ethics of sports competition is in jeopardy." These are some rather harsh words, but unfortunately very true and to the point. At present the NATA President, Mr. Bobby Gunn, and the Executive Director are attempting to formulate and put on paper a statement regarding the use of non-therapeutic drugs. This statement will be presented to the Board of Directors at the January meeting for approval. In the September 15, 1970, issue of the *NCAA News* the NCAA's Committee on Competitive Safeguards and Medical Aspects of Sports presents a report on the condemning of non-therapeutic drugs used in sports. This report speaks not only of stimulant drugs and anabolic steroids, but also strongly advocates further research into methods of spot checking for the detection of non-therapeutic drug use in sports competition. The overall statement by this Committee is very good. I feel very strongly that the NATA's statement, when adopted and approved, should be as strong and as forthright as possible.

Even now, though we recognize this problem, we should all be aware of the dangers inherent with the use of these drugs; so, we must do all we can to completely stop the use of these non-therapeutic drugs. One of the best means of stopping this situation is by educating the athletes involved. Post articles, read articles to your teams,

have doctors lecture your squads; do everything you possibly can to decrease and eliminate this drug abuse and, at the same time, make your athletes aware of the fact that you care for them as individuals and are trying to help them become not only better athletes but better citizens.

Although the heat of late Summer and early Fall are practically over, I would like to mention one final word (for this year) about heat illness and death. Again this past season, there were all too many recorded incidents of heat illness and heat related deaths. The Winter and Spring months are the perfect times to educate your coaches, administrators, and athletes on the ways to prevent heat induced illness and death. Make it your project to be adequately prepared and to have a firm understanding with all you work with, as to how these heat problems can be eliminated before the next football season rolls around.

May all of you have a very Happy Holiday Season, and may the New Year bring you all happiness and success.

by Jack Rockwell,
Executive Director, NATA

LETTER TO THE EDITOR

Dear Editor:

Although there is some evidence to suggest that breathing of oxygen mixtures, during strenuous physical exertion can decrease blood lactate¹, significantly lower heart rates², and thereby increase time to exhaustion, there is ample evidence that the administration of oxygen prior to or after exertion has no demonstrable physiological effect either in increasing stamina or enhancing recovery³. As DeVries³ has pointed out, breathing oxygen during an athletic event is impractical. Yet, one still sees commonly on the athletic field, the practice of administering oxygen to players during a rest period.

Recently the data on 11 distance runners, who were studied in our laboratory, was analyzed in relation to the effect of post-run inhalation of 100% oxygen on pulse and ECG recovery times. Radio telemetered electrocardiograms were recorded at rest, immediately following a mild run, and at minute intervals up to 25 minutes post-race. These measurements were made on one day permitting normal recovery. On the subsequent day the same run was accomplished except that during the post-run recovery 100% oxygen was administered by mask inhalation for between 6-10 minutes. Electrocardiographic intervals, wave amplitude and duration, and segmental deflection measurements were made on such tracings and the results analyzed statistically. There was no significant difference observed in ECG and pulse recovery between breathing normal air and 100% oxygen. This was true of all of the parameters measured, with no exceptions.

These findings support the observation of Ebel², Miller¹ and others made during the past 10-20 years, findings which must apparently be continuously reiterated in the constant battle to separate fancy from fact in sports.

Kenneth D. Rose, M.D.
Chief, Division of Medical
Research

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The Rational Use of Thirst-Quenching Solutions in Athletics

by James L. Schamadan, M.D.
The Arizona State University
Tempe, Arizona

Within the past few years we have seen the advent of a new product marketed for the athlete (and even the thirsty non-athlete)—the “thirst-quenching” solutions. These solutions should more properly be designated as oral fluid and mineral replenishers. They come in a variety of colors and flavors, carbonated and plain, with and without sugar, (and vitamins) and all with varying concentrations of few or many minerals.

For many years there was widespread agreement among coaches that exercising athletes should *not* be permitted to drink fluids during practice or during “the game.” This older philosophy (whether correct or incorrect) has been replaced by the current realization that it is permissible, and in fact desirable, to allow the athlete to drink fluids during periods of exercise. I will not attempt to present both sides of the argument, but I will identify myself as one who believes in allowing the exercising athlete to drink enough liquid to replace his body fluids as they are lost . . . and who would insist upon the non-conditioned person doing likewise.

Therefore we arrive at this point—if you permit the athlete to drink, is there anything that is superior to just plain water? The answer is yes.

Let's combine our knowledge of physiology and chemistry with some common sense so that we can make some general recommendations and then develop an “ideal” solution.

BODY COMPOSITION

The composition of our internal cellular environment has descended from sea water—the seas have changed (gotten saltier, or if you prefer, some of the pure water has ‘evaporated’) but we have stayed the same. This internal fluid environment is a dilute solution of water, sodium, potassium, chloride, calcium, bicarbonate and other minerals. The concentration of each of these elements is maintained within very narrow limits. The kidney is responsible for this critical control function. In operational terms this means that if the proper minerals and water are made

available to the kidney, the kidney will regulate the water-mineral balance within the narrow limits necessary for proper function. It does this by selectively keeping what it needs of each commodity and then discarding the excess. This implies two things; first, that all the minerals and water must be available, and second, that the kidney must be functioning properly. Even though we are only half-way through this article, the strategy must already be clear to most of you—if you let the athlete drink, let him drink dilute solutions of the minerals his body needs (generally those minerals being lost) plus water . . . and let his kidneys do the selecting and regulating. However, if you make these solutions available to him it is also your responsibility to make certain that he has proper kidney function. With impaired kidney function, the body may not be able to prevent a harmful build-up of “friendly” minerals. Therefore, a primary recommendation should be that we include tests of renal function as part of our initial physical exam. Specifically it should be a routine urinalysis, i.e., color, sugar and acetone content, blood, specific gravity, and an evaluation of the microscopic content of the urinary sediment. If this exam is ‘normal’ there is reasonable evidence of normal renal function. Personally, I favor using an additional test to evaluate the ability of the kidneys to concentrate and dilute the urine. It is called the “concentration-dilution” test. If the kidneys can concentrate and dilute, this is excellent evidence of good renal function. Going for 6-8 hours with no fluid intake should produce urine with a specific gravity greater than 1.022; and intentional water loading by mouth should dilute the urine to less than 1.010. Your team physician can give you the exact details for conducting the tests. No expensive or complicated equipment is needed.

When an athlete begins training for a sport, the composition of his sweat and urine is different than it is after he is in “condition.” In other words, he adapts. Adaptation to heat stress can be produced by exercising for an hour a day for

(Continued on Page 25)

Ultrasound in the Treatment of Plantar Warts

by Roy A. Gilchrist, M.P.H., R.P.T.
Athletic Trainer, Duke University,
Durham, N. C.

and

Thomas B. Dameron, Jr. M.D.
Raleigh Orthopedic Clinic
Raleigh, N. C.

During a period of three and one-half years, we treated a total of forty-eight patients with plantar warts of the feet and toes.

Anticipating the time when we could report our results, we categorized patients in several ways. The first category is according to the age of the patient, either adolescent (under 21 years) or adult. The wart appearing in younger adults and children seems much more of an active type as opposed to the inactive hard-core appearing wart found in adults. The ages of the forty-eight patients ranged from two years to fifty-six years. The second category is that pertaining to the time of the wart's first appearance, within the previous three months, from three months to one year, or having been present for one year or longer. The third category selected is related to the number of warts. The presence of one or two warts on a patient's foot, making their appearance at or near the same time were considered single warts. When more than two warts were present, they were more apt to give the appearance of a "cluster" and also seemed to have made their presence one after the other as though sprouting from a parent wart. These we termed multiple warts.

The prescribed treatment was one of a tolerance dosage of ultrasound, with a maximum of 1 watt/cm², for ten minutes' duration, once weekly. Tolerance dosage is the maximum intensity the patient could tolerate comfortably. If and when discomfort was felt, the sound head was removed long enough for the discomfort to subside, then treatment was continued with the sound head in contact with the wart and moved in a circular motion. Massage lotion or mineral oil was used as the coupling agent.

To prepare the warts for treatment, they usually were pared or trimmed initially, removing any overgrowth or callous above skin level. This was done to insure better contact of the sound head with the wart itself and the surrounding tissue. We attempted to keep paring at a minimum; however, rapid formation of callous over the wart later in the course of treatments necessitated some further trimming.

As a rule, if the wart had not responded in eight to ten treatments, three weeks rest was given before resuming treatment.

The response we looked for during the course of treatment was a progressive maturation of the wart from an active growth to the appearance of black specks in the wart, separation around the edges, total darkening of the wart, and finally complete separation of the wart and the filling in of normal skin. We saw this response more readily in young adults and children. The adult's wart showed less dramatic change, usually very little change until the hard core separated and came out.

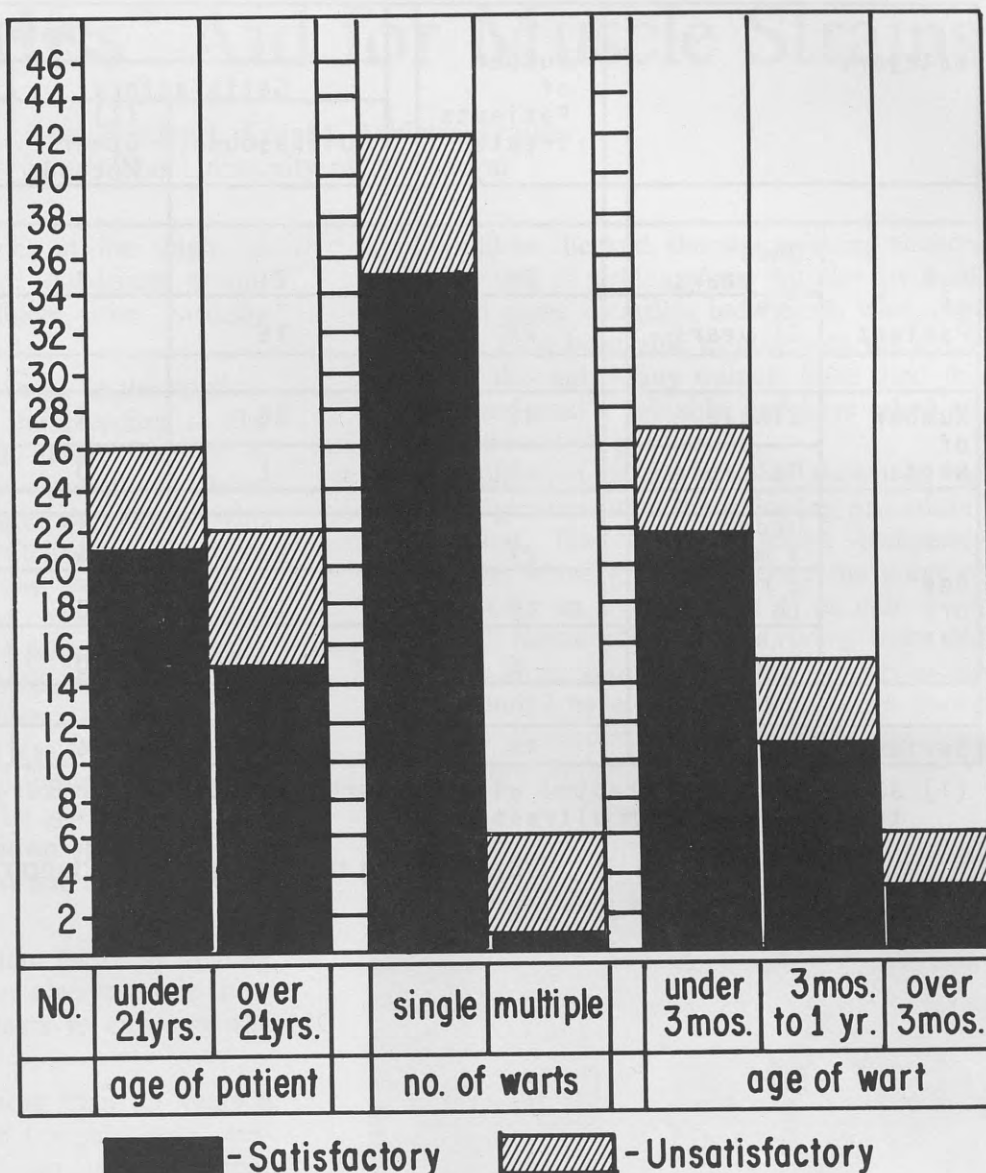
EVALUATION

In evaluating the results of the treatment, we considered only two possibilities. The results were either satisfactory in that the warts were completely removed, or unsatisfactory.

Of the forty-eight patients in the series, we considered the treatment results satisfactory in thirty-six of them. The results in nine of the patients were unsatisfactory, and in three patients the results are unknown because they did not return for the prescribed treatments.

Table 1.

Comparative Results
in the Treatment
of Plantar Warts
with Ultrasound.



Twenty-six patients in the adolescent group were treated, with satisfactory results in twenty-one patients and unsatisfactory results in five patients. In the adult group, twenty-two patients were treated. Satisfactory results were obtained in fifteen of the patients, while in seven patients the results of treatment were unsatisfactory. Only six patients were given more than twelve treatments, all of them adults, five of which were treated with satisfactory outcome. If an adolescent's wart had not responded favorably within twelve treatments, we considered the method unsuccessful and resorted to either electro-desiccation, surgery, or acid treatment.

The length of time the wart had been present prior to beginning treatment, seems to have had a bearing on the results. Twenty-seven warts which had been present for less than three

months were treated, twenty-two with satisfactory results, five with unsatisfactory results. Of fifteen warts which had been present for from three months to one year, eleven were treated with satisfactory results, and four with unsatisfactory results. Three satisfactory results and three unsatisfactory results were obtained out of six warts which had been present for more than one year.

Patients with single warts responded with thirty-five satisfactory results and seven unsatisfactory results out of forty-two patients. Six patients in the multiple wart category were treated, one with satisfactory results and five with unsatisfactory results. (See Figure 1).

As we have stated above, twelve of forty-eight patients responded unsatisfactorily, three of which did not return for prescribed treatment.

Category		Number of Patients Treated	Results			
			Satisfactory		Unsatisfactory	
			Ultrasound	(1) Other Methods	Unknown	Referred
Age of Patient	Under 21 years	26	21	3	2	0
	Over 21 years	22	15	1	2	4
Number of Warts	Single	42	35	4	3	0
	Multiple	6	1	0	1	4
Age of Wart	Under 3 months	27	22	4	1	0
	3 months to 1 year	15	11	0	2	2
	Over 1 year	6	3	0	1	2
Series Totals		48	36	4	4	4

(1) Satisfactorily treated with electro-desiccation or surgery following trial period with ultrasound.

Table 2. Ultrasound in the Treatment of Plantar Warts.

The nine known unsatisfactory results certainly bear mention as to disposition. Four of the unsatisfactorily treated warts were subsequently and successfully treated with surgical excision (1), or electro-desiccation (3). Four patients, all with multiple warts, were referred to dermatology for evaluation and treatment. One patient did not return in order that referral could be made (Table 2).

Taking only the thirty-six patients whose warts were treated satisfactorily, and looking at the average number of treatments required, we draw the following conclusions: For twenty-two warts present less than three months the average number of treatments was 7.8 per patient; for eleven warts present three months to one year, the average number of treatments was 9.4 per patient; twenty-one adolescents responded satisfactorily

averaging 7.6 treatments, while the average number of treatments in the satisfactorily rated fifteen adults was 10.3, a difference of 2.7 treatments.

CONCLUSIONS

Ultrasound therapy has been found to be a useful adjunct in the treatment of plantar warts. It is particularly of value in the single warts of the active type in your patients. It has been found of little value in the treatment of plantar warts of long duration under pressure areas (depressed metatarsal heads), particularly in recurrences following x-ray therapy or excision.

It does take longer than some other methods, but it has proven to be a safe, effective method of treatment. (Super omnia, nihil detrimenti faciamus).

An "Ole Miss" Aid for Muscle Strains

by Wesley I. Knight, Athletic Trainer,
The University of Mississippi

Pulled or strained muscles in the thigh, to either the hamstring or quadricep group, can incapacitate an athlete either partially or completely.

The immediate treatment must be the application of "cold" to control the bleeding in the tissues as either tape or an elastic bandage is applied from the end of the extremity to above the injury to support the injured part. Those with a severe tear are put on crutches for bathroom privileges and put in traction. We have found that this treatment, plus the cold packs or iced ace bandages for the first 24 hours, help physiologically. This treatment relaxes the muscles and hastens the absorption of edema so healing can start quickly. To those with less severe tears, the iced ace wrap is adequate support for walking. Specific instructions should be given to walk stiff legged, especially up and down stairs. This lessens the chance of more strain to the already injured muscles.

Time is always an important factor in treating any injury and the question always arises—how long?—especially in these tears to either of the muscle groups in the thigh.

I have been using for more than 25 years a support which I call a false (or substitute) tendon. At the present time I am using a rubber bandage which was made for the telephone company (specifications No. AT 6843—minimum length, 14 feet—manufactured by Fulflex, Inc., Bristol, R.I.). Previously I had used strips of innertubes, but due to the synthetic rubber, they were found to be less useful. This new product is stronger and more elastic and can accomplish the purpose.

The original reason for such a support came as a result of my having experienced a pull myself. As a track man (trainer and track coach) I knew that a wrap was only a psychological compression bandage around the girth of the leg. I realized that to get any real aid, it was necessary to put an artificial support in the line with the original course of muscles anatomically. Logically, this support would shorten the action of either muscle group. Most strains are in the belly of either group, so by applying this rubber above the area pulled, the complete extension of the

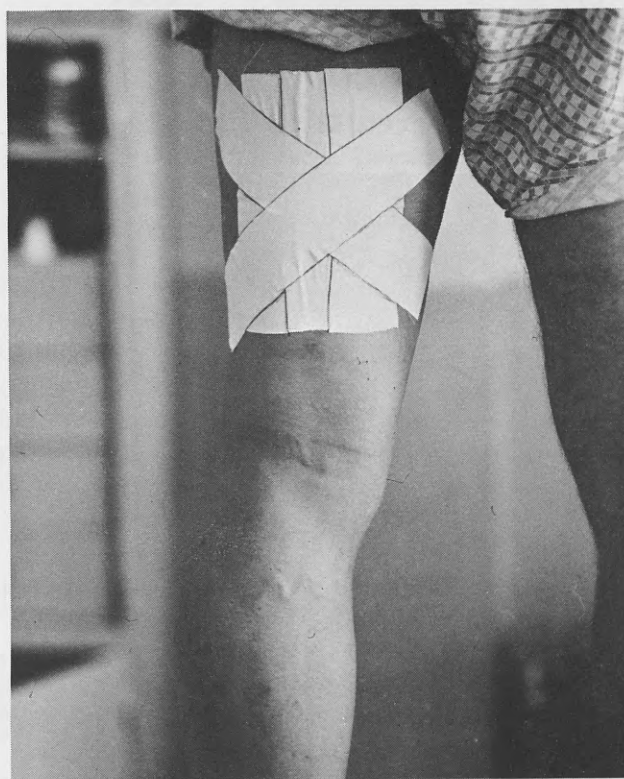
knee could be checked, thereby reducing chances of further pull or jerking of the muscles involved.

I could name countless individuals who, over the years, have been able to play with the application of this aid. Many trainers have used this wrap, have found it valuable, and have asked me to write about it for publication.

The application of the wrap is shown in the following pictures, with the following procedure:

(1) First, the thigh is shaved completely around the whole girth and above the point of tenderness for an area of about 4" on calf. Then I apply 2" elastic adhesive tape, going from just above the knee, applying a lifting support to the muscles until I have cored the whole area above the point of tenderness. Three strips are then placed below on the calf for a base.

PICTURE 1



Over Site of Pull

(2) The length of rubber depends on the length of boy's leg and how high up the leg the wrap needs to be applied. The length depends on how much hype-flexion the knee joint needs.

PICTURE 2



Basic Strapping on Thigh
Covering Below and Above Area
Either for Quad or Hamstrings

PICTURE 3



Lateral View Finished Support

(3) In the application of the rubber, it is very important to wrap the 2" elastic tape or some similar product, around the rubber three times so it won't pull loose. I then apply the rubber directly to the back of the thigh above the area involved so that the upper 2" of rubber is completely tied to the leg. I finish this off with adhesive tape so the elastic wrap won't peel.

(4) The rubber is then applied to the calf, but the elastic tape must be wrapped around the lower end three times and then applied to the calf as above on the thigh. However, the flexion of the knee is about 60 degrees so that when the wrap is completely finished it will check the extension of the knee. The application to each boy can vary, and the amount of flexion must be ascertained.

PICTURE 4



Rear View with Tape Covering
Elastic Wrap

I might say that my latest classic application was to Glenn Cannon, in the 1970 Sugar Bowl Game with Arkansas. Without Cannon the score might have been different, and without that wrap, Cannon could have played in neither the Sugar Bowl nor the Senior Bowl games.

In conclusion, I use this wrap in practice to help keep up muscle tone and allow a boy to work out at half speed, so that when he is ready to return, he is in good shape.

Effect of Ascorbic Acid on Endurance Performance and Athletic Injury*

Capt. George O. Gey, MC, USAF; Lt. Col. Kenneth H. Cooper, MC, USAF; and Robert A. Bottenberg, Ph.D.

It has been postulated that supplemental doses of ascorbic acid (vitamin C) may improve endurance performance and perhaps reduce the severity and morbidity of athletic injuries.¹⁻⁴ The present study was designed to answer these questions and to determine the long-term effects of a large supplemental dose of ascorbic acid in contrast to those of a placebo.

MATERIALS AND METHODS

Two hundred and eighty-six male officers (average age, 28.0 years) participated in this study while attending the 12-week Squadron Officers School, Maxwell Air Force Base, Ala. Each officer ran the 12-minute field test⁵ at the beginning of training and then was given a bottle containing either 500-mg tablets of ascorbic acid or a placebo. The bottles were numbered at random with a code that was kept in strict secrecy until completion of the study. The subjects were instructed to take two pills each day throughout the training period. Also, they were asked to keep a detailed record of all injuries sustained during the training period, which consisted of three weeks of preconditioning, and then nine weeks of competitive soccer, volleyball, and flickerball. The 12-minute field test was repeated at the end of training in order to document any change in endurance performance. No attempt was made to standardize the diet since the subjects lived and ate in the same general environment.

RESULTS

The majority of the 286 subjects in both the ascorbic acid and placebo groups took all the pills as directed. After 12 weeks of training neither the endurance performance nor the overall improvement as measured by the average distance on the 12-minute, walk-run test were significantly different (Table). Likewise, when the number and rate of injuries were compared, nei-

ther the total injury rates in the two ascorbic acid groups nor the total injury rates for the ascorbic acid and placebo groups were significantly different. Minor injuries were most common, but the percentage of injuries in both/or the ascorbic acid and placebo groups were remarkably comparable. The majority of the injuries persisted for eight days or longer, but there was no significant difference between the groups taking ascorbic acid or placebo when the duration of injuries was compared.

Performance on 12-Minute, Walk-Run Test

Pills Taken		At Beginning of Training		After 12 Weeks of Training	
		No. of Subjects	Distance (Miles)	No. of Subjects*	Distance (Miles)
All	Ascorbic acid	112	1.32 ± 0.23	111	1.65 ± 0.16
	Placebo	100	1.30 ± 0.24	96	1.62 ± 0.17
Less than one half	Ascorbic acid	29	1.20 ± 0.22	27	1.60 ± 0.15
	Placebo	45	1.34 ± 0.26	44	1.62 ± 0.17
Total	Ascorbic acid	141	1.30 ± 0.23	138	1.65 ± 0.16
	Placebo	145	1.30 ± 0.24	140	1.62 ± 0.17

*Five subjects were unable to take the final running test because of athletic injuries.

Comment.—The effect of a daily dose of 1,000 mg of ascorbic acid on endurance performance, and the rate, severity, and duration of athletic injury was studied. The effect was negligible when compared to that of a placebo. Perhaps the results would have been different if the subjects had been older or the physical activity had not included contact sports. Such questions remain unanswered, but the need for large, double-blind studies to answer such questions is apparent. Only in this manner can the true value of dietary supplements be ascertained.

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The ascorbic acid and placebo tablets were prepared by Eli Lilly and Co.

From the Aerospace Medical Laboratory (Clinical), Wilford Hall USAF Medical Center (Capt Gey and Lt Col Cooper), and the Personnel Research Laboratory (Dr. Bottenberg), Aerospace Medical Division (AFSC), Lackland Air Force Base, Tex. Dr. Gey is now at Baltimore City Hospital.

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World Amateur Wrestling Championships (FILA) Injury Report

by

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The 1970 World Wrestling Championships were held from the 4th to 11th of July at the University of Alberta in Edmonton, Canada. Edmonton at an altitude of 2,200 feet is situated in the North West of the prairie belt, and is, at this time of the year, hot and dry. Athletes from 38 countries competed and naturally there were a few problems associated with the different climatic and dietary conditions. There were two categories of wrestling at the championships, namely Greco-Roman and Free Style.

The following report was compiled from the records of only those wrestlers who presented themselves for treatment at the official medical center. This was staffed at all times during the week of competition. It should be noted that there were many injuries that were never brought to our attention since some countries sent a physician and trainer with their team. Certain countries were especially sensitive about any medical staff, other than their own, treating their wrestlers. Despite this, approximately 16% of the athletes competing presented themselves for the treatment of injuries. The medical staff for the championships consisted of four doctors, two therapists and two nurses. The number of competing athletes was 400 and these were accompanied by 150 officials who were not without their own particular medical problems. This report is presented in order to fulfill three aims:

1. To indicate the number and types of injuries observed at the tournament.
2. To indicate the need for continual coverage by medical personnel and adequate treatment facilities.
3. To suggest the type of equipment and personnel that should be available at other events of a similar nature.

Discussion

The diversity of injuries was surprising, but considering the vigorous nature of the sport and the amount of body contact, the number of severe injuries was small. This may be largely due to the excellent physical condition of the athletes. This last statement may seem superfluous since only top class international athletes were competing but the authors feel that from their wide experience with athletes in many sports, the physical condition of these wrestlers was second to none. It was unfortunate that some provision was not made to test these people for general fitness level. Tables I, II and III show a classification of the type of injuries seen at the clinic and table IV tabulates the percentage incidence. It must be pointed out that many wrestlers had not

Table 1. Classification of Injuries to Head, Upper Body, and Limbs.

AREA	TYPE OF INJURY	LOCALITY	NO.
Head	Concussion		2
	Laceration	Skull	2
		Periorbital	4
		Jaw	1
	Abrasion	Ear and Face	8
Neck	Muscular	Sternomastoid	1
		Trapezius	8
		Rhomboide	2
Shoulder girdle	Muscular	Deltoid	3
	Ligamentous	Acromioclavicular	4
	Dislocation	Gleno humeral	1
Arm	Muscular	Forearm flexor group	3
		Forearm extensor group	2
	Ligamentous	Medial Collateral ligament of elbow.	2
	Other	Forearm laceration	1
		Olecranon bursitis	1
Hand	Ligamentous	Metacarpophalangeal joint of thumb.	1
		Metacarpophalangeal joint of index finger.	1
	Fracture	Scaphoid	1
Thorax	Costochondral strain.	Rib 4	1
		Rib 7	1
Abdominal	Muscular	Rectus abdominis	2
Back	Muscular	Erector spinae	1
	Fracture	T.4. Lamina	1

This chart only tabulates the incidence of reported and treated injuries.

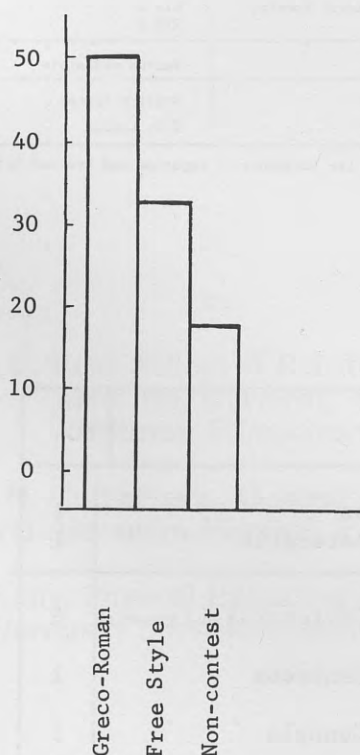
Table 2. Classification of Injuries to the Lower Limbs.

AREA	TYPE OF INJURY	LOCALITY	NO.
Thigh	Muscular	Sartorius	1
		Vastus Lateralis	1
Knee	Ligamentous	Medial Collateral Ligament	6
	Meniscus	Medial Meniscus	1
	Contusion	Medial Condyle	1
Leg	Muscular	Gastrocnemius	1
Foot	Ligamentous	Intermetatarsal ligament	2
	Blister	—	1
	Ingrowing Toenail	—	1

This chart only tabulates the incidence of reported and treated injuries.

CONDITION	Nos.
Gastro-Intestinal Disturbances	5
Post-infective Lymphangitis	1
Shock and Collapse	3
Fever (Non specific)	3
Post Injection Reaction	1
Genito-Urinary	1
Athlete's Foot	1

Table 3. General Conditions Presented for Treatment.



Those injuries not incurred during actual wrestling bouts are classed as non-contest.

Table 5. % Incidence of Injuries occurring in Greco-Roman vs Free Style Wrestling Events.

CLASSIFICATION	%
Muscular	30
Ligamentous	28
Laceration (requiring stitches)	10
Gastrointestinal	6
Concussions	2
Fractures	1
Others	23

Table 4. Major Categories of Injuries. Table to show % Incidence.

only chronic injuries on arrival but subacute and acute injuries were sustained in elimination bouts and during training. Considering the nature and duration of some of these injuries it is difficult to understand how team managers and coaches could expect these athletes to compete on equal basis with healthy athletes from other nations.

It would be assumed that the free style events would produce the highest incidence of injuries. The reverse was the case in this tournament, however. (Table V) This may be due to the great number of upper body musculature tears. Perhaps the extreme pulling and jerking motions required to produce a fall in Greco-Roman wrestling accounts for this. The obvious fatigue in these upper body muscles towards the end of a bout, caused by sustained and maximal contraction may also predispose them to tears.

Some conditions were treated only by drugs of various kinds. These were usually seen once for the initial examination and diagnosis and reviewed at some interval according to the condition, i.e. gastro-intestinal disorders. Most of the musculo-skeletal problems were treated between two and three times daily and in addition many athletes presented themselves for supportive strapping before a bout, in the absence of any physical damage. This was usually to the ankle, with a lock on inversion, the knee with medial support or the taping of two or more fingers together for protection of the metacarpo-phalangeal and proximal interphalangeal joints.

Some of the injuries will be discussed in more detail. Lacerations of the head were frequent and usually caused by the contact of the two wrestlers heads while attempting to move in close for a throw. At the time of the injury bleeding was stemmed, and butterfly tapes were used to keep the edges of the wound in apposition. Slight pressure was maintained by a gauze pad and elasto-plast strapping. As soon as the bout was completed most deep cuts were sutured since the wrestlers often had to fight again that same or the next day. One team trainer had plugged the cut at the time of injury with a caustic ointment. This left a wide and potentially permanent black scar. Healing of this wound could have been seriously delayed. In order to prevent this, the complete scar was removed two days later and the edges opposed using plastic surgery techniques. That method was chosen because the wrestler was in the hotel business and cosmetic appearance was important. This was a striking contrast to most wrestlers to whom scars and "cauliflower ears" were cherished as hallmarks of their sport.

Despite the fact that the upper trapezius musculature was considerably hypertrophied in all the wrestlers, tears in the parascapular and neck muscles were by far the most common. This is probably due to the jerking nature of many of the wrestling movements. It may be of interest that most tears appeared to be in the belly of muscle and not at the myotendinous junction as is seen with many sports.

On the spot attempts at relocating a dislocated shoulder and a locked knee due to meniscus problems by some team trainers were both futile and somewhat alarming to watch. Manipulations for both these areas require skill, practice and diagnostic acumen and are not to be undertaken lightly or hurriedly. In both areas manipulation may cause serious and permanent complications. At the shoulder fracture of the neck of humerus and circumflex nerve neuropraxia or axonotmesis are by far the most common. However, there is occasionally the athlete in whom recurrent dislocation is so common that he may be well able to administer his own maneuver to relocate the arm.

There was one incidence of a serious neurologic nature. A flexion injury of the thoracic region was caused by a fall where the body weight of one wrestler was superimposed on the other at the moment of impact with the ground. It should be stressed that immediately after the incident the wrestler was in a hyper-excitable state and was thrusting around with his arms, trying to sit up

and shouting in his own language. At this point it would have been extremely easy to overlook the apparently simple diagnosis. The neurologic signs were due to edema, and haemorrhage. These came on with increasing severity over a period of 30 minutes. They included atonia, areflexia of the lower trunk and limbs and anesthesia and altered sensation to various areas below the nipple line. He was taken to hospital where subsequently a laminectomy and decompression were performed. His recovery was excellent.

Wrestlers ears are particularly susceptible to damage by repeated minor trauma, i.e. small cuts and scratches. One case of subcutaneous, supracartilagenous edema and haemorrhage was treated that would obviously have led to a classic "cauliflower ear". A simple and effective method of treatment which is commonly used is immediate aspiration of exudate followed by the application of a cast of collodian and gauze for 10 days. Further aspiration at this time may be necessary. The need for an effective yet comfortable headgear is evident but as yet not forthcoming.

There were three cases of wrestlers' collapsing; two collapsed following some final bouts and one during training. The differential diagnosis in each case is difficult and the following factors are of significance:

a. Many athletes had reduced several kilos in a very short period of time. This was not achieved by controlled diet, but by dehydration produced by exercise in "sweat suits", and by steam and sauna baths. Some of these wrestlers spent several hours a day in the suana. Massive fluid loss probably was associated with a certain amount of electrolyte imbalance.

b. Athletes of this caliber have the mental ability to push themselves to the point of absolute fatigue. After the bout, sudden complete relaxation could have caused collapse from sheer exhaustion.

c. The extremely high temperature in the arena could have lead to over heating of the body so that continued activity caused "heat stroke".

d. It has been recorded that myocardial infarction has occurred even in very fit athletes, especially in the heavier weight classes.

e. The need to win and the concomitant feeling of failure when losing is felt very strongly by some athletes. The psychological reaction to losing a key wrestling match is often manifested by the wrestler finding some excuse. This may take the form of complaints of minor musculo-skeletal

pain. In the extreme it may show as hyperventilation which can eventually lead to collapse. In some ways this is akin to one type of acute psycho-somatic respiratory attack that may be seen in the asthmatic.

Of the three cases of collapse that occurred at this tournament the first was probably one of electrolyte imbalance and the wrestler was sent to hospital for laboratory tests and observation. The second was a definite psychological episode. The wrestler continually hyperventilated, thrashed his arms around and kept up a great vocal display. To the uninitiated this attack could be confused with a coronary or even epileptic seizure. This display was kept up for a period of 10 minutes and was relieved instantaneously by an innocuous injection administered intramuscularly by the team trainer. This was an obvious placebo effect.

The third case was potentially the most serious with the wrestler being semi-conscious for a period of nearly 15 minutes. His respiration was shallow, lips cyanosed and blood pressure low. He had a pulse rate of 40. There were signs of circulatory shock and possibly a minor heart attack. Oxygen and artificial respiration was given, and he was taken to hospital. On leaving the dressing room where he was treated his pulse was up to 80 and his blood pressure showed a rebound phenomenon being 180/140. He was breathing more deeply and responding to some degree. Cardiac involvement was ruled out by the hospital and the wrestler returned to his team later that day although he did not wrestle. It is the authors' opinion that this was a case of shock brought on by a combination of extreme exhaustion and emotional tension.

A member of one team was unable to train or compete because of the extreme pain from an acute infected ingrowing toenail. This was lanced under local xylocain block and a wedge of nail removed as far back as the nail bed. He was placed on systemic antibiotics. This expedient

procedure enabled him to compete in comfort and illustrated the advantage of having full medical staff and facilities available.

One point of interest was the spontaneous and random urine checks conducted by the medical team under the supervision of a senior medical officer of F.I.L.A. These were sent to the Provincial Toxicology laboratory to be tested for amphetamines. All tests were negative.

Ethyl chloride sprays of various types seem to be used with increasing frequency in all sports. Even understanding the rationale behind the application of the spray for temporary analgesia it is difficult to justify the indiscriminate spraying of everything and anything. It is this "dab a little on" attitude that reduces the effectiveness, and erodes the integrity of the athletic trainer. The authors have come to the conclusion that the ethyl chloride spray is the North American homologue of the English "bucket and sponge".

As a guide to future events of this nature several points have become evident:

1. The medical staff must include at least one doctor, therapist and nurse, depending on the size of the competition.
2. Continual supervision is necessary at the wrestling mats as well as in the treatment area.
3. An ambulance should be available and near by at all times.
4. A full and recently checked oxygen bottle should be kept in the treatment room. One member of the medical team should be familiar with its use, dangers and contraindications.
5. The main drugs needed are in the areas of analgesia and sedation. Four major categories were used: Analgesics, antibiotics, general relaxants and antacids.
6. Equipment for minor surgical procedures should be on hand. This must include scalpel, suturing set and some suitable area in which to work.

7. Ideally for the treatment of musculo-skeletal disorders there should be an ultrasound apparatus, hot packs, some shortwave equipment and whirlpools. Ice should be available as small blocks and in chipped or flaked form.

8. Several forms of tape for both protective, supportive and preventative strapping.

9. The treatment center is best situated in a position that is near to the training and the competition area.

10. Accurate records of all injuries and treatments are mandatory for safe and effective medical attention, and for future referral.

11. It is not enough to pick personnel simply on qualification. Experience and interest in the treatment of athletic injuries is important and an "in depth" knowledge of the sport is necessary if the wrestlers are to get not only the most expedient, but the most suitable treatment.

Conclusion

This brief survey has shown that the range of injuries to be treated at a tournament of this caliber is very broad, and on occasion of a very serious nature. From this the need for sufficient qualified personnel with the appropriate type of experience is evident. By far the greatest percentage of injuries occurred to the upper body, particularly the head. Only the knee provided a problem of any great proportion in the lower limb. (Table 6) The need for some form of protective headgear is perhaps overdue. The potential dangers of rapid weight loss by dehydration have been pointed out. With the tendency to put progressively younger persons into competition, this particular problem must be investigated more fully.

The provision of a well-equipped and staffed treatment area minimizes permanent injury. In summary, the authors would like to re-emphasize the excellent physical condition of the competing athletes and the possible effect this may have had

on limiting the number of injuries in wrestling where vigorous physical contact is a predominant feature.

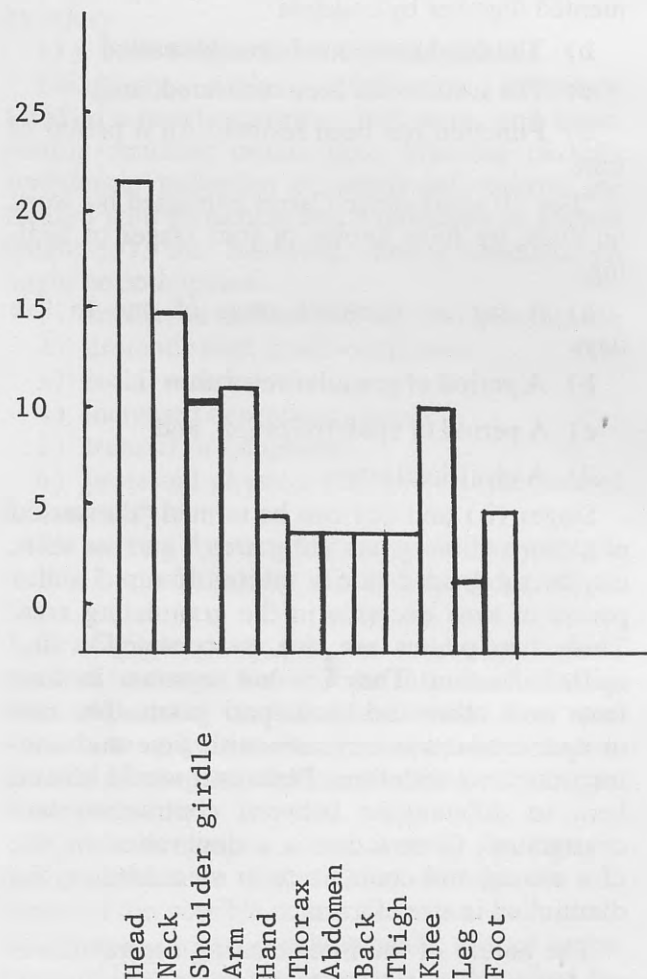


Table 6.

% Incidence of Injuries as they occurred
in various Body Segments.

Athletic Training in the Literature

In the April, 1970, issue of *Applied Therapeutics* (Vol. 12, pp. 10-14) David Roberts, a Resident in Plastic Surgery at Toronto East General Hospital presented a paper entitled "Wound Healing: A Scientific Review." His primary interest was, of course, the skin, but as the healing of wounds is roughly a general bodily function, some of the material presented is appropriate for athletic injuries.

"A wound is a result of a destructive process and is a structural deficiency in the bodily architecture. Wound healing is concerned with a restitution of architectural continuity and is felt to be complete when:

- a) The disrupted surfaces have been cemented together by collagen
- b) The dead space has been obliterated
- c) The surface has been recovered, and
- d) Function has been restored for a period of time."

"For 50 years, since Carrel published his work on dogs, we have known of four stages of healing:

- a) A lag or quiescent stage of one to five days
- b) A period of granular retraction
- c) A period of epidermization, and
- d) A cicatricial stage.

Stages (b) and (c) can be termed "the period of closure of the granulating area," and, as such, can be subdivided into a period of rapid and a period of slow decrease in the granulating area. These two phases are due to contraction and epithelialization. They are not separate in time from each other and occur *pari passu*. The rate of epithelialization increases with time and contraction slows with time. Perhaps it would be well here to differentiate between contraction and contracture. Contraction is a diminution in size of a wound and contracture or cicatrization, the diminution in size of a scar.

The nature of the force causing contraction is not known, but it is felt to originate from granulation tissue in the raw wound. How it does this is a mystery. However, it does occur and to such an extent that the surrounding skin is first thinned out as it is stretched, but after a delay of three weeks or so, begins to thicken and return to its previous dimensions.

The histological changes during wound healing are described most easily by again subdividing the process into four periods:

- a) To provide immediate protection of the cut surface;
- b) The phase of garbage removal;
- c) The phase of repair, and
- d) The phase of remodeling.

Together, periods (a) and (b) make up the so-called latent period during which there is negligible increase in wound tensile strength."

"The concept of wound strength in later stages of wound healing is also changing. Until recently, it was felt there was a strict linear relationship between wound tensile strength and collagen content. There is indeed a remarkable relationship between these two factors. That others are involved, however, is shown, at least by the fact that a wound has sufficient strength for sutures to be removed and the patient discharged by six to seven days postoperatively, at the time when collagen production is only just getting underway. Also, in the study of secondarily sutured wounds, the extreme, rapid gain in tensile strength during the first three days after a procedure is accompanied not by a rise in wound collagen but by an actual fall in wound collagen. Inevitably, therefore, the ground substance has been implicated in imparting tensile strength to a wound."

"As mentioned earlier, there has been a long search for the means to improve the strength of a wound. This has produced a great volume of literature with a chronic negativity. Many substances have been added to wounds to accelerate their healing and these include:

- 1. Tissue extracts;
- 2. Vitamins and hormones;
- 3. Colchicine;
- 4. Glutathione;
- 5. Red blood cells;
- 6. Cod liver oil and sesame oil, and
- 7. Detergents.

All have apparently reasonable explanations as to why they should be tried but none have been shown to be of any value."

A recent article being widely discussed is "Injuries to Knee Ligaments—Relationship to Looseness and Tightness in Football Players" by James A. Nicholas, M.D., Team Physician, New

York Jets, appearing in the *Journal of the American Medical Association*, Volume 212, Number 13, June 29, 1970.

Subjecting the New York Jet team members, from 1963 to 1968, to five tests to determine relative body looseness or tightness, Dr. Nicholas found that as players exhibited more of the loose characteristics determined by the tests, the incidence of ligament rupture increased.

The five tests are, 1) touching palms on floor with knees fully extended; 2) the presence of 20° or more of recurvatum; 3) demonstrating a heel-to-heel 180° angle with the hips and knees externally rotated and knee flexed between 15° and 30°; 4) demonstrating the ability to assume the 'lotus position' on the floor with knees or ankles parallel to the floor; and 5) upper extremity laxity demonstrated by measuring shoulder flexion, elbow hyperextension and hypersupination of the forearm. Only those players with subsequent third degree ruptures were included in the injury statistics.

Dr. Nicholas concluded, "... independent of many other factors responsible for injury in football, an increased likelihood of ligamentous rupture of the knee occurred in loose jointed football players and of muscle tears in tight jointed football players."

Reprints can be obtained from Dr. Nicholas, 150 E. 77th Street, New York City, New York, 10021.

These five tests are undoubtedly in for many trials by trainers and doctors across the country. How informative it would be to pool the statistics gathered by each trainer who attempts his own investigation in the same manner as did Dr. Nicholas. Now that the NCAA allows a physical examination to be given by a physician to a prospective student-athlete at the time of his visit to the campus to determine his medical qualifications to participate in intercollegiate athletics, (NCAA Bylaws Interpretations, page 61, Article 6, Section 3), a series of tests, perhaps including the five used by Dr. Nicholas, could be very beneficial to trainer, doctor and coach.

• • •

An innovative and different approach to dealing with possible injury prediction and/or prevention is found in "Psychosocial Variables That Influence Attitudes Toward Injury," presented by Bruce Ogilvie, PhD, San Jose State College, at the American Academy of Orthopaedic Surgeons Meetings, "The Knee in Sports," San Francisco, California, August 3, 1970.

With psychological investigation of patient attitudes towards injury which influence both inci-

dence of, and recovery rates of injury being relatively sparse Dr. Ogilvie states, "it becomes essential that in order to extend our objectivity as to the motivational bases of attitudes toward injury, it will become necessary to measure reliably as many of the following individual differences as possible:

- 1) love of sport
- 2) physical pain threshold
- 3) degree to which athletic participation is an overcompensatory activity
- 4) ego fulfillment nature of sports
- 5) degree to which athletic participation is a personal choice
- 6) past experience in terms of injury and injury recovery
- 7) risk taking potential of the individual
- 8) reaction to failure or personal limitation
- 9) stress seeking propensity of the individual
- 10) degree to which self-confidence is altered by injury
- 11) basic temperamental predisposition.

Using the Athletic Motivation Inventory (AMI), a questionnaire of 190 items, and interpreting resulting trends (i.e., lowering of self-confidence, reduction in emotional control, increased guilt proneness and a reduction in mental toughness), the following clinical observations might be anticipated:

- 1) an excessive need for medical reassurance
- 2) dramatic shift in self-confidence
- 3) social withdrawal
- 4) increased dependency needs
- 5) transfer of symptoms
- 6) professed physical limitation in the face of full recovery
- 7) seeking to place full responsibility with the medical consultant for discontinuing participation.

Dr. Ogilvie states that the total approach to medical treatment should take into consideration those aspects of an individual which may contribute to psychosocial maladjustment consequently altering an outlook or even a response to treatment.

We all see symptoms described by Dr. Ogilvie in the athletes we deal with but perhaps are not aware of the possible connections that the injured athlete may present psychologically related to the cause of injury and recovery time as described by Dr. Ogilvie.

• • •

A recent arrival on the publication scene is *Athletic Taping and Bandaging* by Ernie Biggs, Ohio State University, Columbus, Ohio.

The unique style of presentation coupled

with the reputation of the author brings this particular publication to light in a dynamic way. With the illustrated booklet in hand, one listens to the narration and description of the methods of application for strapping most parts of the body. The listener has a capsule taping course which can be used in a teaching situation (i.e. overhead projection and cassette tape accompaniment) or as a reference for those not familiar with the strapping procedures for certain body parts.

Booklet illustration is excellent with numbered pictures and numbered tape strips in each picture. For the sake of clarity, more voice referral to the numbered tape strips in each picture sequence may be more desirable in the first part of the lecture, as is done to a greater degree in the latter part. For a high school or junior high coach, breaking down some of the more difficult strappings with more pictures may be advantageous.

With some time left at the end of the tape, one is reminded that during the course of the narration more 'theory and reasoning' for particular strappings would be beneficial to the listener. The whys of many strappings greatly interest those who have strapping procedures of their own, but may differ from those presented in some respects. We are all taping feet, ankle, knees, elbows, etc., and the present diversification in strapping procedures can be clarified somewhat more clearly by available athletic training texts and vehicles such as *Athletic Taping and Bandaging Techniques* when they attempt to give reason for particular strapping procedures.

A list of twenty basic principles of taping and bandaging is presented at the end of the tape. Some of these principles are referred to during the course of the tape and are again listed at the end. A few might well have been mentioned at the beginning, i.e., reasons for using tape, shaving hair, applying tape adherent, removing tape, etc., to prepare the novice with some principles of strapping.

Completeness in a small package is a selling point for this publication. Professional stubbornness may intervene but anyone not familiar with Ernie Biggs' style of strapping would benefit from the package.

The illustrated booklet and tape cassette sell for \$15, through Vimar, Inc., 145-C East Livingston, Columbus, Ohio 43215.—C.B.T.

Ed. Note

While a diversity of subjects will be the goal, success in this vein can be greatly aided by re-

questing abstracts of articles pertinent to athletic training but of special interest to you—the individual reader. Perhaps you feel that you have read an article that warrants passing on to the organization as a whole. Pass on that information to me in the form of an abstract for dissemination to the membership through these pages. Our interests within athletic training do differ and the Journal should have something for everyone. Individual reactions to the content of this section are welcomed; in fact, invited. There is hesitancy in the general membership with respect to the type of reaction needed to further changes for the improvement of the organization. Perhaps it is felt that your opinion will be lost in the multitude. Take a little time and react.

Five article abstracts, one lecture, and one book review have been presented in this issue and hopefully, at least one has been of interest to you. An attempt to review all the latest publications of interest to the profession is the goal and a back log of material would be a most welcome sight.

In closing, we are reminded of the motto of the University of Tennessee Medical School Continuing Education Service—"He who graduated yesterday and stops learning today, is uneducated tomorrow."

Address all communications regarding "Athletic Training in the Literature" to, Assistant Editor, Clinton Thompson, Department of Athletics, Colorado State University, Fort Collins, Colo. 80521.

STATEMENT OF OWNERSHIP

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Athletic Training in the News

From St. Louis, Jack Rockwell reports that Bob Bauman, a long-time member of the NATA and speaker at several of our conventions will no longer travel with the St. Louis Baseball Cardinals. He will continue to be the "top man" of the Cardinal's training staff, but will operate from the "home base" only. His assistant will do all of the traveling. On September 23 the Cardinals held a private Bob Bauman party with 50 invited guests. It was at this reception that his new plans were announced. Hope to see him at Baltimore in June.

• • •

From the September 6, 1970 issue of the Columbus, Ohio, *Sunday Dispatch* came the following column:

"Football Accidents Need Not Devastate—Your Insurance Advisor," by Saul Solol, CLU. Question: "We're interested in providing accident insurance for our high school football team. Can you tell us something about the coverages available and, also, give us an idea as to the cost for this insurance?"

Answer: Playing football can sometimes lead to serious injury and the resulting high medical costs can financially prostrate the injured person or his parents. One way to handle this problem is through a football team accident insurance plan which offers protection against injuries and costly medical expenses.

A typical football team insurance plan would pay for: a) Treatment by a legally qualified physician or surgeon. b) Confinement in a hospital and other necessary miscellaneous medical costs. c) Treatment of injury to natural teeth up to \$100.

There would be no limit to the number of accidents covered, either per athlete or team. The plans pay full benefits up to \$500—or \$5,000 if you select the latter amount. There would be a deductible applying to the first dollar losses. The cost of the insurance is predicated upon the benefits you select and the applicable deductible.

Here are some typical rates for this coverage:

For \$500 of benefits with a \$25 deductible, the cost would be \$24 per man. For \$5,000 of benefits with a \$25 deductible, the cost would be \$26.90 (only \$2.90 more per man for \$4,500 more coverage!). A less expensive plan is one that pays \$5,000 with a \$250 deductible; it would cost only \$6.95 per man. Another plan has a \$500 deductible and its cost would be only \$3.05.

The latter two plans are worthwhile if the school already has some type of accident coverage for its students, or if the students are covered under their parents' hospital plans.

An additional benefit is available which is accidental death and dismemberment. The plan would pay \$5,000 in event of accidental death and up to \$5,000 in event of dismemberment. If the player loses both hands, or both feet or sight of both eyes, the plan would pay \$5,000. It would pay \$3,750 for loss of one arm or one leg and \$2,500 for loss of one hand or one foot or loss of sight in one eye. The extra cost of death and dismemberment is only \$1.45 per man."

This is an interesting and informative article, but it brings to mind an interesting question. Shouldn't the school with the qualified athletic trainer deserve consideration for lower insurance rates than those schools in the great majority which have either actually or virtually no trainer?

• • •

Worth Reading: The American Medical Association's popular publication *Today's Health* has presented a couple of pertinent articles this past Fall. If you can obtain the issues, here is what to look for:

"Should Johnny Play Ball?" By Ralph Bugg; *Today's Health*, September, 1970, page 56. Surely the average trainer has been asked repeatedly, "Should my son play . . . football, Little League Baseball, etc.???" Here are a few answers by authorities like Dr. Fred Allman and others.

"High School Sports Flunk the Saliva Test," by Theodore Irwin; *Today's Health* October,

1970, page 44. Drugs and the high school athlete. Quotes by Dr. Daniel Hanley of Bowdoin College, Dr. Robert Murphy of Ohio State University and others: Should be on the current reading list of all trainer, high school and college.

• • •

Something to Ponder: From *Medicine in Sports* 10:2; July, 1970. Alexius Rachun, MD comments on the progress of sports medicine 1965-1970: "Sports medicine made its biggest contribution in the past five years when, through group action and lay participation, it clearly delineated a set of rules for the prevention of serious, occasionally fatal, heat problems in the athlete. Breaking the tradition among coaches of withholding fluids for athletes in hot, humid weather was, in itself, a major achievement. It would be most desirable if the same influences were brought to bear to put an end to the practice of spearing in football, a major cause of head and neck injuries.

• • •

Football-Linked Deaths Found To Have Decreased 36% In '69. From the *Hospital Tribune* Monday, September 21, 1970.

Chapel Hill, N.C.—The number of deaths directly related to football decreased 36 per cent during the 1969 season, according to the 38th annual Survey of Football Fatalities in the United States.

The 23 direct fatalities consisted of 18 in high school, three in sandlot, and one each in professional and college football. In the 1968 season there were 36 such deaths—26 in high school, four in sandlot, five in college, and one in professional football.

The survey noted, however, that there was a 25 per cent increase last season in the number of football fatalities associated with such indirect causes as heart and circulatory accidents, infections, and heat stroke. During the 1968 season there were 12 such indirect fatalities; last season the number was 15.

The survey was prepared for the American Football Coaches Association, the National Collegiate Athletic Association, and the National Federation of State High School Athletic Associations. It was conducted by Carl S. Blyth, Ph.D., of the University of North Carolina, who is chairman of the committee on football injuries of the A.F.C.A. and chairman of the committee on competitive safeguards and medical aspects of sports of the N.C.A.A. Dr. Blyth prepared the report on college, professional, and sandlot football, and David C. Arnold of Chicago, of the

N.F.S.H.S.A.A., compiled the data on high school football.

Since 1960, the survey pointed out, most of the direct fatalities have been caused by head and neck injuries. Last season, of the 23 direct fatalities, 19, or 84 per cent, resulted from such injuries. The investigators, therefore, urged proper conditioning exercises to strengthen the neck, condemned the practice of "spearing" and called for strict enforcement of rules prohibiting this practice.

FATALITIES "VERY LOW"

The survey noted that the incidence of direct fatalities "is very low" on the basis of exposure per 100,000 players. For the 1969 season the rate was 1.61 for high schools and colleges combined—19 fatalities among 1,175,000 players (1,100,000 high school plus 75,000 college players).

Reviewing the cumulative figures on direct fatalities since 1931, when the annual survey began, the authors found that more than 47 per cent occurred during regular scheduled games and more than 21 per cent in sandlot games and that tackling was responsible for nearly 32 per cent, "tackled or blocked carrying the ball" for 16 per cent. Since 1941, defensive players sustained slightly more direct fatal injuries than offensive players.

A tabulation by anatomic location showed that since 1947 the head and face area accounted for 67 per cent of the direct fatal injuries, the spine for 17 per cent, and abdominal-internal injuries for 16 per cent.

Since 1931, it was noted, fatal injuries indirectly associated with the game represented approximately one-third of all football fatalities. A majority of them resulted from heart and circulatory accidents (32 per cent) and infection (26 per cent).

During the 1969 season five of the 15 indirect fatalities resulted from heat stroke. The authors urged, therefore, that "all coaches, trainers, and physicians continue their efforts toward eliminating athletic fatalities which result from physical activity in hot weather."

Other recommendations, which are similar to those put forth in the previous survey, included:

—A mandatory medical examination and medical history taken at the beginning of each season.

—Attendance of a physician at all games and practice sessions.

—Strict reinforcement of game rules.

—Continued research on safety factors in football."—L.P.

The Rational Use of Thirst-Quenching Solutions in Athletics

(Continued from page 7)

about one week. During this adaptation period, a powerful "salt(NaCl) saving" mechanism comes into play and the body begins to conserve sodium and excrete more and more potassium. Some potassium is excreted for each unit of sodium conserved. Therefore, as adaptation continues, it becomes increasingly important to replace potassium! During exercise most fluid loss occurs through sweat (water, sodium, potassium, and chloride) and water vapor from our lungs. Therefore, a good general rule is to make sodium, chloride, potassium, and water available in our drink. The sodium and potassium are of course, in the form of ionized salts, like chlorides, lactates, phosphate, etc.

We know that water is absorbed into the circulation from the stomach much faster if it is accompanied by electrolytes or glucose. This fact, plus the available carbohydrate calories, makes glucose an acceptable addition to the water-mineral solution. More bluntly, we are now referring to a dilute, sweetened, sweat solution! To make this concoction delectable (or even palatable) some form of flavoring must be added. The citrus family of flavors does the best job in this respect.

CALENDAR

1. December 5; The Fourth Annual Medical Aspects of Sports Seminar, Catonsville Community College, Baltimore, Maryland. Information: Ramsay B. Thomas, M.D., Chairman, Medical Aspects of Sports Subcommittee, Medical and Chirurgical Faculty of State of Maryland, 1211 Cathedral Street, Baltimore, Maryland 21201.

2. February 13, 1971; Fourth Annual Symposium on the Medical Aspects of Sports, Americana Hotel, New York City. Information: Richard Klemfuss, Medical Society of the State of New York, 750 Third Avenue, New York, New York 10017.

3. March 26, 27, 1971; Sixth Postgraduate Teaching Days in Sports Medicine, The Wisconsin Center, Madison, Wisconsin. INFORMATION: Coordinator of Postgraduate Medical Education, University of Wisconsin Medical Center, 307 North Charter Street, Madison, Wisconsin 53715.

Coloring and cooling also increase acceptance. The use of vitamins seems, to me, to be without physiological justification.

SUMMARY

1) The athlete's initial physical examination should include a complete urinalysis and other kidney function test(s) as may be directed by the team physician. The objective is to insure that only those athletes with normal kidney function use the multiple electrolyte replacement solution. Those with abnormal kidney function should have their fluid replacement routines individually tailored by the team physician.

2) The athlete should be permitted to drink cool, palatable and dilute solutions of water, salt, potassium and sugar . . . at regular breaks during both practice and participation. These solutions can be obtained commercially in liquid, powder or concentrated form. Some institutions have developed their own multiple electrolyte beverages and compound all their own solutions.

3) The indiscriminate use of plain salt tablets should be discontinued. Supplemental potassium as well as sodium should be made available to everyone exposed to heat stress.

4) The multiple electrolyte solutions are also useful in treating dehydration syndromes. For example, the vomiting and diarrhea which often accompany the ingestion of 'strange' food or water, or the "nervous trots," (both common occurrences in athletic teams).

This presentation, while perhaps over-simplified and short on detail, is nevertheless accurate and practical. The interested reader should find ample scientific and experimental information in the publications listed below, or in their very complete bibliographies.

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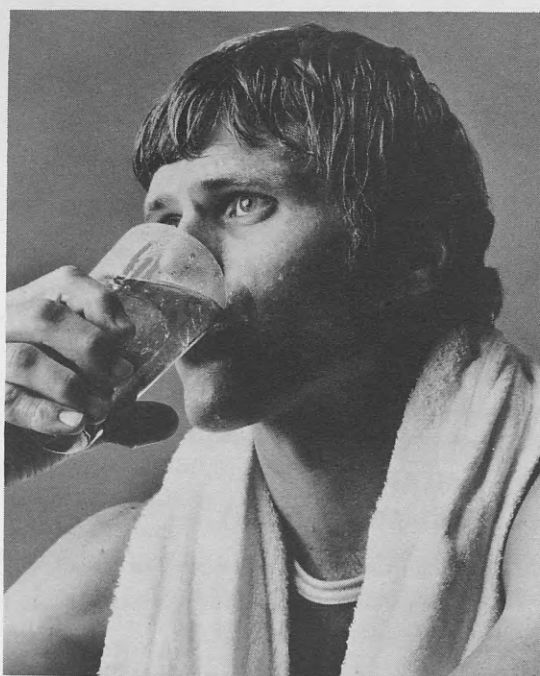
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1. All manuscripts should be typewritten on one side of 8½ x 11 inch typing paper, double-spaced throughout.

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

3. When references are made to other published works, the list of references should be in the following order: a) books: author, title, publisher with city and state of publication, year, page; b) articles; family names and initials of all authors, title of article, either the full journal title or the title as abbreviated in the latest edition of *List of Journals Indexed in Index Medicus*, volume, inclusive pages, date.

4. It is the understanding of *The Journal* editors that manuscripts submitted will not have been published previously; and that the author accepts responsibility for any major corrections or alterations of the manuscript.

5. It is requested that each submitting author include with the manuscript a brief biographical sketch of himself.

6. If reprints are desired, request should be made at time of manuscript submission. Each author will bear the cost of his own reprints.

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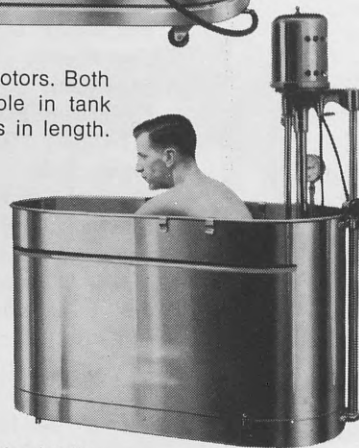
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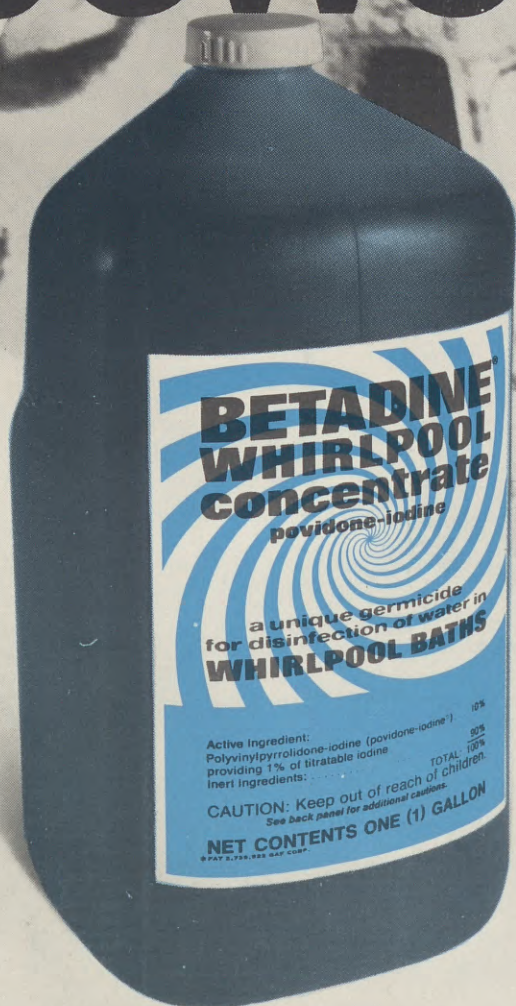
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