ATHLETIC TRAINING

THE JOURNAL OF THE
NATIONAL
ATHLETIC TRAINERS
ASSOCIATION

VOLUME 7
NUMBER 2
APRIL 1972

IN THIS ISSUE:

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THE JOURNAL OF THE NATIONAL ATHLETIC TRAINERS ASSOCIATION

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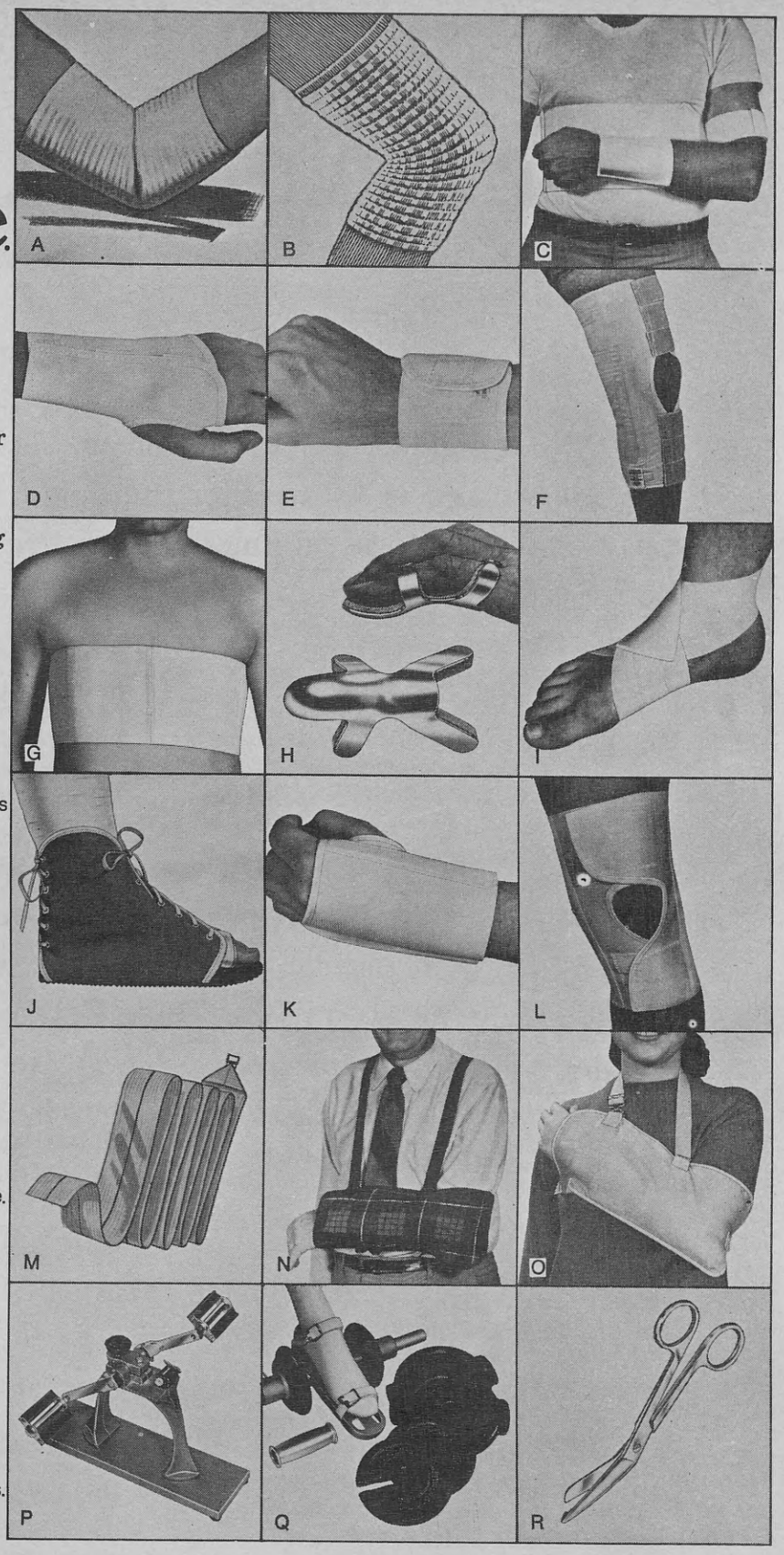

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Nineteen centuries have come and gone, and today He is the central figure of the human race and the leader of the column of progress. I am far within the mark when I say that all the armies that ever marched, and all the navies that ever sailed, and all the parliaments that ever sat, and all the kings that ever reigned, put together, have not affected the life of man upon this earth as has that One Solitary Life.

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Athletic Dermatology—Second of a Series

Hypersensitivity Reactions in the Skin of Interest to Trainers

by Roy L. Kile, M.D.

Cincinnati, Ohio

Recently there has been considerable talk about para-medical personnel. For many years trainers of athletic teams have been part of such a group without much attention. The trainer fits between the physician and coach and acts as his representative on the field. If a player is not in good health, he is of no value and useless to a team. It behooves coaches and owners to select competent physicians and then strictly abide by their orders. The better ones have always done this. It has been my experience that successful coaches work closely with their physicians and heed their advice.

TYPES OF REACTIONS

So-called allergic reactions of the skin can roughly be divided into three types. These are: (1) Contact dermatitis, or sensitivity from materials externally applied to the skin, (2) Atopic dermatitis, which is an inherited type of sensitivity that is internal in origin and is found in the same individuals that have hayfever, asthma and so forth, and (3) Drug eruptions—reactions to drugs given internally by either injection or ingestion. There is some overlapping between one type of reaction and another, and at times it is difficult to distinguish between them. One must also distinguish between a contact dermatitis or externally produced eruptions from drugs and those produced by the same drugs given internally. Externally applied preparations produce a different type reaction than when given internally. Hives from penicillin is a good example of the latter.

CONTACT DERMATITIS

By far, the commonest reaction seen by trainers will be contact dermatitis. This is a sensitivity reaction to one of many thousands of different chemicals. The commonest of all is poison ivy. Generally, plant eruptions of this type are referred to by the skin specialist as *dermatitis venenata.* As is well known, the sweating and redness that occur in the skin of athletes form a very favorable soil for development of these sensitizing reactions. About two-thirds of all people when exposed to poison ivy will develop the eruption. Poison oak and poison ivy may be variants of the same plant. Poison oak does not occur in the Midwest of the United States and is found only in certain sections of the Pacific Coast and Atlantic Seaboard. Many skin eruptions from plants are called poison ivy when they come from some other plant but look exactly the same. The subject in and of itself is large enough to involve the entire article. It suffices to say that players can get poison ivy by direct or indirect contact such as through clothing, animals and so forth. The author had the experience of one college football team, during spring practice, developing severe poison ivy eruptions in several of its members. One of them was very extensively involved. On investigation it was found that the weeds surrounding the practice field contained much poison ivy. Bare-legged football players ran into retrieve the football and soon contacted the plant. A good trainer would notice this and eradicate the poison ivy as the season started. This seems to be a very simple thing; however, I recently saw one of the star players of a college team miss an important game because of an extensive poison ivy contacted under the same conditions.

As has been mentioned, contact dermatitis can come from many other chemicals. Dyes in leather, as well as clothing, can cause reactions in certain susceptible individuals. I have seen a reaction from the headgear used by football players with an eruption across the forehead as well as another

with a reaction to the chin strap. Actually, these are rather easy to diagnose and correct. One of the commonest type of reactions comes from various locally applied chemicals. In an effort to try to cure fungus infections of the feet and groin many chemicals are applied to the skin that often produce reactions. We like to distinguish between true sensitivity reactions and direct chemical irritation. By the latter is meant a reaction on anyone who uses the chemical in a similar manner and sensitivity is not involved. Both can be very damaging. Powders and ointments containing antibiotics can occasionally cause this type of reaction. Antiseptics of various sorts will do it occasionally. I believe the present day trainer will use nothing but the blandest of preparations until his physician approves their use or a competent dermatologist guides them in this regard. Much time and suffering could be saved with care in selecting drying powders, antifungal preparations and chemicals used for infections. Of course, these reactions can occur under anyone's supervision but experience causes caution and a decrease in their number.

With all the paraphernalia worn by infielders on a big league baseball team it is a wonder most of their groins are not involved in skin eruptions. This added to the use of wool clothing produces considerable sweating and a very favorable media for irritation as well as fungus infections. Bland, drying powders that take up moisture are of value in these areas, provided irritating chemicals are not incorporated in them. If such irritation begins, it is imperative that the trainer not try to treat it but rather to have the physician see it as early as possible in order to prevent more severe reactions. The author has seen several big league baseball players with severe oozing eruptions in the groin that strongly resembled the backsides of some of the baboons at the zoo. As we all know, the loss of one or two men can be catastrophic in an important game or "drive for the penant."

A good general principle to follow, if in doubts as to what to put on and the trainer is the only one available to take care of the situation, is to use something that is very bland and soothing rather than try to destroy any type of infection at all.

ATOPIC DERMATITIS AND URTICARIA (HIVES)

This type of reaction is internal in origin and may come from many causes. These individuals have an inherent background that makes them susceptible to this type of reaction. They do not necessarily develop contact dermatitis more than other individuals although there may be a little predisposition in this regard. One of the commonest causes of hives is the ingestion of drugs. This will be taken up more in detail a little later, but it is one manifestation of sensitivity inside the body. It shows itself by this type of reaction in the skin.

Another type of reaction is from various foods. This is not a toxic or poisonous reaction but rather a true sensitivity to certain chemicals taken into body to which the body reacts in this manner. For the most part, trainers are not involved in this type of food problem only as an indirect effect. It is interesting that hives can probably also come from psychotic reasons. In a few cases, certain "nervous upsets" can produce a generalized itching eruption. Individuals who have come along as far as being professional athletes are pretty much aware of their problem. A few common reactions are, for instance, the professional golfer who breaks out in hives when he inhales fertilizer that is used on the golf course, which is sometimes, in turn, mixed with various fungicides to destroy fungi in the turf. Another may be the athlete who develops hayfever during the fall season when ragweed is pollinating and becomes quite a problem in his work. Lastly, there are those who develop hives from exposure to the sun and heat. This type of solar urticaria can be catastrophic to the tennis player or other athlete of this type. In jest, it has been noted that big league baseball players don't have this worry as practically all their games are now played at night! The modern day professional baseball player hardly gets sunburned except during spring training and in Chicago!

DRUG REACTIONS

Another fairly common type of reaction that is a sensitivity on the skin is that to various drugs. Probably the commonest example is penicillin. In this instance, a reaction of hives and sometimes joint symptoms occurs about ten days or two weeks after the drug is given. All of these drugs, including penicillin, are very valuable and this is one of the risks that a physician takes in giving them. He must weigh in the balance in making the decision when to give what drug. Sometimes it is very hard to decide.

The author has seen a big league baseball player several years ago whose team was on the road and who injured his leg sliding into base. The trainer gave him two injections of penicillin because of the infection that occurred. About a week or ten days later this shortstop developed a violent generalized reaction while in our city. He was hospitalized for a period of about a week having this condition treated. Not only was he

lost to the team, but they were long since gone to another city before he got out of the hospital. While the same type of reaction could have occurred had the drug been given by a physician, it is felt that it would have been much better to have had a physician order such a drug if at all possible. It is realized that some physicians will give "standing orders" allowing the trainer to do these things as he sees fit and it may at times be necessary to do so. Other antibiotics beside penicillin can produce reactions too. The incidence, however, is much less with their use.

Another very interesting type of reaction is the so-called photoallergy. In this instance the ingestion or injection of a drug produces no reaction. The exposure to sunlight produces little or no reaction, however, when the combination is employed, then a violent reaction occurs. In other words, if a person is taking a given drug, then gets out and exposes himself to the sun, a marked reaction will occur in the sun-exposed areas. The drug seems to sensitize the skin to the sunlight. These agents are called photosensitizing agents and are becoming more and more common in our practice. For a good part of the United States, one doesn't have to worry about this in the wintertime, but in the summertime and in outdoor sports it can become a factor. Some drugs like tranquilizers, anti-diabetic drugs and even diuretics or water pills can cause this type of sensitization. It is a very interesting phenomena about which a lot more is being learned.

The third type of drug reaction can come from a "cortisone" type drug. We doctors refer to them as steroids. Some of these may be sensitivity reactions but such it quite rare. However, reactions to these chemicals are not rare in the sense that they produce change in the body that can be disturbing. Steroids are being used very extensively by injection and ingestion. They are used in the treatment of many skin diseases as well as by orthopedic men and so forth. They can cause the body to retain fluid and the patient swells, as well as many other type reactions. People who get very many steroids can also have their resistance to infection lowered.

There are many other types of reactions that don't fall in the range of hypersensitivity reactions but are peculiar reactions to the skin. I think of the scratching on the arms and legs that comes from Astro-Turf and synthetic turf in general. There are the peculiar infections that occur on the back of the neck from headgear of various sorts as well as irritation and rubbing from various types of protective devices athletes wear. If they are not irritated by chemicals that I have emphasized so forcibly above, they don't cause too much trouble and soon the body overcomes them by developing a resistance or thickening of the skin at the involved sites.

In conclusion we can readily see the importance of these sensitizing reactions in athletes. While many reactions cannot be foretold by anyone, some of them can be prevented by judicious use of drugs. A careful history by the team physician of allergies in the past, and the use of chemicals in drugs that are known by experience to produce a minimum of reactions, will help limit their frequency. It is the smart coach and trainer who follow and listen to the physician. The author can well remember a talk given to several hundred coaches in this area. Within 24 hours one coach, who has had the most successful high school team for many years, was after me for a copy of the talk I had given. He wanted all the information contained therein to transmit to his trainer as well as for his own information and that of his assistants. Most of the other coaches listened but that was the limit of their interest. The successful man, however, pursued these things as extensively as he could. It is this thoroughness that produces successful and winning teams.

Strength, The Common Variable in Hamstring Strain

by Carl S. Christensen, Ph.D.[1] and Douglas C. Wiseman, P.E.D.[2]

The fact that hamstring strains are disabling and account for extended losses in participation time is understood by speed athletes, coaches, and trainers alike. Ex post facto treatment is successful only to a point. The injured athlete often is plagued by recurrent strains following premature reentry to strenuous practice sessions and competition. For these reasons, knowledge related to hamstring strain prevention is of importance.

The etiology of hamstring strain has been variously attributed to: improper warm-up, overuse or overstress, lack of coordination between opposing muscles, abnormal muscle contraction, improper conditioning, improper skill pattern, over stretch, strength imbalance between agonist and antagonist, force-velocity relationships, mineral (magnesium) imbalance, and local fatigue. It is quite possible that each one or a combination of the above factors contribute to hamstring strains. Each theory suggests an imposed stress or load which is beyond the strength tolerance of the muscle.

O'Donoghue (1)[3] has stated that "the strain will occur at the weakest link of the muscle-tendon unit at a given time." The time or point in the leg stride cycle at which a weak link will most likely collapse is during the position of greatest stress. Biomechanical analyses of the running stride (2) and the walking stride (3) have indicated that the hamstrings exerted greatest force and were under greatest stretch stress near the end of the forward swing phase just prior to the beginning of the stance phase. Stress occurs near the end of the swing phase when the biarticular hamstring group experience simultaneous stretch from both ends due to flexion at the hip and extension at the knee. Further stress may be created at this point as the hamstring group contracts to prevent knee hyperextension and to counteract the momentum of the forward leg swing. At the beginning of the stance phase, with the foot anchored on the ground, the hamstrings actively contract to assist the quadriceps in stabilizing the knee in a slightly flexed position and ultimately in the extension of the thigh at the hip and, paradoxically, at the knee. In the "pull" runner this contractile stress in the hamstrings will be multiplied as the athlete attempts to pull his center of gravity over his foot base. If, in fact, the late swing phase, early stance phase and the late stance phase are the points of stress during the stride cycle, then strength measures should be focused within the range of the 120-180 degree knee angles found during these phases of the stride cycle.

Klaffs and Arnheim (4) have indicated that hamstring strain was a result of abnormal muscular contraction. Further, they stated that the abnormal contraction may be due to an "imbalance between agonist and antagonist muscle strength." Recent research by Burkett (5) supported this strength imbalance theory. His investigation of track sprinters and football players indicated a significant relationship between knee flexion-extension strength and hamstring strain. However, he failed to consider strength differences at various knee angles.

In view of the logic supporting a strength imbalance theory to explain hamstring strain, it became the hypothesis of this investigation that track team sprinters, long jumpers, and hurdlers who had atypically low knee flexion-extension strength ratios, measured at knee angles of 120-150 degrees, were predictably subject to hamstring strains.

PROCEDURES

All members of the Varsity Track Team at Northeastern University who were training to compete in either sprints, hurdles, and/or the running long jump were eligible to take part in the experiment. Nine athletes volunteered to

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[2]Department of Physical Education, Plymouth State College, Plymouth, N.H. 03264.

[3]Numbers in parentheses designate References at the end of the paper.

Standard Deviations, Critical X Values, In- Sprint, Hurdle, and/or Running Long Jump

Leg Ratio 150	Injuries Predicted	Injuries Received
0.88	X	
1.13	X	X
1.11	X	
1.21		
0.71	X	X
1.25		
1.04		
0.88		
0.72	X	
0.99		
0.19		
0.80		

and extension were determined for each limb of each subject at the two angles tested. The distribution of the flexion-extension ratios provided the bases for the statistical analysis. Using a "t" test with eight degrees of freedom, athletes having ratios below the mean at an 0.01 significance level at either 120 or 150 degrees for either limb were classified as being subject to hamstring strain. (One-tailed test, 8 df, 0.01 1oc = 2.896.)

RESULTS AND DISCUSSION

It will be seen upon examination of Table 1 that five athletes fell below the critical score (X) value indicating that they were the persons considered to be predictable candidates for hamstring strain. Of these five individuals, two (40%) did receive a left hamstring strain. One of the two athletes had received a slight hamstring strain in his left leg which required two days absence from practice during the Spring 1970. The other athlete had no history of hamstring strain. Both of the athletes incurred injury during the 1971 track season after their strength ratios had been assessed. It will be noted that none of the athletes who scored above the critical X value in all tests incurred hamstring injury.

Hill (6) and Watanabe (7) have each suggested that knee extension in the forward swing phase of speed running produces hazardous stretch to the three biarticular muscles of the hamstring group. This results from simultaneous hip flexion and knee extension. The resultant stretch produces a stress greater than the strength of the unit and something must give. The biomechanical logic of this theory appears to be tenable. However, to alter the running pattern of the athlete as suggested by Jones (8) is not reasonable. An alterna-

Strength, T
Variable in H

by Carl S. Christensen, Ph.D.[1]

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Table 1 Leg Flexion-Extension Ratios, Means, Standard Deviations, Critical X Values, Injuries Predicted, and Injuries Received for Nine Sprint, Hurdle, and/or Running Long Jump Athletes

Subject	Right Leg Ratio 120	Right Leg Ratio 150	Left Leg Ratio 120	Left Leg Ratio 150	Injuries Predicted	Injuries Received
a	0.43	*0.81*	0.52	0.88	X	
b	*0.26*	1.43	*0.39*	1.13	X	X
c	0.52	*0.88*	0.43	1.11	X	
d	0.51	1.17	0.46	1.21		
e	0.62	1.16	0.48	*0.71*	X	X
f	0.53	1.32	0.46	1.25		
g	0.61	0.92	0.46	1.04		
h	0.55	0.93	0.52	0.88		
i	*0.33*	1.30	*0.34*	*0.72*	X	
Mean	0.48	1.10	0.45	0.99		
S.D.	0.12	0.21	0.05	0.19		
Critical X @ alpha .01	0.36	0.89	0.40	0.80		

participate and were tested for right and left leg knee flexion-extension strength prior to the beginning of the competitive winter season of 1970-71.

As each subject reported for testing, he was submitted to static stretch leg warm-ups in flexion and extension. At the same time, background formation was procured with regard to his injury history. (Four had strained a hamstring during a previous season.) The subject's flexibility (hip on thighs) was then measured through the use of a Leighton Flexometer. (Each had a flexibility range of at least 75 degrees.)

A cable tensiometer was used to assess static strength of knee flexion and extension. The cable strap was affixed at a point one-half the distance between the lateral epicondyle and the lateral malleolus on the limb being tested. While specific testing procedures were explained, a practice trial was administered. The sequence of knee angles (120 and 150 degrees) to be tested was selected at random and in advance. Two flexion and extension strength trials were administered at knee angles of 120 and 150 degrees for both the right and left legs. The torso-thigh angle was 180 degrees for the leg flexion test with the subject in a prone lying position and 90 degrees for the leg extension test with the subject in a sitting position.

At the conclusion of the testing session, each subject was dismissed and asked to advise the investigators if, and as soon as, he received a hamstring strain (as defined by the team physician) during the competitive season.

Tensiometer scores recorded from the strength tests were converted to pounds. The highest highest score at each angle of leg flexion and extension was identified. Ratios between flexion and extension were determined for each limb of each subject at the two angles tested. The distribution of the flexion-extension ratios provided the bases for the statistical analysis. Using a "t" test with eight degrees of freedom, athletes having ratios below the mean at an 0.01 significance level at either 120 or 150 degrees for either limb were classified as being subject to hamstring strain. (One-tailed test, 8 df, 0.01 1oc = 2.896.)

RESULTS AND DISCUSSION

It will be seen upon examination of Table 1 that five athletes fell below the critical score (X) value indicating that they were the persons considered to be predictable candidates for hamstring strain. Of these five individuals, two (40%) did receive a left hamstring strain. One of the two athletes had received a slight hamstring strain in his left leg which required two days absence from practice during the Spring 1970. The other athlete had no history of hamstring strain. Both of the athletes incurred injury during the 1971 track season after their strength ratios had been assessed. It will be noted that none of the athletes who scored above the critical X value in all tests incurred hamstring injury.

Hill (6) and Watanabe (7) have each suggested that knee extension in the forward swing phase of speed running produces hazardous stretch to the three biarticular muscles of the hamstring group. This results from simultaneous hip flexion and knee extension. The resultant stretch produces a stress greater than the strength of the unit and something must give. The biomechanical logic of this theory appears to be tenable. However, to alter the running pattern of the athlete as suggested by Jones (8) is not reasonable. An alterna-

tive to changing the running pattern is to strengthen the hamstring group to withstand the stresses imposed. The purpose of conditioning is to develop the physical tolerance to withstand progressively heavier work loads, thus increasing the athletes strength, endurance and ability to withstand and avoid strain. For the athlete who strained his hamstring it is quite possible that during the conditioning process the hamstring did not receive adequate attention in order to increase its strength and endurance in phase with other muscle-tendinous units in the leg.

Klein (9) has indicated that knee flexion-extension strength differences were to be expected. He showed that hamstring strength ranged from 53 to 76% of the quadricep strength depending on the age group measured. Nine year olds had the highest strength ratio (76%) and senior high school and college freshmen had the lowest ratio (53%). In multiple angle knee flexion-extension strength tests, such as the one proposed by Bender and Kaplan (10), it is not uncommon to find athletes with flexion-extension ratios well under the percentage differences suggested earlier by Klein. These athletes undoubtedly have a lower threshold of tolerance to the various abnormal stresses ascribed as causative factors in hamstring strain injury. Mean strength ratios in the present study indicated that knee flexion-extension ratios vary with the knee angle being tested (see Table 1). At a 120-degree knee angle, the hamstring strength was 48% and 45% for the right and left limbs respectively. At a 150-degree knee angle the hamstring strength was 110% and 99% for the right and left limb respectively. To generalize, one might look for a 2:1 quadricep to hamstring strength ratio when testing at a knee angle of 120 degrees and a 1:1 ratio when testing at a knee angle of 150 degrees. Hamstring strength scores which alter the above ratios negatively, i.e., increasing the spread between quadriceps and hamstrings, should be corrected through progressive resistive exercise before the athlete is allowed to participate in stressful practice or competition.

Why these atypical strength imbalances exist in some athletes and not in others is an unknown factor, but the simplicity of measuring strength balance or imbalance between knee flexion and extension as a preventative measure makes it a useful diagnostic tool for the trainer. The few minutes invested to test each athlete may save many hours of lost participation time, assuming corrective strength development is prescribed and completed where indicated.

Although the results of this study have indicated a 40% prediction success by measuring flexion-extension strength ratios, one wonders about the remaining 60%. In an ex post facto field study of this nature it is virtually impossible to control the numerous variables in athletes and their competition. Therefore, one must look at the data presented, keeping in mind that only one variable, strength ratio, was considered. The presence and/or interaction of other variables could account for the lack of hamstring strain in the three out of five injury predicted athletes. However, one cannot overlook the fact that none of the athletes who scored above the critical X value incurred hamstring strain.

CONCLUSION

It appears evident that, within limitations of this study, there is a tendency for those having significant strength differences between the quadriceps and hamstrings to be more susceptible to hamstring strain than their counterparts. Therefore, the hypothesis of this study is deemed tenable.

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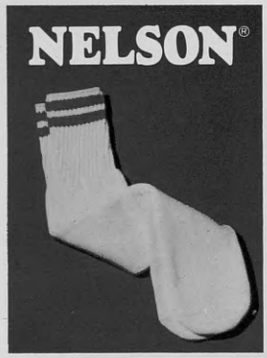

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A Review of Osgood-Schlatter's Disease Involving the Adolescent Athlete

by Lewis W. Flagg, Jr., R.P.T., R.T.[1]

The term "Osgood-Schlatter's Disease" is derived from published works of two men—Robert Bagley Osgood, a Boston orthopedist and Carl Schlatter, Zurich surgeon—but a proper terminology for the pathology is "ostechrondosis of the tuberosity of the tibia." This paper describes some of our findings and treatment.

During the course of each academic year, consisting of three seasons of required athletics, an average of 30 young males between the ages of 13 and 18 present themselves to either the trainer or a member of the medical staff with complaints of nagging, moderate pain below the patella, sometimes bilaterally. The immediate routine followed has been to provide athletic excuses from required attendance until lateral radiographs of both knees and a medical examination have been completed.

X-rays may reveal incomplete union of one or both tibial apophyses. Treatment has been that of moist heat applied in the form of hot packs or whirlpool baths to relieve discomfort, and rest from required athletics.

When symptoms have subsided, the patient has been allowed to gradually return to full activity superimposed with quadriceps exercises.

A few cases from the records of nearly 900 boys at this school each year include the following:

Without previous medical evaluation one case involved a 17-year-old male engaged in track. While taking off at the high jump, he sustained sudden pain below the right patella. He was unable to stand or extend the knee. An orthopedist found a palpable defect in the area of the anterior tibial tubercle and the left quadriceps appeared apparently unattached. A diagnosis of avulsion of the patella tendon was made and he underwent exploratory arthrotomy and open fixation with internal fixation of the right anterior tibial tubercle with metallic screws.

Another young male was seen in September, 1969, November, 1969 and September, 1970, x-rayed on all three occasions, and diagnosed as having "Osgood-Schlatter's Disease," mild tibial apophysistis with increasing generalized calcification and overlying soft tissue swelling. A prohibition upon all athletic activity was advanced by his family physician in September of 1969.

By September of 1970 he had no tenderness over the tibial apophyses and began quadriceps setting exercises from 100 - 200 times per day for seven days and was then released to an athletic program without running or jumping. One month later he was asymptomatic and began quadriceps lifting. He was gradually increased up to 25 pounds of resistance for 30 units of effort per day, then released to a full athletic program without recurrence of symptoms.

A third 17-year-old complained of "cracking" in both knees while skiing and running. Physical examination revealed a slight tenderness to palpitation over the area of the tibial apophyses. Radiographs revealed incomplete union of both tibial apophyses but with spontaneous subsidence he was released to a full athletic program.

One 16-year-old male presented the usual symptoms in November of 1970 describing "creaking and patella pain on the left." A previous examination had established a diagnosis of tibial apophysitis, but x-rays now were negative and he was released to an athletic program without further complaint.

In his two volumes on orthopedic care,[2] Sir Reginald Watson-Jones, a British orthopedist has devoted several pages to discussion of this adolescent problem including "The fact that the tibial tubercle takes the first strain of extension movement but is supported laterally by the insertion of the tendon into the tibial tuberosites explains the condition described as 'Osgood-Schlatter's

[1]Medical Department, The Phillips Exeter Academy, Exeter, New Hampshire 03833.

[2]Sir Watson-Jones; "Fractures and Joint Injuries."

Disease.' The tubercle is developed as an epiphysis, either by extension of the upper epiphysis of the tibia or from a separate center of ossification and it does not fuse firmly to the tibia until the age of 18. Before that time, the epiphyseal line is a weak point in the extensor mechanism of the knee. A sudden flexion movement of the joint against the resistance of the quadriceps muscle may rarely avulse the epiphysis from the tibia. Actual avulsion is prevented by the lateral insertion of the tendon to the tibial tuberosities but the epiphyseal line of the tubercle is strained. . . if the joint is not protected by immobilization repeated strains cause increased separation of the epiphysis and bony thickening develops."

Dr. Watson-Jones cites the case of a 15-year-old female European ice skating champion who rested from full training for two months while the epiphysis regained its attachment.

Some have found it necessary to support the knee in full extension by plaster casts for about two months and protection continued until relief of pain and tenderness proves that the epiphysis has become reattached to the tibia.

Another patient described by Watson-Jones was 40 years of age and complained of pain, tenderness and bony thickening of the tibial tubercle of both knee joints with inability to kneel. Symptoms had been present since adolesence and x-rays revealed old, untreated bilateral Schlatter's sprain. Failure to immobilize the joints at the time of the original injury allowed repeated separation and elevation of the epiphyses throughout the period of active growth with deposition of successive layers of bone. Watson-Jones states that small fragments cannot be replaced accurately by manipulation and operative treatment is necessary holding the fragment in its normal position by suturing the overlying soft tissue or by passing catgut through drill holes in the bone. He feels that screws, nails or pegs are unnecessary. Immobilization in plaster for 8–10 weeks is advocated and then movements regained by active exercise.

The point made here is that the complaint, since it is not a life threatening situation, can usually be taken casually but on occasion, some time for normal growth will have to be granted to the athletically inclined young male involved in an active physical education program.

As indicated by the presentation of the first case which occurred spontaneously without prior medical awareness, the incomplete union may rarely, under stress, provide an avulsion severe enough to require surgical intervention and repair.

Radiographic examinations should always be made of both knees in the lateral projection. Our observation has been that non-screen film used with the Potter-Bucky diaphragm has revealed superior radiographs; the slightly increased exposure properly coned and shielded is of little concern. Our technique is that of 100 MA, 90 KVP for 1/5 second at 30 inches with a 5-inch cone.

The trainer and coach should become fully aware of the potential hazards in allowing a complaining adolescent to continue his athletic program, not dismiss the issue lightly, nor treat with lamps, linament and taping or brand the athlete as a malinger, but refer him to the medical director for adequate examination and prescribed treatment.

A Unique Approach to the Management of Traumatic Injuries to the Lower Extremities

by Gordon Stoddard[1]

Presently in the athletic training room at the University of Wisconsin, a therapeutic modality is being used which is proving to be extremely advantageous in the management of lower extremity injuries. A coolant machine designed, built, and tested by various individuals of the University in an interdepartmental venture is now a permanent fixture in the athletic training room. Medicine, engineering, and athletic training have combined to give the athletes at the University of Wisconsin assurance of minimal discomfort and incapacitation from the various after-affects of trauma, specifically of the lower extremities.

The idea for the coolant machine was conceived by Dr. Timothy Galvez, former anesthesiologist at the University Hospital. Dr. Galvez had long been confronted with the problems of preparing a prospective amputee for surgery by lowering the tissue temperature with ice over a period of time. The length of time involved to sufficiently cool the tissue, the time element involving the nursing staff in changing the ice frequently, and the wetness from the melting ice prompted Dr. Galvez to seek a new, more efficient approach.

As Dr. Galvez narrowed his thoughts to one approach, that of a machine which would accomplish the coolant effect over a shorter period of time and involve less care by the nursing staff, he called upon Dr. John W. Mitchell of the Engineering Department for assistance. Many hours of planning, building, and testing between Dr. Galvez and Dr. Mitchell produced the coolant machine which has proven beneficial to medicine as well as to athletic training. After being assured that the coolant machine was functional and performed as he expected, Dr. Galvez approached the Wisconsin athletic training department with the idea of experimentation with traumatic athletic injuries. Through the cooperation of the team physician, athletic training staff, coaches, and athletes, the coolant apparatus was used on acute injuries with excellent results. In fact, the results have been so good that a portable unit is now being developed which could open unlimited possibilities for its use in many medical and paramedical fields.

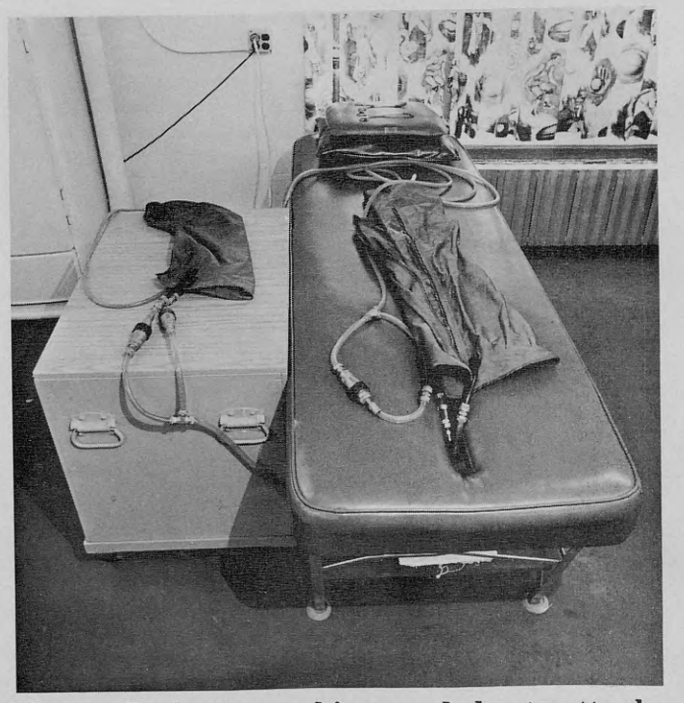

Fig. 1 Coolant machine and boot attachments.

The coolant unit was developed with the same principles found in an air conditioning unit with

[1]Head Athletic Trainer, The University of Wisconsin.

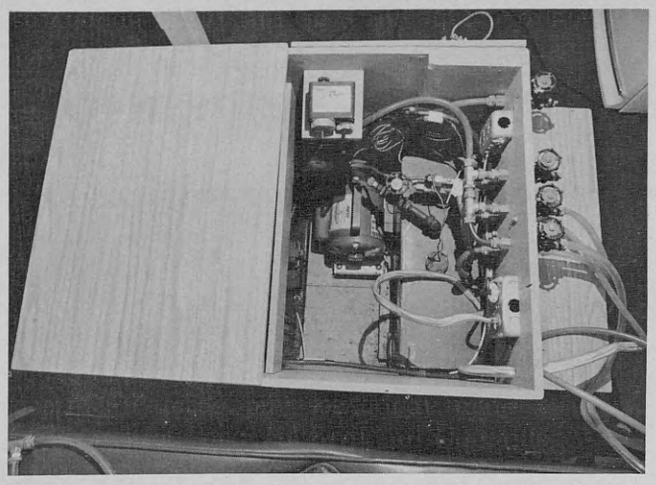

Fig. 2 Inside of machine showing compressor and reservoir.

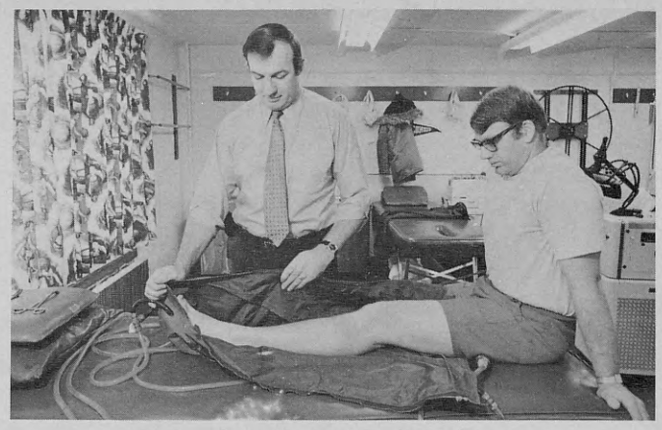

Fig. 3 Application of the boot.

a few features added to make it applicable to the extremities (Fig. 1). A mixture of alcohol and water is used as the coolant and is circulated from a reservoir (Fig. 2) in the machine through surgical tubing to a boot and back to the reservoir. The temperature of the fluid is lowered to 32 degrees and remains constant under pressure throughout the boot. The pressure inside the boot can be regulated to the patient's tolerance by adjusting the fluid output valve on the machine. The boot, developed by the "Jobst Company" especially for this venture, is made of canvas with rubberized inner surface and was made with compartments to hold the coolant under pressure as it fills and passes through. The boot is applied simply by placing the extremity into it (Fig. 3) and zipping it up in a similar manner used with an air splint application. Soon after an athlete experiences an acute lower extremity injury, the boot is applied and the valves are opened to allow the fluid to enter. As the desirable compression level is reached (Fig. 4) by adjusting the valves, the boot is elevated. Thus, the age old technique of applying cold, elevation, and compression are accomplished with exacting efficiency and the chance of swelling and discomfort are diminished almost totally. A minimum of one hour in the initial application is used. The time allotment is based on research by Dr. Galvez and is necessary to lower the tissue temperature to a desirable level. It has been our experience that this unique method of cold application has the following distinct advantages over the more conventional ice application:

(1) The coolant remains at a constant 32 degree temperature.

(2) The constriction of the vessels is accomplished over a broad tissue field.

(3) The compression can be regulated easily to the patient's tolerance.

(4) A desired cooling effect can be accomplished without guesswork and backed by research.

(5) The approach can be used efficiently in the follow-up treatment, especially of an ankle or knee injury, with greater distribution of cold than more conventional methods.

In the past two years we have used the coolant modality on all ankle and knee injuries whenever possible. Our case results, I'm sure, would appear fantastic. Without risking a flare for the dramatic, I can only say that the results have been extremely excellent. Medicine, engineering, and athletic training have combined to give many athletes at the University of Wisconsin a safe and quick return to competition after lower extremity injury.

Fig. 4 Boot filled, compressed and slightly elevated.

Astroturf or Grass as Related to Temperature Relative Humidity

by Chris Patrick and Bobby Barton

Wanting to know how to advise our football staff as to when and where our team should practice, the University of Florida Athletic Training Staff conducted a study comparing the heat and relative humidity on our grass practice fields as opposed to that on our newly installed Astroturf on Florida Field in Gainesville. The study period was from July 26 through August 5, 1971, excluding Sunday, August 1.

Although our methods may not have been as scientific as those of Einstein, Salk, or Franklin, the study was conducted to the very best of our knowledge and ability as we measured and collected our information with exacting processes using a Taylor bulb thermometer and a Bacharach sling psychrometer. Both, the grass and the turf, were measured in like manner and at the same time.

WHERE CONDUCTED?

The fifty-yard line in the center of the ninety-row, horseshoe-shaped stadium of Florida and the center of an unobstructed eight-football field practice complex on the Florida campus provided the study areas. I point out that the practice field or grass area used in this study was in the wide open spaces with presence of whatever air circulation there might have been at the time. Whereas, in the stadium, the field runs north and south with the horseshoe on the north end and semi-permanent bleachers in the south end zone possibly restricting air circulation. Shadows in the testing areas were not present after six in the morning, nor before eight in the evening.

HOW CONDUCTED?

Temperatures were taken on the fields eight times a day at elevations of 0 inches, 15 inches, and 54 inches. Relative humidity readings were also taken at the same time each day as the temperature. A bulb type thermometer was placed in the turf and in the grass for the surface temperature at point zero and a sling psychrometer was used for the temperature and relative humidity at 15 and 54 inches.

The times chosen for testing were those times in which we had practiced in the past, or times in which we thought we might desire to practice in the future and/or a combination of both.

The findings are shown in Table 1.

It should be noted that there were only two individual temperature/relative humidity readings during the course of the study that indicated that we would possibly need to alter our practice schedule. For instance, we had a reading at 15 inches above the turf at 12:00 noon one day of 91°-78% On the same day, at 12:00 noon we had a reading at 54 inches above the grass of 90°-74%.

The 54 inches reading is the reading felt to be most indicative to us as that more closely approximates the activity-temperature/relative humidity standards most commonly followed.

CONCLUSIONS

As has been noted elsewhere in this report, the average daily temperature/relative humidity above the Astroturf at 54 inches is 83.4°/73.4% and above the grass at 54 inches the average is 83.0°/76.4%.

Although Astroturf seems to heat up and cool off more rapidly than grass, for our purposes the temperature/relative humidity readings pretty much balance and cancel out any significant difference between grass and Astroturf. It seems to make no difference at Florida Field in Gainesville.

Table 1 Average Hourly Temperatures and Relative Humidity Readings at the University of Florida, Gainesville

Time	7:00 A.M.		8:30 A.M.		10:00 A.M.		12:00 Noon		3:30 P.M.		4:30 P.M.		5:30 P.M.		7:30 P.M.	
Surface Type	Turf	Grass	Turf	Grass	Turf	Grass	Turf	Grass	Turf	Grass	Turf	Grass	Turf	Grass	Turf	Grass
Avg. Temp. @ Eleva.0 in.	76	77	84.3	79.3	93.3	84	99.5	90	103	93	94.3	88.2	89.5	87	80.5	82.7
Avg. Temp./	72.5	73.0	77.0	76.3	87.0	83.6	91.0	90.0	96.7	89.7	90.6	87.7	85.7	84.0	79.5	79.2
RH @ Eleva. 15 in.	95.5	92.5	88.8	86.6	68.2	79.0	65.6	64.3	46.0	59.0	65.6	64.0	66.2	72.2	81.2	79.7
Avg. Temp/	74.0	74.7	78.2	78.0	87.4	84.6	91.0	91.5	90.6	88.1	83.0	85.1	83.1	82.5	80.3	79.6
RH @ Eleva. 54 in.	92.7	90.5	86.0	87.0	63.2	76.4	60.7	68.2	57.0	64.1	73.6	67.1	74.1	75.5	80.0	83.1

Average Daily Temperature on Turf at elevation point zero—90.0°
Average Daily Temperature on Grass at elevation point zero—85.1°
Difference of 4.9° higher on Turf

Average Daily Temperature on Turf at elevation 15 in.—85.0°
Average Daily Temperature on Grass at elevation 15 in.—82.6°
Difference of 2.4° higher on Turf

Average Daily Temperature on Turf at elevation 54 in.—83.4°
Average Daily Temperature on Grass at elevation 54 in.—83.0°
Difference of 0.4° on Turf

Average Daily Relative Humidity on Turf at elevation 15 in.—72.1%
Average Daily Relative Humidity on Grass at elevation 15 in.—74.6%
Difference of 2.5% lower on Turf

Average Daily Relative Humidity on Turf at elevation 54 in.—73.4%
Average Daily Relative Humidity on Grass at elevation 54 in.—76.4%
Difference of 3.0% lower on Turf

Highest temperature on turf at 0 in.—110° at 3:30 P.M.
Highest temperature on grass at 0 in.—96° at 3:30 P.M.
Lowest temperature on turf at 0 in.—74° at 7:00 A.M.
Lowest temperature on grass at 0 in.—76° at 7:00 A.M.

Greatest difference w/turf temperature higher at 0 in.—turf 106° grass 90° at 3:30 P.M.
Greatest difference w/grass temperature higher at 0 in.—turf 74° grass 76° at 7:00 A.M.

Highest temperature on turf at 15 in.—99° at 3:30 P.M.
Highest temperature on grass at 15 in.—94° at 12:00 Noon
Lowest temperature on turf at 15 in.—72° at 7:00 A.M.
Lowest temperature on grass at 15 in.—73° at 7:00 A.M.

Greatest difference w/turf temperature higher at 15 in.—turf 99° grass 88° at 3:30 P.M.
Greatest difference w/grass temperature higher at 15 in.—turf 85° grass 90° at 5:30 P.M.

Highest temperature on turf at 54 in.—98° at 3:30 P.M.
Highest temperature on grass at 54 in.—98° at 12:00 noon
Lowest temperature on turf at 54 in.—72° at 7:00 A.M.
Lowest temperature on grass at 54 in.—72° at 7:00 A.M.

Greatest difference w/turf temperature higher at 54 in.—turf 87° grass 80° at 10:00 A.M.
Greatest difference w/grass temperature higher at 54 in.—turf 93° grass 98° at 12:00 noon.

Potpourri

NEW SURGICAL PROCEDURE

Half a group of 52 athletes who underwent a five-step knee operation were able to return to their sport after all other efforts at rehabilitation had failed, was a comment from the orthopaedic surgeon for the New York Jets professional football team.

The operation, called "Five-one," was developed for knee instability that had been present for many months or years. Some of the patients had suffered the injury as high school or college athletes. Some were professional football players. Others were competitors in basketball, tennis or track. Two were outstanding women athletes.

Dr. James A. Nicholas said athletes were selected for the first 52 patients because they are highly motivated individuals. A number of operations have now been done on others who are not so highly motivated, and many of these have done well too. Some were middle-aged and sought restoration of stability for everyday function.

In addition to the 27 athletes who returned to their sport without need to wear a brace, there were 17 others who were able to play but required a so-called derotation brace.

Many have found that use of a brace along with a strict exercise program enables them to regain enough power so that an operation is not necessary. How well the operation will stand up requires time to assess, he said. Individuals who have not had surgery prior to the 5-1 knee procedure have the best chance for success.

Dr. Nicholas, Director of the Lenox Hill Hospital Department of Orthopaedic Surgery, is also the New York Rangers team physician and orthopaedic consultant to the U. S. Military Academy, West Point, New York.

STEINMARK MOVIE

Filmmaker Martin Jurow announced plans for a full-length motion picture based on the struggle with cancer by University of Texas football player Freddie Steinmark, who died last June. Jurow said the film will be shot primarily in Austin during the next year. Steinmark was a defensive safety on the 1969 Longhorn football team which won the national championship. His left leg was amputated six days after the last regular season game against Arkansas.

DIAGNOSTIC CLUE

If an athlete feels or hears a sudden pop deep within the knee after a violent twist of the joint, if he is unable to continue playing, and if a swelling develops overnight, the likelihood is that a ligament tear has occurred and surgery is required.

Lieut. Col. John A. Feagin, chief of orthopaedic service of the U. S. Military Academy, West Point, New York, presented 64 cases before the American Academy of Orthopaedic Surgeons to document this presumption. Ninety percent of the knees explored had a tear of the anterior cruciate ligament.

Surgical repair was possible in 49 of the 64 patients. In the first 30 knees followed over two years, results have been graded good or excellent in 25.

If surgery is not performed, progressively instability and finally frank internal derangement usually follows in 6 to 36 months, Dr. Feagin said.

A LITTLE GOES A LONG WAY

Twenty or thirty minutes of exercise three days a week is all that is needed to maintain a youthful, functioning cardiovascular system, according to research at the Human Performance Laboratory at South Dakota State University.

Research on cardiovascular fitness indicated that adult groups up to 62 years of age show comparable fitness to S.D.S.U. freshmen when moderate exercise is routine. S.D.S.U. freshmen ranked high in fitness levels when compared to college freshmen groups nation wide. This was attributed to the predominantly agricultural background where hard physical labor was part of the daily schedule.

Paul Brynteson, laboratory director, indicated that, as a rule of thumb, heart rates should be elevated from 120 to 150 for exercise to be beneficial. He said that 150 beats per minute is recommended for a person in his twenties, lowering to 120 for a person in his sixties.

OLYMPIC COSTS SOAR

In this day of inflation, athletic contests hold no exemption. The cost of presenting the 1972 Olympic Games in Germany was estimated at $12 million original estimate, represents expenses at the main sports complex in Munich and the yachting area in Keil.

NATA

Presidential Candidates

ROBERT H. GUNN

ROBERT H. GUNN, whose present position is head trainer for the Houston Oilers, received his B.S. degree from Rice Institute, 1951, became a certified corrective therapist, 1955, and a certified athletic trainer in 1970.

His experience includes being assistant trainer, Rice Institute, 1947-1951; trainer, Brazosport Indet. School Dist., Freeport, Texas, 1951-1957; trainer, Baytown Public Schools, Baytown, Texas, 1957-1960; trainer, Lamar State College of Technology, Beaumont, Texas, 1962; assistant trainer, Houston Oilers (pre-season), 1962, 1969, 1970; trainer, U.S.A., Pan American Games, Chicago, 1959; trainer U.S.A. Soccer Team, Mexico City, 1964; head trainer, Washington Redskins, 1971; and his present position as head trainer for the Houston Oilers.

He has held office as vice president, Southwest Athletic Trainers Assn., 1955-56, President; S.A.T.A., 1956-57, 1957-58; Board of Directors, National Athletic Trainers Assn., 1964-65, 1965-66, 1966-67, 1967-68; Chairman, Board of Directors, N.A.T.A., 1966-67, 1967-68; President, National Athletic Trainers Assn., 1970-9171.

Mr. Gunn has given lectures before the Texas Medical Assn., 1964; Nebraska Medical Assn., 1965, 1966; Florida Coaches Assn., 1966; Florida Medical School, 1969; Rhode Island Sports Medicine Conf., 1968; Missouri Coaches Assn., 1966; Southwest Athletic Trainers Assn., 7 years; and the National Athletic Trainers Assn., 1963.

He has published articles in the following publications: *Texas Medical Assn. Journal American, Football Coaches Assn. Journal, Coach and Athlete,* and *Scholastic Journal.*

REPORTS

for 1972 NATA Election

BRUCE MELIN

BRUCE MELIN, whose present position is Associate Professor of Physical Education and Head Athletic Trainer at Washington University, St. Louis, Mo., received his B.A. degree from the University of Minnesota, 1944, and his M.Ed. degree in 1948. He continued his graduate work at the University of Minnesota in physical education and physiology during 1948–49.

His experience includes being Assistant in U of M Training Room, 1948-49, and being appointed Head Athletic Trainer and Instructor in Physical Education at Washington University, St. Louis, Mo., in 1949. At present, he is Associate Professor of Physical Education, Head Athletic Trainer, and Associate Director of Athletics at Washington University.

He has held office as District 5 Director, 1969 and 1970, and was a member of the Reorganization Committee. Presently, he is chairman of the National Membership Committee, Board of Directors Parliamentarian, and Chairman of the Program Committee for the 1972 Annual Meeting.

Mr. Melin has been a speaker at the AMA Conference on Medical Aspects of Sports, 1969; at many local high school meetings on Athletic Training and symposia on Prevention of Injuries in Sports; and at several sessions on Medical Aspects of Sports sponsored by St. Louis Medical Society.

National Athletic Trainers Association

Mid-Year Board of Directors Meeting
January, 1972
O'Hare Inn
Des Plaines, Illinois

The first session of the Mid-Year Board of Directors Meeting was called to order at 9:30 P.M., January 26, 1972, by President Bobby Gunn. Those in attendance were:

District 1—Frank George
District 2—Francis J. Sheridan
District 3—Joe Gieck
District 4—Dale Googins, representing Roland LaRue
District 5—Bruce Melin, representing Byron Bird
District 6—Tom Wilson
District 7—Rodney Kimball
District 8—Edward Byrne, representing Lewis Crowl
District 9—Warren Morris
District 10—Mert Prophet
President—Bobby Gunn
Executive Director—Otho Davis

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

II. Mr. Bruce Melin, Program Chairman for the 1972 (St. Louis) Convention, presented a progress report. The theme for this convention is "Keeping High Standards."

III: Representation to the American Physical Therapy Association Convention to be held in Las Vegas, Nevada on June 12-17, 1972 was discussed.

A motion was made by Mr. Morris and seconded by Mr. Sheridan that, due to the date of the A.P.T.A. Convention, the N.A.T.A. not send an official representative to this meeting this year (1972).

ACTION: Approved

IV. A report was presented on the Scientific Exhibit. It will be used one (1) time this year as approved by the Board of Directors at the June, 1971 meeting. This will be at the American Personnel and Guidance Association Convention in Chicago, Illinois, March 26-30, 1972. An evaluation will be made by the Board of Directors in June, 1972 if the Association (N.A.T.A.) will continue to use the Scientific Exhibit.

V. An Ad Hoc Committee was appointed by President Gunn to study the history and archives of the Association. Members are Roland "Duke" LaRue and Jack Cramer.

VI. A motion was made by Mr. Sheridan and seconded by Mr. Morris for the appointment approval of Gordon Graham as Research Committee Chairman.

ACTION: Approved

VII. A motion was made by Mr. Gieck and seconded by Mr. Googins for the approval of a committee change. . .Dennis Aten from the Public Relations and Information Committee to Journal Committee.

ACTION: Approved

VIII. A motion was made by Mr. Googins and seconded by Mr. George for the approval of a committee change. . .Kent Falb from the Placement Committee to Public Relations and Information Committee.

ACTION: Approved

IX. A motion was made by Mr. Googins and

seconded by Mr. Morris for the approval of selection of Bobby Barton to the Placement Committee.

ACTION: Approved

X. A motion was made by Mr. Sheridan and seconded by Mr. Byrne to accept the resignation of Don Fauls as Honorary Award Committee Chairman and to have the obligations fulfilled by George Sullivan.

ACTION: Approved

XI. A motion was made by Mr. Gieck and seconded by Mr. Googins that the Executive Director investigate a life insurance policy or program for travel of authorized representatives of N.A.T.A. to any meeting.

ACTION: Approved

XII. A report was presented on liability insurance coverage for N.A.T.A. members. Several companies are interested, but some of the rates have been too high.

A motion was made by Mr. Kimball and seconded by Mr. George to continue investigating this subject and make a report in June.

ACTION: Approved

XIII. A discussion was held in reference to a Student Member Recommendations Committee. The Board of Directors do not believe this is necessary and will invite suggestions from student members.

A motion was made by Mr. George and seconded by Mr. Sheridan to assist all student members in any way possible, but not form a special student committee.

ACTION: Approved

XIV. A report on workshops, clinics, etc., was tabled until June, 1972.

XV. A report on the realignment of districts was discussed.

A motion was made by Mr. Gieck and seconded by Mr. Googins to leave all districts as they presently are.

ACTION: Approved, 8-0-2

The Board recessed at 12:48 A.M., January 27, 1972, with instructions to reconvene at 9:00 A.M., the same day.

Friday, January 27, 1972, the Board reconvened

at 9:00 A.M. Those in attendance were the same persons as the previous night.

XVI. A discussion was held in reference to persons in military service and dues. A motion was made by Mr. George and seconded by Mr. Sheridan that a member in military service shall pay regular Association dues if he remains in the military service longer than his initial enlistment.

ACTION: Approved

XVII. A discussion was held in reference to the title of Division Director, National Program and Business Affairs as listed on p. 23, The By-Laws of the N.A.T.A., 1970.

A motion was made by Mr. Kimball and seconded by Mr. Wilson to change the title of Division Director, National Program and Business Affairs from the aforementioned to Division Director, National Convention.

ACTION: Approved

XVIII. A discussion was held in reference to the realignment of the Membership Committee from the National Convention Division to the Executive Director.

A motion was made by Mr. Sheridan and seconded by Mr. Gieck that the Membership Committee be directly responsible to the Executive Director.

ACTION: Approved

XIX. By action of the Board of Directors at its meeting on June 8, 1971 in Baltimore, Maryland the term of office of elected representatives on the Board (a district director from each of the ten districts) was changed from two years to three years. The term of office of Division Directors was not changed.

In accordance with this action, the following shall replace the current statement regarding the terms of office of Division Directors and elected representatives (District Directors) of the ten N.A.T.A. districts on the Board of Directors (second paragraph on p. 4 of the Reorganization Plan):

Term of Office: The term of office of Division Directors shall be three (3) years. The term of office of elected representatives (District Directors) shall be three (3) years.

The elected representatives of the ten (10) N.A.T.A. Districts will serve terms such that District Directors will begin their duties as members of the Board of Directors at the second meeting of the Board in June in accordance with the following triennial schedule:

Districts 1, 4 and 7....	1971 and every third year thereafter.
Districts 2, 5 and 8....	1972 and every third year thereafter.
Districts 3, 6, 9 and 10	1973 and every third year thereafter.

A motion was made by Mr. Gieck and seconded by Mr. Wilson to accept the term of Office as stated above.

ACTION: Approved

XX. A motion was made by Mr. Melin and seconded by Mr. Byrne that the definition of the term "actively engaged in athletic training" be inserted at the beginning of the description of the membership classes.

ACTION: Approved

XXI. A discussion was held in reference to the position of Vice President, to be elected yearly from the Board of Directors in office. The Vice President has no administrative functions except as the President or Executive Director might request. He is in a capacity in the event something happens to the President.

The first term of office shall be from January, 1972 to June, 1973, and every year thereafter. Election will be in June.

Mr. Fran Sheridan was elected by the Board of Directors to serve as Vice President.

XXII. Candidates for consideration by the Board of Directors for nomination for President (June, 1972 to June, 1974) were: Bobby Gunn, Bruce Melin and Richard Vandervoort.

By secret ballot the Board selected Bobby Gunn and Bruce Melin to be presented to the membership for vote by the certified members for President of N.A.T.A.

XXIII. Following discussion, a motion was made by Mr. Gieck and seconded by Mr. Morris that the N.A.T.A. and the American Corrective Therapy Association (A.C.T.A.) establish a joint study of the undergraduate curriculum. This study will be made by Mr. Bud Miller, N.A.T.A., and Mr. Clyde Carpenter, A.C.T.A.

ACTION: Approved

XXIV. A report was presented to the Board by President Gunn in reference to the N.C.A.A. Drug Education Committee. Mr. Al Hart was recommended to the N.C.A.A. as the N.A.T.A. representative to this committee.

XXV. The William E. Newell Scholarship from the Cramer Chemical Company was discussed. A full report will be presented in June, 1972 to decide if this scholarship will be continued or not.

Wilson

XXVI. The position of the National Exhibits Manager was discussed by the Board and tabled until the June, 1972 meeting for further study.

XXVII. The selection of Olympic and Pan American Game Trainers was discussed. The following proposal was presented:

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 selection for each eighteen (18) certified members in the district.

(For the selection committee to have forty-five names, the formula used was 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 hundred 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) 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: Tabled until June, 1972 to allow Directors to inform their respective members.

XXVIII. A motion was made by Mr. Sheridan and seconded by Mr. Wilson that the Executive Director may or may not charge for the use of the Association mailing list by outside agencies and may establish the fee for such use.

ACTION: Approved

XXIX. A motion was made by Mr. George and seconded by Mr. Prophet that the National Convention registration fee be as follows:

Members	$10.00
Students	$ 5.00
Non-Members	$20.00
(Including Student non-members)	
Retired and Honorary	NONE

ACTION: Approved

XXX. A motion was made by Mr. Melin and seconded by Mr. Sheridan that the Recruitment Committee postpone the production of any brochure as requested by the Board in June of 1971 until all the present brochures are used. Also, Mel Blickenstaff is requested to prepare copy for a new brochure to be presented to the Board in June of 1972.

ACTION: Approved

XXXI. Accreditation as an allied health profession with the American Medical Association was discussed. The Board of Directors desire more information on this subject.

A motion was made by Mr. Morris and seconded by Mr. Wilson that the A.M.A. allied health profession accreditation be tabled for future consideration.

ACTION: Approved

XXXII. Mr. Melin, Parliamentarian, presented changes in the Constitution for consideration. A motion was made by Mr. Sheridan and seconded by Mr. Googins to accept the changes in the Constitution as submitted by Mr. Melin to the Board. These changes will also be mailed to the certified membership for consideration prior to a final vote at the National Business Meeting at the Convention in St. Louis in June, 1972.

ACTION: Approved

XXXIII. Mr. Melin, Parliamentarian, presented changes in the Code of Ethics. A motion was made by Mr. Gieck and seconded by Mr. Sheridan to accept the changes as presented by Mr. Melin. These changes in the Code of Ethics are part of the By-Laws and are not subject to a membership vote. Copies of the new By-Laws will be mailed to the membership.

ACTION: Approved

XXXIV. The 1976 convention in Boston was discussed. Further plans will be presented in June.

XXXV. Directors were instructed to inform their members that. . . "A person who is a member in one of the N.A.T.A. Districts must also be a National Member and pay both National and District dues. An N.A.T.A. Member must hold District Membership in the District in which he is employed."

Meeting Adjourned

Book Reviews

A recent and significant contribution to the field of athletic training literature comes in the form of a book published by the American Medical Association entitled *Fundamentals of Athletic Training.* It is a result of a joint project of the National Athletic Trainers Association, the Athletic Institute, and the medical Aspects of Sports Committee of the American Medical Association.

Particularly guided towards the high school, the authors concede that the availability of a qualified athletic trainer at the high school level is generally scarce, and this lack of trainers cannot be as easily remedied as the scarcity of team physicians at the same level.

With the idea for the book being strongly backed by the Medical Aspects of Sports Committee of the American Medical Association, the initial drafts of the text enjoyed the attention of many well-known sports medicine authorities, team physicians and athletic trainers who served as contributors and reviewers.

Fundamentals of Athletic Training very adequately covers a multitude of topics that an individual who is serving in the capacity of an athletic trainer at the high school level can refer to for knowledge and guidance—topics that pertain to most every aspect of handling the high school athlete. The duties of the athletic trainer, with respect to his legal and ethical responsibilities, is clearly stressed.

Without burdening the reader with details, the volume covers those basic areas encountered by athletic trainers dealing with health supervision, facilities, nutrition, mental readiness, drug use and abuse, physical therapy, protective equipment, protective taping, conditioning, and evaluation and records. Of particular note are sections dealing with nutrition, drug use and evaluation and records.

With nutrition receiving a great deal of national emphasis with respect to dieting, food supplements and performance enhancing foods, the nutrition section presents to the reader sound and basic guidelines for successful and healthful nutrition of the high school athlete.

Drug use and abuse is covered completely enough to instill the idea that drugs are to be handled only by the Physician or under Physician's orders, at the same time showing that some drugs are, or can be, beneficial while others are widely misused.

For those who are constantly battling the paper work of athletic training, the section on records and evaluation includes some sound and basic rational and suggestions for making this very important part of athletic training somewhat easier.

It was refreshing to this reviewer to note the degree of frankness in some sections with remarks such as: "It is dubious

that any further advantage can be gained from these devices" (pertaining to the discussion of the use of the more sophisticated therapeutic modalities), and "the laborious part of being concientious is the paper work involved." Another refreshing part of the book was the section dealing with the promotion of athletic training as a career. It is always satisfying to read what accomplishments have been gained over the 22 years with respect to upgrading and advancing athletic training as a profession. The authors do well in presenting the many advantages and possibilities open to those who are perhaps thinking of athletic training as a career.

In 128 pages, the authors have presented a very concise and comprehensive volume on athletic training. The price of *Fundamentals of Athletic Training* is $2.00 and can be purchased from the American Medical Association, 535 N. Dearborn St., Chicago, Ill. 60610.

• • •

A conference on biomechanics was held August, 1971 at the Pennsylvania State University. From those meetings came the *Proceedings of the Pennsylvania State University Biomedical Conference.*

After having to turn away some 45 registration requests, the five-day conference, attended by 35 national and international representatives, touched on many aspects of biomechanic analysis—from establishment of undergraduate and graduate curriculums, establishing and equipping biomechanical laboratories, cinematographic and computer simulation techniques, to gamma ray techniques of determination and knowledge of present bio-mechanics programs presently being carried on in Europe.

Of particular interest to the athletic trainer is a presentation of a study on knee ligament stability and its relationship to knee injuries, presented by Dr. C. A. Morehouse. Instrumentation assessed knee stability before and after an exercise program (squat jumps) with no significant increase being noted due to the exercise program.

Knee strapping support was investigated and it was found that the initial strapping prevented lateral deviation of the knee, but after 5 minutes of vigorous (sweat producing) exercise, little evidence of support, due to strapping, was present. Another study reported that "persons with greater knee instability are not more prone to injury." Additional information on these studies can be obtained from Dr. Morehouse at Penn State.

Studies on different aspects of temperature, traction and performance of artificial turf were undertaken and reported upon.

Electromyographic kinesiology was discussed and its effectiveness demonstrated with discussions of posture and also the relationship between muscles and ligaments of the foot and the knee.

The *Proceedings* suggested that those involved with sports research be reminded of the following guiding principles:

- Extend invitations to coaches to suggest problems for research
- Recognize the limitation of applied research
- Be as unobtrusive as possible in conducting studies
- Results of research should be given to coaches
- Researchers report to coaches, not players
- Write reports in nontechnical language

The *Proceedings of the Pennsylvania University Biomedical Conference* can be obtained from the Department of Health, Physical Education and Recreation, The Pennsylvania State University, University Park, Pennsylvania 16802, for $2.50.

• • •

Strength, Power and Muscular Endurance for Runners and Hurdlers by John Jesse incorporates many aspects of training programs of different types for strength, flexibility and performance of runners and hurdlers. Jesse's second effort in bringing strength training to the world of athletics covers his subject much more thoroughly than did his first. His first book was *Explosive Muscular Power for Championship Football.*

Dividing the book into three parts, (1) Requirements and Basis for Development of Strength, (2) Weight Training Systems, Procedures and Equipment, and (3) Exercise and Schedules, Jesse complies into the volume much knowledge that can be extracted from many single sources. Perhaps the success of the book might lie in the fact that for $2.95, a track athlete or high school coach can secure some information on stretch training, nutrition, kinesiology, injury prevention, training programs and physiology as it pertains to track, without going into a myriad of detail.

The book is well illustrated and can be obtained from the Athletic Press, P. O. Box 2314-D, Pasadena, Calif. 91905.

Abstracts

"Microclimate Over Artificial Turf," Buskirk, E. R., McLaughlin, E. R., and Loomis, J. L., *Journal of Health, Physical Education and Recreation*, **29-30, November-December, 1971.**

Studies on the artificial turf at Pennsylvania State University show the turf often heats to much higher temperatures than natural grass. The study covered 24 days. When air movement is low, the temperature differential between turf and grass was greatest with a 28°F cooler average on natural turf. Before sunrise, the artificial turf is cooler. With the turf temperature at 125°F, the sock-sole shoe interface of a 135-pound subject rose to 105°F in 5 minutes and in a 196-pound subject 107°F in 5 minutes. The center of the field is hotter than the sidelines. August temperatures were suggested to be higher than September data. Of practical significance is the need for coaches to be aware of the added heat stress artificial turf provides for the athlete and the need to regulate workload accordingly.

P. B. Donley

"The Facts About Fake Grass," Lashbrook, Lynn, *Journal of Health, Physical Education and Recreation*, **28-29, November-December, 1971.**

Twenty-four athletic directors from colleges that have artificial turf responded to a questionnaire. Results showed (1) increased availability of football stadium, (2) three times as many activities on the surface, (3) two times as many games on the field, (4) 91.7% of colleges use as a practice field, (5) 91.7% reported a decrease in annual maintenance cost by 30-90%, (6) knee surgeries were reduced from an average of 2.5 per school in 1970 from a 4.3 average per school in the last full season before installation of artificial turf, (7) all the athletic directors would recommend their brand of turf to another college, and (8) one third of the colleges reported an increase in revenue for rentals. A list of ten suggestions for purchasing and nine suggestions for installation is included.

P. B. Donley

"Effect of Selected Exercise Variables on Ligament Stability and **Flexibility of the Knee," Meyers, Earle J.,** *The Research Quarterly*, **Vol. 42:411–422, December, 1971.**

The purpose of this study was to investigate the effect on the collateral knee ligaments, flexibility of the knee, and quadriceps muscle strength of, (1) the deep squat, (2) the half squat, (3) near maximum resistance, (4) the absence of added resistance, (5) maximum speed of movement, (6) minimum speed of movement, and (7) interaction between these factors.

Each of the 69 male Caucasians, ranging in age from 17 to 29 years of age, was placed in one of eight experimental groups. One week was used for pre-testing, eight weeks for specific exercises with three exercise periods per week, and one week for post-testing. Tests for collateral ligament stability were performed on the Klein Mediolateral Collateral Ligament Testing Instrument. Static strength of the quadriceps muscles was obtained by using the cable tensiometer. Knee joint flexibility was measured by the Leighton Flexometer. The subject's kicking foot was designated as the subject's dominant leg.

A three factor $2 \times 2 \times 2$ experimental design was employed utilizing multivariate analysis of covariance with fixed effects using pre-test scores as covariants. The hypotheses were tested in null form at the 0.05 level by a series of independent planned comparisons. The null hypotheses were not rejected. However, several statistically significant variables were found. Flexibility was greater in knees exposed to the half squat exercise with near maximum resistance. When knees executing the deep squat with maximum or minimum speed were compared, quadriceps strength favored the maximum speed group. Significant interaction occurred when speed and resistance were tested within the deep squat. Medial collateral ligament stretch increased in both groups, but, the maximum speed and near maximum resistance group's increase was significantly greater than the minimum speed and minimum resistance group's increase.

The only specific recommendation made by the author was for further investigation.

John Wells

"Athletic Injuries at the University of Toronto," McIntosh, D. L., Skrien, T. and Shephard, Roy J., *Medicine and Science in Sports*, **Vol. 3; No. 4; 195-199, 1971.**

This study deals with analysis of injuries reported in the Intercollegiate and Intramural programs at the University of Toronto between 1951–1969. A recommendation is made for a more

uniform system of injury reporting, preferably on an international agreed basis.

The results of the study are discussed in terms of factors that expose the statistical analysis of this long-term study. The following factors are mentioned with a brief discussion of each.

Average Injury Rate. The total number of injuries reported was 10,216. Emphasis is placed on the distribution of the injuries in relation to I-C team sports, I-M team sports and "individual" sports. Within this time period long-term increases and decreases of injury rates were discussed in relation to the number of participants and experience of participants.

Comparison of Intramural and Intercollegiate Injury Rates. This section deals with the rates of I-C program compared to the I-M program injury rate.

Time of Year. This area discusses the calendar months when the total number of injuries were high and low due to the number of participants.

Academic Factors. This section deals with the academic backgrounds, grouping the participants by their schools.

Types of Injuries. Anatomically, the number of injuries are reported. Specific sports, both I-M and I-C programs, are noted for the high proportion of injuries, but the knee, ankle, shoulder and fingers are noted as being the areas most frequently involved.

Recurrent Injuries. Certain sports have a much higher incidence of recurrent injuries. Specific injuries are noted regarding their recurrence rate.

The final area of the paper deals with variables that increased or decreased injury rates. These variables included facilities, rules, and protective equipment. The other factors, previously mentioned, are also analyzed in relation to variables that influenced the relative number of injuries and their rates.

Injury reporting has many aspects that need examining. As the authors have stated, this examination would be greatly facilitated by a uniform reporting system. The authors give specific information that should be studied for an injury reporting form. They hope that such factors mentioned will help resolve the problems of reporting injuries and show the need for an international committee on such matters, so that a preventive measurement will make sport participation safer.

Bruce C. Scott

"Variation in Total Body Water with Muscle Glycogen Changes in Man," Olsson, K. E., and Saltin, B., ***Acta Physiological Scandinavia,*** **1970.**

A study using 19 Physical Education students (mean age of 24) was conducted for seven days. After hard work, they ate only fat and protein for two days; nothing the third day; carbohydrate and protein the fourth, fifth and sixth days; and then nothing on the seventh day. Water intake and activity were uniform during the period. Measurements of total body water, body weight and muscular glycogen on the third day and seventh day were made and compared.

Their results seemed to indicate that an increase of stored muscle glycogen caused an increase in body weight significantly more than the increased amount of glycogen. This increase in weight is due to water deposits which probably are intracellular.

Kenneth Knight

Recent Athletic Training Literature

This list is generally restricted to subject matter considered to be areas of athletic training and athletic rehabilitation. Topics belonging to broader areas such as athletics, physical education and physical therapy will usually be omitted.

"An Investigation into the Effectiveness of Various Forms of Quadriceps Exercises," Gouch, J. V., et al., *Physiotherapy*, 57:365, August, 1971.

"Beat the Weight-Loss Problem," Blanchard, D. C., *Scholastic Coach*, 41:88, March, 1972.

"Biomechanics of Internal Derangement of the Knee. Pathomechanics as Determined by Analysis of the Instant Centers of Motion," Frankel, V. H., et al., *Journal of Bone and Joint Surgery*, 53A:945-62, July, 1971.

"Cartilage Repair," Cruess, R. L., *Journal of Bone and Joint Surgery*, 53B:365, August, 1971.

"Cool 'Em Down," Louko, J. C., *Athletic Journal*, 52:77, January, 1972.

"Comparing the Three Best Ways of Developing Strength," Hinson, M., and Rosentswieg, J., *Scholastic Coach*, 41:34, March, 1972.

" 'Cracking Joints.' A Bioengineering Study of Cavitation in the Metacarpophalangeal Joint," Unsworth, A., et al., *Annals of Rheumatic Diseases*, 30:348-58, July 1971.

"Does Ankle Taping Slow Down Athletes?," Thomas, J. R., and Cotten, D. J., *Coach and Athlete*, 34:20, November, 1971.

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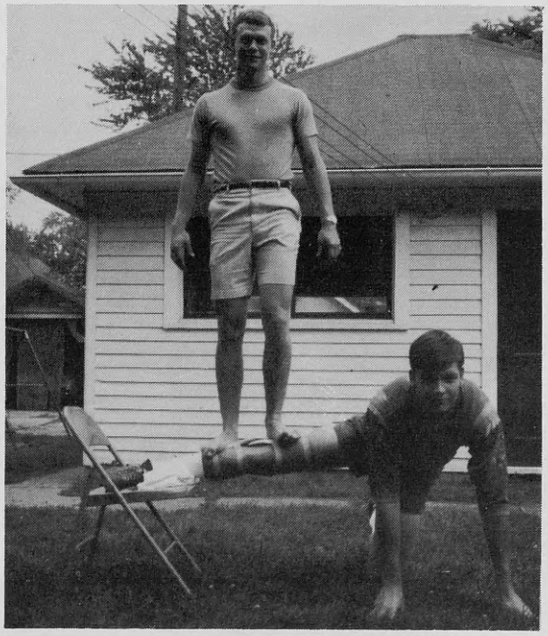

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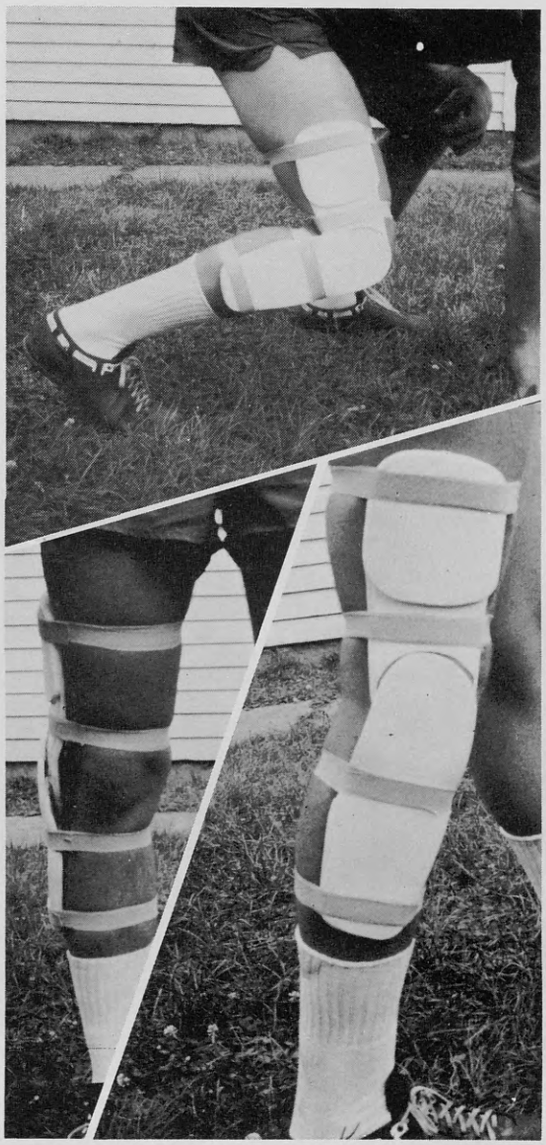

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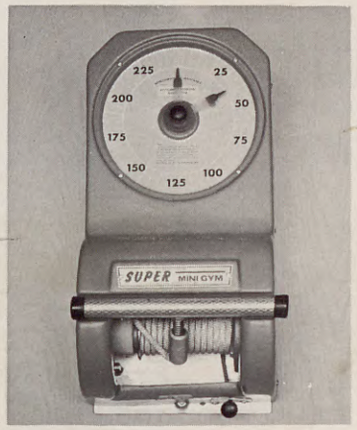

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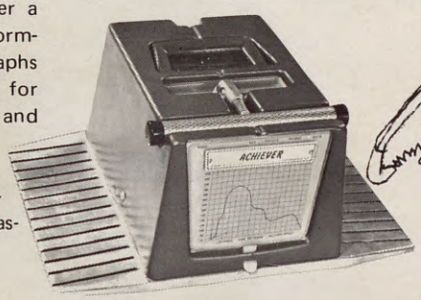

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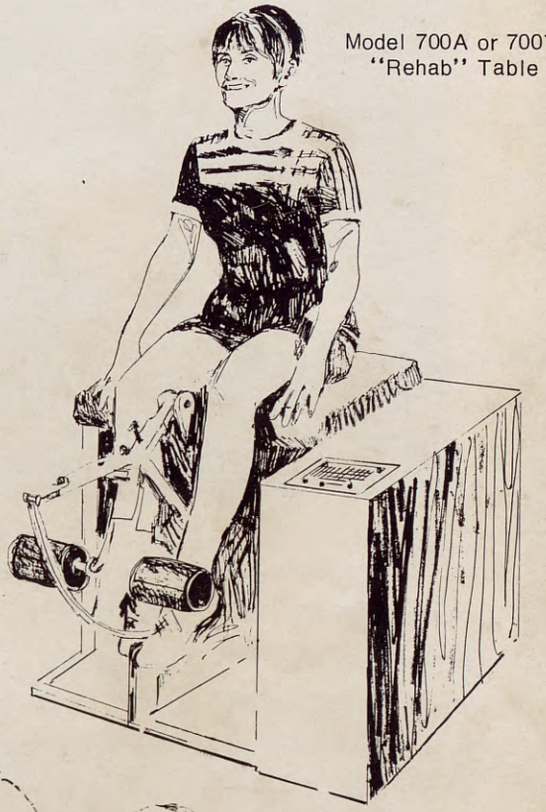
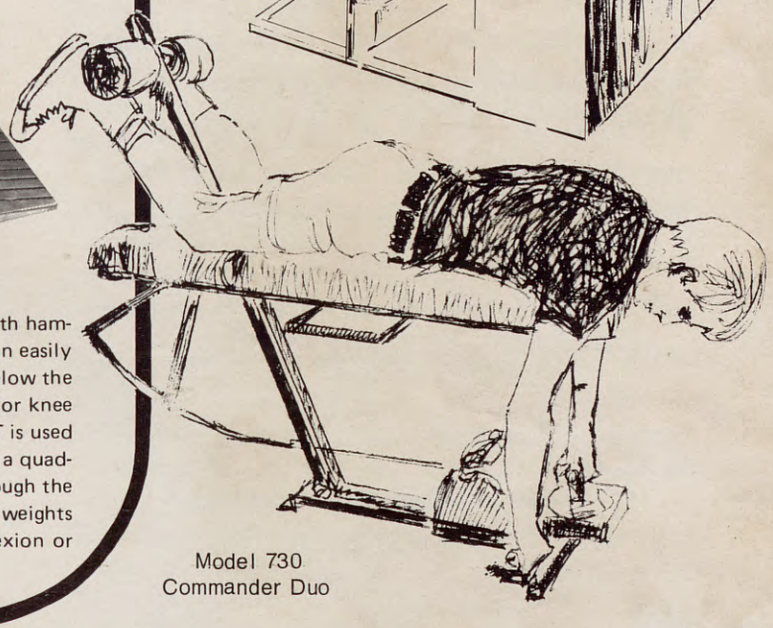
Model #730

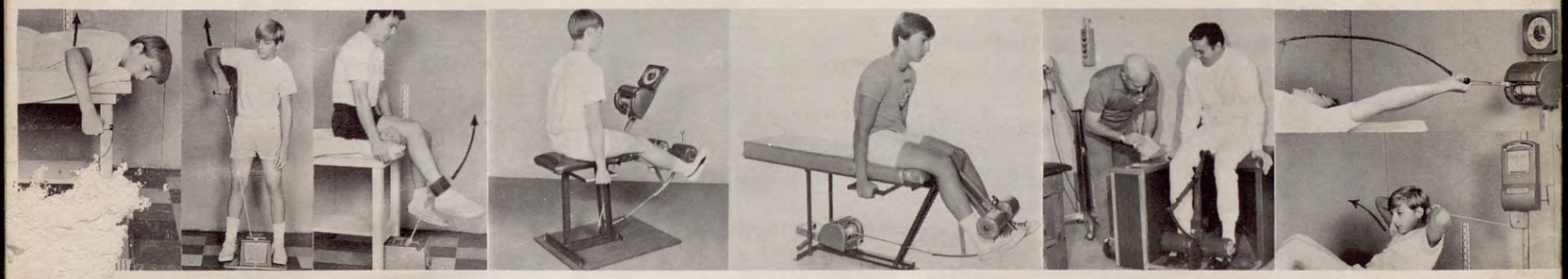
The "Commander Duo" Model 730 Hamstring Exerciser is designed for both hamstring and quadricep exercise. As the patient does knee flexion, the individual can easily view the amount of effort he is exerting as the exerciser is stationed directly below the table. The seat slides back and the quadrant readjusts 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 700A or 700T
"Rehab" Table



Model 730
Commander Duo



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