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FEBRUARY 1963

OF THE

NATIONAL ATHLETIC TRAINERS ASSOCIATION

14th ANNUAL MEETING

CINCINNATI, OHIO, JUNE 9, 10, 11, 12, 1963

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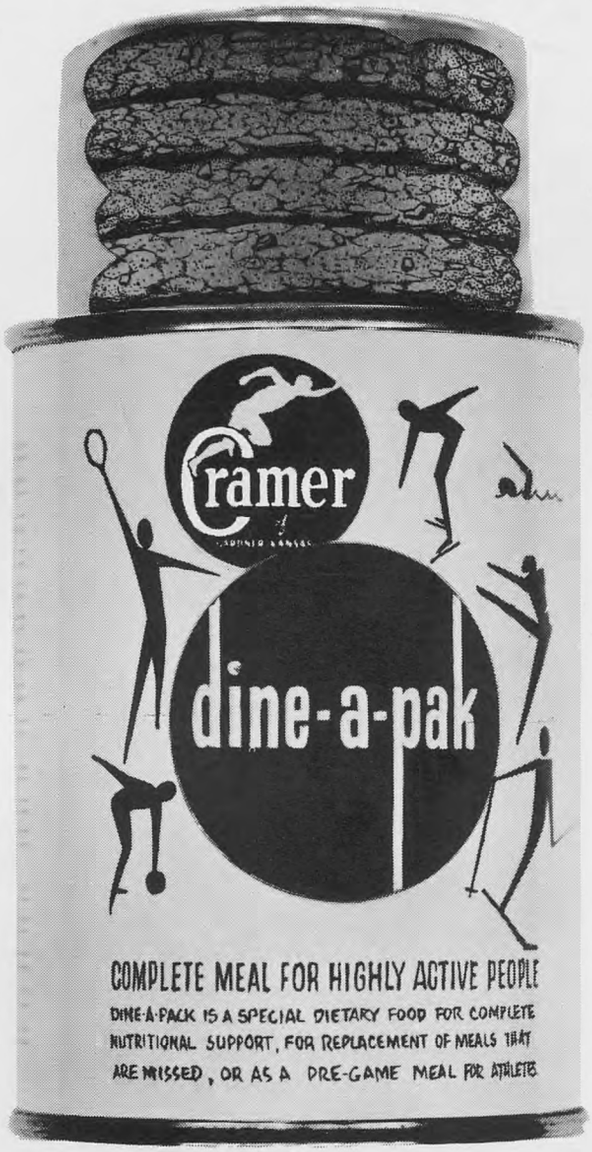

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EDITORIAL

In the life of any organization there comes a time when the group must align themselves with one side or another in a controversy. The time has come when the N.A.T.A. feels it is the duty of this association to give full support to the newly formed Athletic Federations of the United States in their disagreement with the A.A.U. of the United States. The N.A.T.A. has joined the National Federations of Track, Field, and Basketball.

I am sure many people are aware that a fight for control of amateur sports in the United States is going on, however, so much of the background and reasons for this dispute is not commonly known to the average person. This disagreement is not just a recent thing, it has been building for years. The A.A.U. has failed to keep up. It has not changed its views and policies with the change in our amateur situation in this country. The day of the Athletic Clubs that compete in amateur sports is almost extinct compared to twenty-five years ago. Today, the great majority of our amateur athletes come from high schools, colleges, and the Armed Services. Yet the administration of these groups has had an almost non-existent voice in policy formation and planning in the A.A.U.

In 1960, the N.C.A.A. cancelled their article of alliance with the A.A.U. and gave the following reasons:

1. Inconsistent administration of rules and regulations.
2. Inadequate administration of eligibility requirements.
3. Lack of harmony and good will in arranging and controlling foreign sports trips.
4. Inability to secure necessary cooperation with sister organizations to advance the best interests of amateur sports.

After having read committee reports and talked with various committee members of the N.C.A.A. and Federations, I am amazed at some of the arguments and attacks the A.A.U. has made on the N.C.A.A. In my opinion these attacks are unjustified and sound as if the A.A.U. is fighting for their life. One committee member stated that it was like the cavalry attacking the use of airplanes and missiles in modern warfare. The N.C.A.A. is not power grabbing as charged by the A.A.U. They only want to be heard on matters that directly concern them and their member institutions. They feel the best way to accomplish this goal is by joining with other national organizations in the joint Federations.

Most people feel that the United States should select the best representative team for any international competition. This has not been the case in the past, and is exemplified by the United States versus Russia basketball series last Fall. Under present conditions, this end can best be achieved through the Federations' structure and ideas. Their interest is in seeing their individual organizations excel.

There have been two agreements already reached by the two groups. On October 26-27, 1962, in Washington, D.C., the so called Washington alliance was reached. At this time the delegates agreed to a plan where they would work in harmony for the immediate future. A meeting was scheduled in New York for November 12, 1962, to ratify this agreement. At that meeting the A.A.U. reversed its decision and rejected the Washington alliance. The Attorney General of the United States appeared at this meeting and through his efforts a coalition plan was formed involving the U.S.T.F.F. and the A.A.U. This coalition was in turn rejected by the A.A.U. at its Detroit, Michigan convention held on November 29, 1962, through December 1, 1962.

The U.S.T.F.F. has no choice except to proceed as fast as possible with its program, providing competition for all ages. The A.A.U. in turn has threatened suspension of athletes who compete in a Federation meet. According to a N.C.A.A. report of December 8, 1962, there is nothing in the rules of the International Body governing track and field which suggests or requires the A.A.U. to rule an athlete ineligible for competition in an American amateur sports event not approved by the A.A.U. This is an internal decision of the A.A.U. of the United States.

The officers of the N.A.T.A. would like to take this means to urge all members whenever possible to assist the National Federations in their endeavors. We hope that all of the members will act as spokesmen for the future of amateur athletics in the United States through the National Federations.

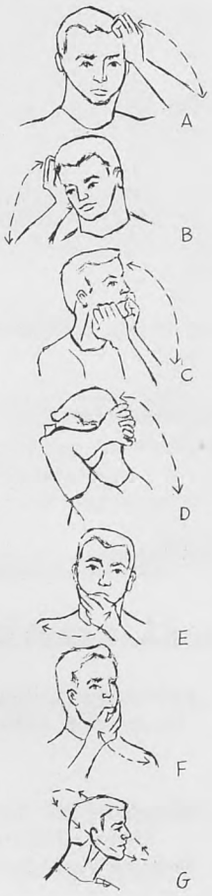
The Editor.

NECK EXERCISES USED BY THE OHIO STATE UNIVERSITY

By E. R. BIGGS,
Head Trainer

NECK EXERCISES

1. Tension, Self-resistance



a. Hold left hand against left side of head. Attempt to touch ear to left shoulder, pushing against head with left hand. Do five times.

b. Reverse (a) to right side. Do five times.

c. Place both hands on back of head. Attempt to push head to the rear while resisting with both hands. Repeat five times.

d. Reverse (c) to front. Repeat five times.

e. Rotation. Place left hand on right side of lower jaw. Attempt to turn head to the right and place chin on shoulder resisting movement with left hand. Repeat five times.

g. Circumduction. Tense all muscles of neck and move head in complete range of movement; first in clockwise motion and then counter-clockwise. Repeat five each direction.

2. Traction and Weights.
   a. Perform all movements listed under tension exercises No. 1 above.
3. Bridging
   a. Forward - Backward. Both with and without helmet.

"FOOT-ANKLE" INJURIES IN BASKETBALL

"Sprained" Ankle — A FOOT PROBLEM?

What Structures are Involved?
Where is the Specific Damage?
When can the Boy Safely Return to Action?

DR. CHARLES A. ROBERTS,
Director—Children's Foot-Posture—Foot Balance Clinic,
Sherman, Texas

Coaches are confronted with the ever increasing foot and ankle problems of athletes. Boys with great DESIRE and ample latent ABILITY fail to achieve the anticipated goal set by the coach. Many times the fault lies in wrong foot posture and foot balance, both of which provoke ankle problems.

What is meant, what is being described, when the statement is made, "the boy is out of action because of a sprained ankle?" The ankle is defined in Taber's Cyclopedic Medical Dictionary as: "The part between the foot and the lower end of the leg." In the Thorndike-Barnhart Concise Dictionary as: "Joint that connects the foot and the leg." A very limited area described as the "Ankle."

Each sport seems to have a prevalent potential site of injury. In basketball it is the "foot-ankle" area. Continuous, positive control of the rear foot structures can prevent the majority of "foot-ankle" injuries so common to basketball players.

By *continuous control* we mean "daytime" as well as "play-time." By *positive control* we mean specific stabilization which will prevent abnormal stress, strain and excessive movement of the structures in the "foot-ankle" area.

During the past ten years the Children's Foot-Posture—Foot-Balance Clinic in Sherman, Texas,[1] has conducted continuous investigation of all types of "foot-ankle" area injuries in athletics, with special emphasis on basketball. Our first consideration was—why did the injury happen? Our conclusion is that most basketball "foot-ankle" injuries are the result of poor postural relation between the foot and the leg with the resultant imbalance of the intrinsic leg muscles which have their insertion in the foot. A secondary problem is poor tonicity of foot muscles which are unable to cope with the sudden and strenuous special action demands of the game.

Basketball season always produces its share of ankle problems. Continuous investigation into this area over the past ten years shows that the problem is increasing. Contributing factors are: More riding, less walking, continuous existence on hard flat surfaces, less bicycle riding, weak poorly constructed footwear worn during the day which do not give adequate protection to foot and ankle structures. (A survey made by the Children's Foot-Posture Clinic of a High School team showed 19 wearing footwear without counters and with weak shanks—only one boy was wearing oxfords—18 were considered fitted short.) Inadequate "daytime" footwear is undoubtedly, a major contributing factor to chronic ankle and foot problems. Until this can be brought to the attention of the parent, the boy, the coach and the trainer and in some manner corrected, foot and ankle problems will continue to plague them all. Of the four major classifications of ankle disability three are created by or aggravated by weak, incompatible "day-time" footwear.

"Foot-Ankle" Injuries Not Accidents

Far too many "foot-ankle" area injuries are classified as accidental. The real fact is, they are structural failures under stress conditions. This compares with any exhaustion stage—out of breath—toxic fatigue—muscle cramp due to lack of oxygen replacement—any failure or lack of response which stems from poor conditioning, often the precursors of injury.

Our studies indicate that "foot-ankle" area injuries are on the increase. These injuries are undoubtedly associated with urban living—less walking, more riding, existing on flat surfaces which are not compatible with foot and leg development. The intrinsic foot and leg muscles of the city dweller are generally weaker than those of the country boy. Unless some special conditioning program is developed for feet, ankles and legs and incorporated into the athletic program, we predict an ever increasing number of lower extremity and low-back problems for the athlete. When poor conditioning or underdevelopment is a factor, protective measures take on added importance.

Sprained Ankle?

It would seem that the term "Sprained Ankle" is very loosely used in athletic circles, in fact, by the public at large. Recovery and return to activity is definitely limited to an accurate evaluation of just what has happened to the boy. Unless more specific knowledge is gained about the structures involved, management of ankle injuries will remain evasive, recovery will be slow, and the future usefulness of the part unpredictable.

Consideration of the ankle without regard to the foot and leg structures is incomplete and unscientific. A basic knowledge of the anatomy in the lower extremity is imperative in order that the physiology, mechanics or pathology of the foot and ankle can be understood. A careful check of the muscles and their tendons which originate in the leg and terminate in the foot disclose a close relationship to ankle function as they pass through the ankle area. A study of their relationship to foot bones adds definition to the search for initiating causes of ankle problems.

The management of an ankle injury is often related to the leg muscles and their tendons and the manner in which they control certain foot bones. Leg muscles are responsible for the major ankle motions, extension and flexion (the only motions allowable in the ankle mortise). Leg muscles do not enter the foot. They end in long,

Continued on page 4

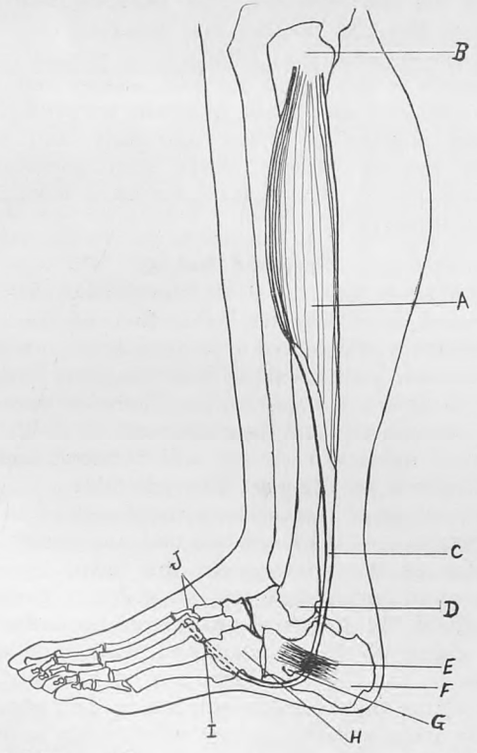
"FOOT-ANKLE" INJURIES (Continued)

strong, inextensible tendons which enter the foot. The course taken by the tendons are well charted, their action on foot bones determine, to a great extent, foot action and foot equilibriums. Feats of strength and agility cannot be performed by feet that are in poor postural relationship to the leg.

Common Site of Injury

In the opinion of the author, there are four distinct structural injuries in the ankle-foot area where the primary site is not in the ankle proper.

The first, and possibly the most common, site of acute injury in the ankle-foot area occurs on the lateral side of the *calcaneus* (heel bone). The gross anatomical involvement is in the *lateral crural muscles* of the leg and their tendons which terminate in the foot. The *peroneus longus* (A) is the largest of the lateral crural muscles. It arises from the fibula (B); it ends in a long tendon (C) which passes behind the *lateral malleolus* (D) in a *groove*; the groove is then converted into a *canal* which runs behind the *superior peroneal retinaculum* (E) Def.—"A retinaculum is a band or membrane holding any organ or part in its place."; the tendon extends forward across the lateral side of the *calcaneus* (F) passing below the *trochlear process* (G); it crosses the lateral side of the *cuboid* (H); the tendon then crosses the bottom of the foot obliquely (dotted line) (I) and is inserted into the lateral side of the base of the *first metatarsal bone* and the lateral side of the *first cuneiform* (J).



Any sudden, violent excursion or turning of the foot outward places terrific strain at the points where the tendon of the peroneus longus changes direction (E) (G) (H). Usually the belly of the muscle is well developed and strong—stronger than the pulley like structure at (E) where the *ligamentous retinaculum membrane* is separated from the bone. Occasionally the *periosteum* of the bone will be damaged. The trochlear process can be fractured, but this is believed to be rare.

The usual sequence of events is somewhat as follows: The boy experiences a sharp pain which may be accompanied by a cracking or popping sound, the pain may be fleeting or it may be constant; he starts favoring the foot; when interrogated by the trainer or coach, he says, "I turned my ankle." In this instance the injury is not in the ankle proper—it is on the side of the heel bone.

Cardinal Signs and Symptoms

Depending, of course, upon the extent of the damage the usual reactions are: swelling, edema, extravasation, discoloration, pain on flexion, most of which occur later, perhaps the next day following the injury. Many times the pain will subside or completely stop within a few minutes. The boy declares that he is OK and wants to reenter the game.

Before renewed effort all tests and precautions should be taken to rule out a possible fracture—this is difficult without fluoroscopy or x-ray examination of the part. If a normal range of flexion, extension, adduction, abduction and circumduction can be accomplished actively and passively, usually a fracture can be ruled out. (Note: nothing is certain except radiography from all important angles.)

In any event, the boy should not be allowed to play without first applying some controls which will protect the part from further damage. Osgood gives three rules to be followed, viz.: 1. Be sure the sprain is not a fracture. 2. Determine the exact anatomy of the lesion by ascertaining the method of production and its mechanical necessities. 3. Protect the torn ligament or ligaments and allow immediate function. Lewin states: "Very gentle massage should be started early and active motion should be encouraged as soon as the patient will permit it."

Management of Peroneal Retinaculum Injury

If motion and immediate function are indicated, an occlusive, rigid cast or wrapping is contraindicated. Any control applied to the injured part must allow flexion and extension and limit medial lateral motion of inversion, eversion, abduction and adduction. The dorsum (top) of the foot and the Achilles tendon should be left open to allow ample circulation into and out of the foot. The main *arteries* are the *dorsalis pedis* on the top of the foot and the *posterior tibial* which runs down the back of the leg and feeds the medial, lateral and plantar structures of the foot. The posterior tibial artery also has branches that feed the *peroneal* structures. The *veins* which carry off the waste material from the injury follow about the same course emptying used blood into the *saphenous veins* of the leg. When properly applied, any form of control should have a pumping, milking action which will assist in the removal of waste products of an injury, thus accelerating the healing processes.

Tension and strain must be removed from the focal point of injury. This is done by making certain that the bones in the rear foot assembly (heel, cuboid, and talus) are held firmly in their proper postural attitude and not allowed to pronate or to sag. In combination with a rear foot control and long circular straps, much of the strain is removed. The straps follow the course of the *peroneal* and *tibial* muscles. The control is placed well back under the center line of body weight and held by the straps which also are placed well back under the heel bone. This becomes a stirrup type of protection and, what is of real importance, allows and encourages proper function. It also holds the foot in good postural alignment with the

Continued on page 6

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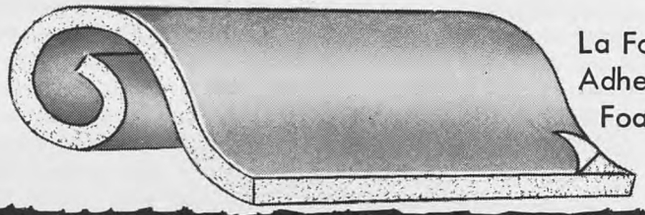

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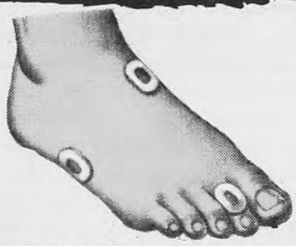

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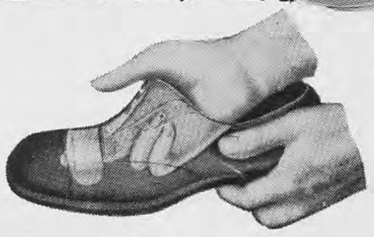

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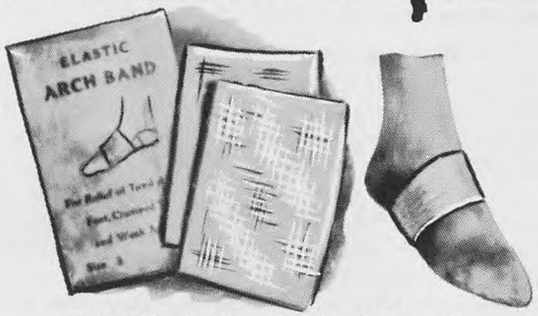

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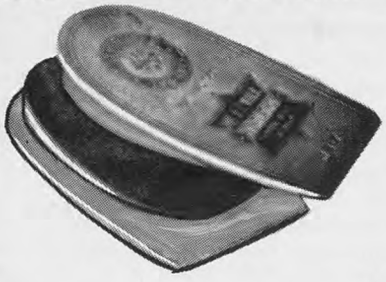

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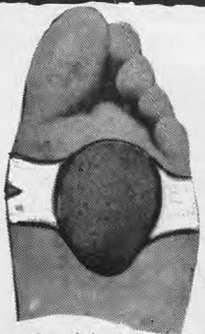

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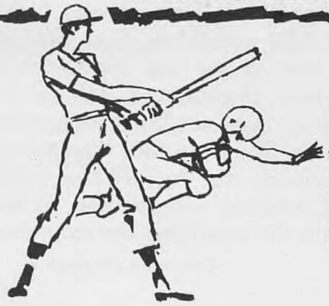

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"FOOT-ANKLE" INJURIES (Continued)

leg bones. (See article in March, 1962 issue of Texas Coach.)

After the rear foot control and straps are applied the boy is then told to walk, in a straight line, toes straight ahead or slightly "pidgeon toed," taking very short steps, in rhythm, without limping. This rhythmic cadence is increased, also the length of the stride as pain subsides. Because of its importance, the posture of the foot on the leg must be emphasized to the boy—the foot must be straight on the leg, or slightly toed in. When pain is at a minimum a slow jog is started, same foot posture, same rhythm, in a straight line. (Turn corner square if working in a limited area—never walk or run in a circle if foot or ankle problems are present, especially acute ones.) The stride may be lengthened as permitted. After a period of absence of sharp disabling pain, the boy can be allowed to drive and jump.

Barring fracture, extensive tearing, rupture of structures, or crushing traumatic blow, the boy is better off in action than sitting or lying down. Heavy flexible or rigid casting is not indicated where movement and immediate function are desirable. It follows that positive controls and protection are necessary for the rest of the season and many cases require protection for much longer periods of time. Chronic conditions, where the injury has been repeated on several occasions, require controls in "daytime" footwear as well as in "play-time" footwear. No permanent recovery and return to normal use can be anticipated if the part is irritated by continuous strain during the long hours of the day. This is an area which needs a lot of study and investigation in athletics.

The Cuboid Lesion

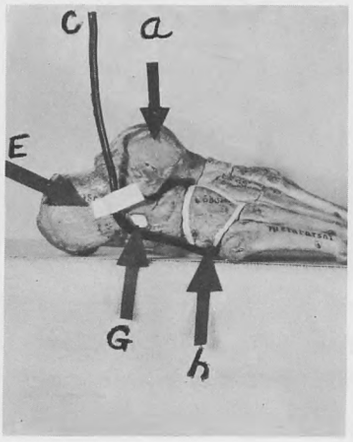
Any comprehensive study of "Ankle" injuries associated with athletics should include the *cuboid lesion* as a specific problem in the "Foot-ankle area." The term "Sprained Ankle" is general terminology and is sometimes used when a more specific injury location should be designated through careful physical diagnosis. There are several reasons for precision findings since management will vary, different recovery periods are involved and the return to action may be accelerated. The exact site of the "Foot-ankle" injury should be pinpointed whenever possible and a regimen of rehabilitation selected which will produce maximum results in the shortest period of time with the minimum residual effects.

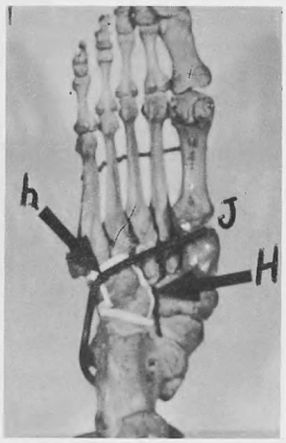
The generally accepted methods of treating a "Sprained Ankle" include various forms of immobilization and long periods of inactivity. There are at least four injuries in the "Foot-ankle area" which require function as a definite and important part of treatment. Active and passive tests may be made by the coach or trainer which will help in making a decision as to classification and the best immediate care of the injured part.

One of the common injuries in the "Foot-ankle area" is a rotated (subluxed) *cuboid* bone. The *cuboid* is located on the lateral (outer) side of the foot just ahead of the *calcaneus* (heel bone). It articulates with the *calcaneus,* the *external cuniform* and the proximal ends of the 4th and 5th *metatarsal* bones. The *cuboid* is the keystone of the outer weight bearing segment of the human foot. The maintenance of its proper anatomical relationship with other foot segments is of great importance to ideal foot function.

(Illustration 1.) The tendon of the *peroneus longus* (C), passes behind the *talus* (ankle bone) (a), it then enters the *canal* which runs under the *superior peroneal retinaculum* (E), it continues behind and below the *trochlear process* (G), then runs forward to the *sulcus* of the *cuboid* (h) where it makes a sharp turn under the *cuboid,* (H). (Illustration 2.)

(Illustration 2.) The *peroneus longus* tendon crosses diagonally under the *mid-tarsal* segment of the foot and inserts into the base of the 1st *metatarsal* and 1st (internal) *cuneiform* (J).





An excessive outward rotation of the foot—an overstress landing on the toes or a combination of these two stress motions, beyond the range of normal motion, threaten the stability of the *cuboid bone.* In excessive outward foot rotation stresses are present at (E) and (G). If these hold the stress is concentrated at (h) where the tendon crosses under the *cuboid.* This pulley like action exerts an upward motion which may rotate the *cuboid* on its long (anterior-posterior) axis.

If, following this type of foot strain, the *cuboid* does not return to its normal position, immediate pain results on weight bearing, especially weight on the toes. The circumstances of the injury may all indicate "ankle sprain." The problem, however, is not in the ankle—it is in the foot. The *cuboid* is subluxed (partial or incomplete dislocation)—symptoms are similar and the tendency is to treat a "Sprained ankle." With all of the bones in the sub-talar and mid-tarsal segments disorganized, it is possible that one or more nerve branches are impinged causing severe pain on weight bearing.

Management of a Cuboid Lesion

As recommended in all "Foot-ankle area" injuries, immediate examination is made of the bare foot. It is best to have the subject supine (lying on back) on a seven foot padded table. Any examination should be made with the body as relaxed as possible from head to heels. Both extremities should be on the table—it is most important that the heels be resting on the table. (Illustration 2.) Slight thumb pressure at (H) usually produces pain—forceful flexion of the foot on the leg may also produce pain. Testing is conducted in two parts—active and passive motion. With the subject relaxed have him actively (with no aid from the examiner) fully extended, flex, abduct, adduct and circumduct the foot on the leg. Occasionally as this is being done the *cuboid,* if subluxed, will return to its proper place. This may or may not be accompanied by a "popping" noise in the area. The examiner then grasps the heel firmly slightly elevating the leg off the table. (Make certain that the leg muscles are relaxed to the hip and the knee locked). With the free hand the examiner

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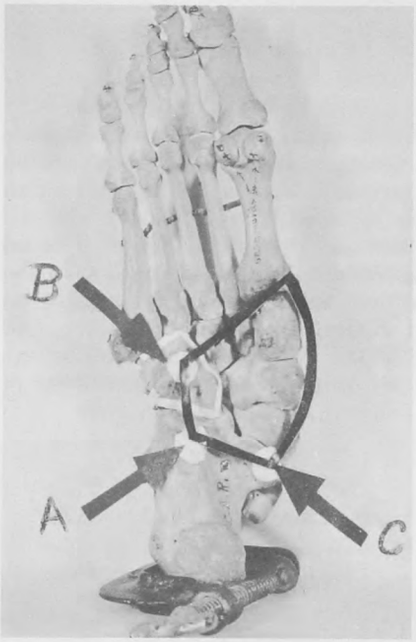
"FOOT-ANKLE" INJURIES (Continued)

vigorously, passively, performs all of the foot motions described above. Regardless of the fact that the structures may have aligned themselves while the subject was actively moving the foot, the passive motions are done to test for pain reactions and to further normalize structures and functional values.

After ideal function is restored and the acute pain relieved the part must be protected and recurrence prevented by the use of a specially designed Rear Foot Control. The control has skived edges and elevations and the placement is critical. The control is cemented to the foot and when properly placed, weight bearing pressures, on specific structures, align the rear foot assembly. Additional protection and security is accomplished by circular straps. (Illustrated in the March, 1961 issue of Texas Coach.) The position of the Rear Foot Control and some additional anchor straps are illustrated in the March, 1962, Texas Coach, page 32. Under ordinary conditions the subject can return to action immediately after the control and straps are applied. Usually there is very little pain and no further damage anticipated in the area. Complete recovery can be anticipated if the involved structures are held in good alignment when the foot is weight bearing. This means strong "day-time" footwear that does not sag under the *cuboid* area. (Ref. page 30, Texas Coach, February, 1962.)

Structures to Control
Illustration 1

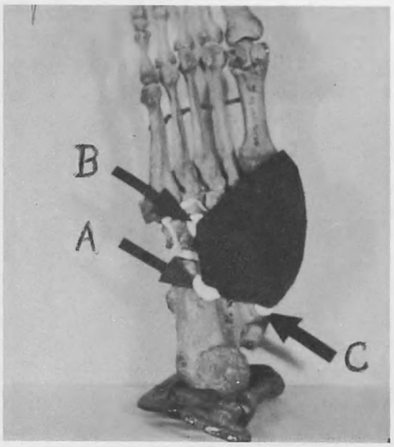


A.—the *anterior-inferior* portion of the *oscalcis* (heel bone).

B.—the *medial* shelf of the *cuboid.*

C.—the *media-superior shelf* of the *oscalcis, (sustentaculum tali).*

Illustration 2. The placement of the Rear Foot Control is important. It is designed to control specific foot structures.



Specific Areas of Involvement
the High Arch

The "high-arched," (pes-cavus) type of foot is in continuous strain when operating or standing on flat surfaces. This is the type of foot that presents many problems in athletics. Upon casual examination this type of foot looks good and one would suppose that it would stand up under hard work and that it would give its owner very little trouble. In a good many cases the facts are just the opposite.

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"FOOT-ANKLE" INJURIES (Continued)

Figures 1 and 2 show the typical "high-arched," pescavus type of foot. Figure 1 shows the weight bearing aspect and figure 2 the non-weight bearing. In describing this foot in its gross morphology many irregular surfaces are observed. Specifically pointing out a few irregularities: on the medial border of the right foot a bulge extends from underneath the medial malleolus to the hallux, directly under the hallux of this same foot the bulging pad which emerges at the weight bearing area, at the rear portion of the right foot a considerable hollowed out place directly back of and below the malleolus, a considerable bulge around the bottom, weight bearing edge, of the heel. All of these are cardinal signs of strain in this weight bearing foot. On the left foot on the outer border: a definite prominence along the shaft of the fifth metatarsal bone which begins just ahead of the cuboid and extends to the distal end of the bone, a prominent bulge on the dorsum of the foot which has the appearance of a general swelling, as in the right foot the deep hollow below the lateral malleolus and the bulging of the fatty pad around the bottom of the weight bearing heel.

Figure I

Figure II

The results of excessive pressures are exhibited in figure 2, heavy callosities have formed under the hallux of both feet, both are nucleated and painful to the owner. Heavy callouses at the heads of all metatarsals, especially the second and third, mean that this area of the foot is also carrying excessive weight. (This fact was attested to by high readings on the inner border of the foot on the Foot Balance Indicator.) Although it is difficult to tell from the photograph, there are heavy callouses developing around the edges of both heels. The dark shaded areas on the bottom of the foot show weight bearing areas that receive the brunt of foot pressures in jumping, running and walking on flat surfaces. The lighter areas just back of the heads of the metatarsals and on the inner border of the foot show the areas which have not been receiving any weight at all. It is interesting to note that these areas go almost to the outer edge of the foot. This shows that there are large areas on the bottom of these feet which do not carry weight, smaller areas that are weight bearing.

Most every coach who has looked at the bottom of the feet of his athletes can recall seeing this very type of pattern of weight bearing including callouses, etc. The trauma and strain which is generated in this type of foot, if it could be computed, would add up to hundreds of tons of weight thrust during the period of any game. Add to this the continued trauma of every day walking and other activities. For example in basketball the hours of practice on hardwood floors, running, back-boarding, sudden starts and stops, may develop real foot disability in the athlete with the "high-arched" foot.

Usually when these athletes present themselves to the coach or trainer with trouble, the outward appearance of the foot is that of one that has been sprained. The boy usually reports following the turning of an ankle or a traumatic injury which caused pain to develop in the area. When subjected to a range of motion greater than that used in normal activity, it becomes difficult for this type of foot to recover quickly. Pain, slight swelling and the extravasation of fluids take place exactly as in the case of a badly sprained ankle. It is very difficult for the coach or the trainer to differentiate between an ankle sprain, a strained foot that has suddenly come to the point where it cannot tolerate continuous trauma or the common rotated cuboid—all have about the same cardinal signs.

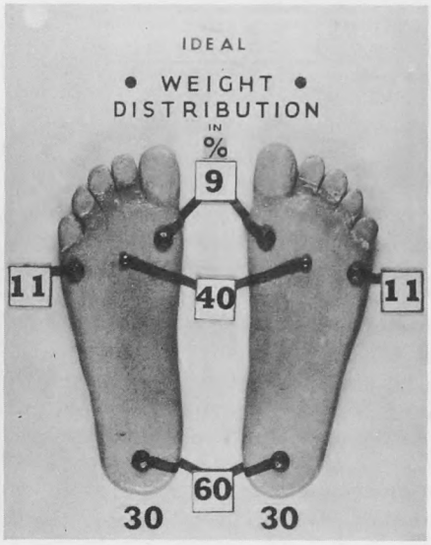
In any event the quickest road to recovery is rest for those parts which have been under constant or acute trauma.

Although our experience has been that this type of rear foot control is most effective in the high-arched pescavus type of foot, it has also been used in all strained and weak foot conditions with satisfactory results. It goes without saying that the cooperation of the boy is essential. The complete recovery is dependent upon eliminating, as near as possible, all of the traumatic injury which takes place when the foot is not properly balanced or is in a poor functional atmosphere as far as the fitting and the construction of footwear is concerned.

Trying to classify foot-ability and foot-efficiency by looking at the height of the inner arch of the foot is very confusing and inconclusive.

Foot Balance

"Ideal" foot balance in the erect, knee locked, position has been established as follows: 1. Approximately the same amount (one-half of the total body-weight) of weight on each foot. 2. More weight on the heels than on the toes (sixty percent on heels, forty percent on toes). 3. The weight on the forefoot shows a tendency for the outer segment (metatarsals 3, 4, and 5), to bear more weight than the inner segment (metatarsals 1 and 2). The cardinal rule is that each foot must carry its equal share of the total body-weight. "If, when standing in the knee locked, erect position, there is excessive weight on one foot, as compared to the other, both feet are out of balance. In such case "Ideal" Isoropo (body equilibrum) cannot be established and maintained."[4] Roberts' Law of Isoropo.



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Announcing

This is a new Bike service in the cause of athletic injury prevention and care. It will provide the following assistance to the athletic profession:

Financial Grants-in-Aid, not to exceed $1,000 each, to be awarded for the purchase of training room supplies and equipment, to selected schools who meet the qualifications established by the Trustees.

Counsel by professional athletic trainers, who will help you set up and equip a training room for your school. This staff of experts is at your service.

The following Bike services are also available upon request:

THE BIKE CIRCULATING FILM LIBRARY: An authoritative series of 16MM sound movies, showing the best ways to prevent injuries to ankles, muscles and athletic injuries generally. In these films leading trainers and team physicians demonstrate the most widely used and approved techniques.

THE BIKE SPORTS TRAIL: A lively monthly news-letter mailed to over 40,000 coaches, trainers, and other interested groups. Each issue dramatizes intelligent actions that help you strike at the heart of the injury problem.

THE BIKE CENTURY CLUB now lists as members over 1100 coaches who have won this award for leading their teams to 100 or more victories in any sport. Each member elected receives a handsome certificate attesting to this fact.

For details on how to benefit by any or all these BIKE activities, write Mr. D. L. Thomas, Secy.-Treas., Bike Training Room Foundation, 309 West Jackson Blvd., Chicago 6, Ill.

BIKE®

THE KENDALL COMPANY
BIKE SALES DIVISION

"FOOT-ANKLE" INJURIES (Continued)

Our interest in the foot-ankle problems of the athlete has disclosed multiple problems in feet, ankles, knees, legs and low-back, directly caused by or aggravated by poor distribution of body-weight in the feet—poor body equilibriums—poor *Isoropo,* which affect the performance of the athlete. Leakage of available energy, lack of co-ordination, loss of accuracy, these and many other problems may be attributed to poor *Isoropo.* Body equilibrums are maintained through a series of controlled physiological efforts. Errors caused by a lack of compensation for anatomical and physiological anamolies are costly to the athlete. Asymmetry may be, and often is, compensated for so effectively that malfunction can not be elicited. It does not follow that the body is free from stresses and strain, however, continued misuse is accumulative up to and including chronic, painful stages.

Balance Is Important

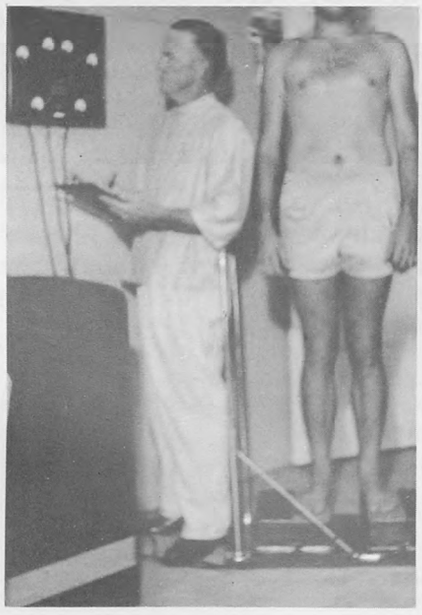
The importance of balanced wheels, balanced diets, balanced budgets is common gnowledge. Balance is a prerequisite to smooth, trouble free mechanical performance in any machine, this includes "man the machine."

In summarizing, body equilibrums (Isoropo) are created by balancing two opposing forces, body-weight VS gravity. Equilibrating the human body releases tension, stress and trauma in the feet and throughout the entire body; conserves available energy; improves co-ordination; increases accuracy, agility and speed in the athlete.

In future issues we will discuss many specific *Isoropo* problems which will be of interest to coaches and trainers of athletes.

Foot Stresses and Strains

Foot stresses and strains are magnified in direct proportion to poor foot balance, poor foot posture and poor foot alignment. This situation creates foot imbalance which can be detected with proper mechanical tests. (Tests made by the author and associates in the Children's Foot Posture—Foot Balance Clinic were made on an instrument of precision called the Foot Balance Indicator which was invented by the author and patented in 1932.) If feet "toe out" (abduct), there is unusual torsion and stress at the ankle mortise. The ankle bone (talus) is set between the malleoli on the distal end of the tibia and fibula. The motions at this joint are limited to extension and flection, a hingle like motion (ginglymus). Stress, strain and torsion not in line with free joint motion stretch and weaken all joint structures. Constant improper use of the joint creates chronic traumatic injury in the ankle assembly with accompanying swelling and soreness.



Stresses and strains in feet and ankles are radiated to the knees, hips and back. Poor foot alignment and poor foot balance start a chain reaction which can slow down the action and effectiveness of any athletic endeavor.

MAKING FOOT BALANCE TEST— CHILDREN'S FOOT–POSTURE, FOOT BALANCE CLINIC

Ankle Disability Management

In chronic cases, we advise the use of the balanced, molded rear foot control in combination with continuous "day-time" protection in strong lace oxfords. Footwear which sags or twists under the body weight thrust is a hazard to prevention and rehabilitation. One great advantage in basketball shoes is the wedge type of full length even platform. "Day-time" control under the cuboid in chronic conditions in the "Foot-Ankle" area is essential since it eliminates strain during the long hours of the day. (Refer to page 31 Texas Coach, February, 1962—"The thumb test.")

In some manner those who are responsible for the physical wellbeing of the athlete, must learn how to classify and evaluate day-time footwear as they do play-time footwear. The accumulative effects of poor foot-posture and poor foot-balance are fatigue, loss of available energy and acquired faulty postural attitudes, all of these lower total-ability. Mediocre performance and ineffectiveness of effort is the end result.

The management of any combination of errors in foot-posture, foot imbalance and the lack of muscle equilibration must start with the alignment of the heel bone. Unless the heel bone is held in an optimum position structures on top and ahead of the heel bone cannot be aligned and equilibrated. If the front end of the heel bone is depressed (see figure 4, white arrow), the ankle bone moves downward and inward distorting the ankle mortise.

Depression of the anterior portion of the oscalcis starts serial changes in the *sub-talar* segment altering foot-posture and foot-balance. Failure of footwear under the cuboid unlocks the *mid-tarsal* segment which effects anterior-posterior distribution of body weight. Medial rotation of the heel bone is followed by *ankle valgus, pronation, eversion* and *abduction.*

Any change in the control of the heel bone which involves the raising of the front end must be done with direct pressure on the bottom of the foot. Considerable success has been attained through the use of a diamond shaped control properly scived on all edges. The placement is critical in relationship to the front of the heel bone and the shelf of the cuboid bone which is located on the lateral side of the foot just ahead of the heel bone.

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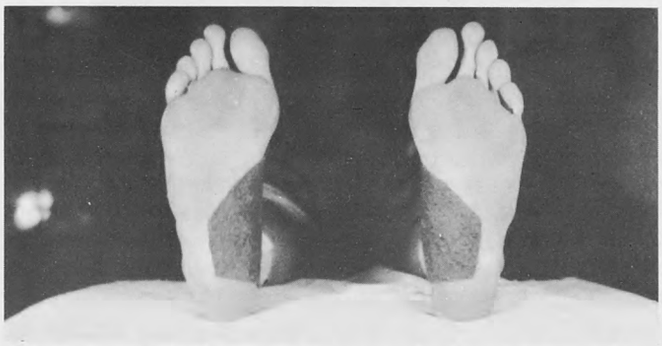
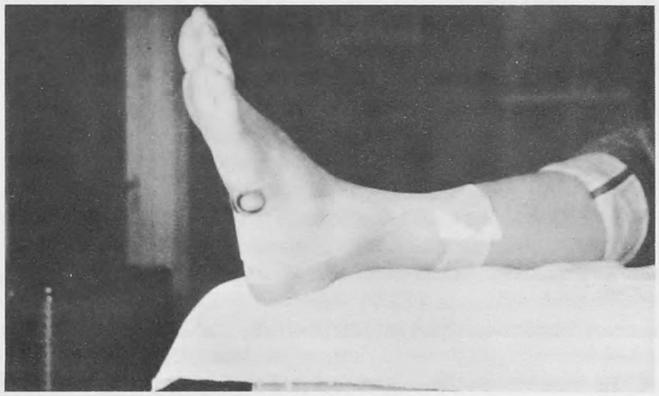
"FOOT-ANKLE" INJURIES (Continued)



A general knowledge of anatomical relationships of foot structures is necessary for effective placement of the Rear Foot Control on the bare foot. The control is placed well back on the heel for positive elevation of the heel bone. The shelf of the cuboid is usually about an inch from the outer margin of the foot. By placing the straighter of the two long sides of the control well back on the heel, the pressure of the control at the sustentaculum tali and against the medial border of the heel bone is positive.

The rear foot control is secured by spiral type straps. (See figure 6). They start on the front of the leg, continue over the ankle joint and are well back on the heel. They are laid on without tension with the boy completely relaxed with the foot lined up with the shin bone. As the strap is wrapped around the outer heel make certain that the strap does not pass over any part of the tuberosity of the fifth metatarsal bone. Any pressure on this prominence will defeat a part of the intent of the control.

The spiral strap may be of various lengths. They act as muscle stabilizers as well as for holding the control securely in place on the foot. In this connection the use of quick drying liquid rubber cement on a smooth shaven leg decreases the chances of the control shifting. This material is non-toxic and it offers a superior adhesive base for strapping. The bigger the boy the longer the strap, seems to be a good rule. Anchor straps placed about two inches above the ankle and at the top of the straps work best if a stretchable adhesive is used—regular tape will break with muscle expansion.



One distinct advantage of the rear foot control with spiral strap is the freedom of extension and flexion movements. By leaving the top of the foot and the achilles tendon open blood supply via the dorsalis pedis and posterior tibial is not restricted. Of major importance is the fact that the boy continues to work without fear of further damage to the injured ankle structures. The control and strap have a massaging, pumping action which tends to

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"FOOT-ANKLE" INJURIES (Continued)

reduce swelling and eliminate waste materials in the area. It is not unusual for swelling to subside while the boy is working.

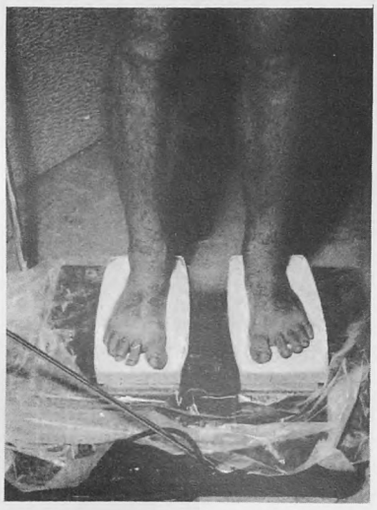
It is advisable to use the control on both feet even though only one is involved. This prevents any postural imbalance from developing and actually strengthens both feet.

Preventing Foot-Ankle Problems

Preventive measures are not new in athletics. Though the years dozen of items have been developed which reduce the hazards of every game. Many of the protective devices are mandatory if the athlete expects to participate in the sport. Diets are controlled, training regimen followed, suggested more of living, all intended to improve health and performance. Rigid rules designed to carry the athlete through a contest at top speed, add endurance and reduce chances of injury. Why not provide adequate, positive protection for the "foot-ankle" area? Why should the protection and conditioning of this very important part of the basketball players physical equipment be left to chance?

Chronic "Foot-Ankle" area problems that do not respond to usual management and strapping, have sidelined many good boys. The Balanced Functional Footwear Laboratories[2] have perfected a balanced, molded Rear Foot Control which has proven most effective in these cases. Weight bearing foot casts are made on the Foot Balance Indicator with the body weight ideally distributed on both feet.–Ill. 6. A positive mold is made from the original weight bearing, balanced cast and the control is fabricated over the positive mold–Ill. 7. The molded Rear Foot Control can be made full length or ¾ length–Ill. 8. (More detail of the construction of the molded control is given in the Texas Coach issue of August, 1961–"Development of a Rear Foot Control.")

The full length control is used in cases of anatomical leg shortages. If an elevation is required to level the pelvis and equilibrate the body, it is recommended that the elevation extend from heel to toe. Shortages are not uncommon–there are no paired structures in the human body that are identical–asymmetry being the rule, rather than the exception. Any appreciable difference in leg length can be a real handicap to an athlete. Usually the long leg accepts a greater weight load–this can cause pronation, eversion and abduction on the long side. Serial changes take place in the "Foot-Ankle" area, radiating up into the knee and low-back. Leg shortages are associated with many unilateral problems in the lower extremities, certainly in the low-back. Posture deviations, including all types of curvatures are often induced and aggravated by differences in leg length.



NOTE: If the reader does not have the Texas Coach articles referred to–copies may be had, free of charge, by writing Children's Foot-Posture-Foot-Balance Clinic, P. O. Box 913, Sherman, Texas.

CARING FOR THE EMOTIONS OF HIGH SCHOOL ATHLETES

W. HUGH MISSILDINE, M.D.

Associate professor, Department of pediatrics, and assistant professor, Department of Psychiatry, Ohio State University

Reprinted from the *Ohio State Medical Journal*, August, 1961

The team physician should safeguard the emotional as well as the physical well-being of his athletes. The feelings of the individual boy have to be understood and properly channeled in order for the athletic program to do its work in furthering the boy's personality maturation.

In itself, participation in athletics aids the maturing process. The experience of subordinating one's individual aims to the team effort, of "taking the bumps" to reach a desired goal, of feeling the deep friendships that develop when, with others, one goes through hard, mutually shared events–all contribute to healthy personality growth. The team physician must make sure that the natural forces in athletics exert their growth promoting effects without influences which hinder those forces.

Team Attitude Atmosphere

A healthy team attitude atmosphere is the responsibility of the coach. However, the team physician can often sense difficulties in attitudes and advise the coach on their solution. A healthy team attitude is one of mutual respect. When each member of the squad is respected in his right work on the masteries of his position and is limited firmly when he infringes on the school or team goals, the rights of the coach or the rights of other team members, the team is in a healthy mutual respect balance.

The Coach-Team Relationship

The coach must respect his own right to teach and to set firm limits when this right is interfered with. He must respect each of his boys as dignified individuals and must know them as well as the homes they come from. He must be firm when his rights, the rights of team members or the

Continued on page 13

CARING FOR THE EMOTIONS OF (Continued)

goals of the team are jeopardized. He must never belittle. He must be willing to listen when a player needs to talk to him. A mutually respecting team feeling must be initiated and maintained by the coach.

Frequent Personality Types and Their Handling

The Impulsive, Oversubmitted-To Boy

This type boy is often a skilled, well coordinated athlete. He does things easily and with little effort. However, he wants to do things his way and has difficulty taking direction. He loses his temper easily. He will attempt to shine personally regardless of the goals of the team. He is often not punctual and tends to break training rules. He often exploits and has little regard for the rights of others. Such a boy usually comes from a home in which he has been waited on and his whims and demands submitted to. Those around him at home have not insisted on their rights in living with him. This boy will need swift, firm limits as soon as he breaks rules or disregards team goals or the rights of others. Leniency to keep the peace or special privilege "because we need him" works against his development and that of his teammates.

The Self-Deprecating Boy

He will strive hard and practice much, but he will cut down his performance by his own self-belittling and distrust of his capacities. He will worry excessively before every game and feel sure he will not do well. He will be crushed by the slightest criticism. Often his self-belittling will hamper his efforts, he will make mistakes, and this will bring on more self-reproach—a vicious cycle. This type of boy often comes from a home where his performance or personal characteristics have been belittled or excessively criticized. He needs to have firm, immediate limits placed on his own self-criticism: ("I don't allow talk like that about a member of this squad, and you're a member of this squad"). He needs frank, but brief recognition when he does well and brief, noncritical reassurance and review when he makes a mistake. He is to feel that his worth as an individual does not depend on each recurring performance.

The Hypochondriacal Boy

This boy magnifies each minor ache and pain. He spends much time reciting his physical woes to the team physician and frequently misses practice because of some mild ailment or disability. He usually comes from a home where undue attention has been focused on bodily aches and pains. His difficulties will increase if his complaints are ignored, ridiculed or catered to. He has to be encouraged to carry on even though he is suffering. He is to be praised every time he carries on with complaints, since it is harder for this boy to carry on under these circumstances than it is for the ordinary boy.

Call In The Boy's Parents

On occasion the boy's parents can be called in so that they can cooperate at home with the principles that are being used with him on the athletic field. Attention to these details will not only increase team morale, but will help these young persons use athletics to achieve their own personal maturity.

ST. LAWRENCE TRAINER HONORED

One of the true veterans of his profession and an important contributor to the successful athletic program at St. Lawrence University, Canton, New York, is trainer James W. "Doc" Littlejohn, Jr. Doc celebrated twenty years at SLU last summer. He has rolled up more tape milage and healed more athletic injuries than any man in northern New York.

Typical statistics on Littlejohn's pre-season football order forms might list: two gallons of rubbing alcohol; 25 pounds of foot powder; two gallons of liniment (for aching muscles); 50 pounds of cotton; 75 pounds of ice; 40 pounds of stockinette (for covering ankles of those athletes allergic to regular tape); 20 pounds of analgesic ointment (for sprains and assorted bumps and bruises); and miles of adhesive tape. This Larrie medical bill is just a supply to get a college sports year underway. More comes later in the season.

During the 1961 football season (varsity and freshman) Littlejohn used eight and one half miles of adhesive tape. Over a full college year he easily uses 18-20 miles of the white stuff. Over the course of his career at St. Lawrence Doc could lay a line of tape from the Larrie campus to New York City and almost a third of the way back again.

Doc is not only a trainer of repute, but he has served SLU in various capacities since 1942. A native of nearby Lake Placid, Littlejohn stated his career at Springfield College. Since those early days he has participated in, coached and officiated almost every sport on record. As Larrie mentor he has coached championship ski teams (his favorite), tennis, golf, track and baseball. He has even served as director of athletics and has instructed highly respected courses in the department of physical education since his arrival on the campus during World War II. His instruction in care and treatment of the physical body for the American Red Cross and the Boy Scouts of America extends over the last forty years.

Doc is well-schooled in the business of bumps and bangs. Some of his formal education includes the study of physical medicine at Bellevue Hospital and Cornell University. He is a graduate of numerous training schools in both this country and abroad.

He was recently honored at the University's annual block "L" dinner for his loyal and expert service to St. Lawrence athletes for the past 2 decades.

WITHHOLDING PARTICIPANTS FROM SPORTS AND RETURN TO COMPETITION*

By ROBERT J. MURPHY, M.D.
Columbus, Ohio

Note: Presented at the annual meeting of the State Medical Society, Milwaukee, May 9, 1962.

Doctor Murphy is Assistant Clinical Professor of Medicine and Team Physician at Ohio State University.

Reprinted from the *Wisconsin Medical Journal*, Vol. 61:417—421 (Sept.) 1962

The physician responsible for high school athletes is often called upon to make the decision of withholding a boy from competition. Coaches, and at times parents, exert considerable pressure on a physician in this regard. The purpose of this presentation is to summarize some of the factors important in making these decisions. The second portion of the presentation will outline some suggestions on when a boy may return to competition after injury.

Most deaths in high school athletics are accidental, and as such are unpredictable. The actual death rate is 2.08 per 100,000 participants.[1] In 1961 there were 15 fatal injuries in 720,000 participants in high school football. Accidents also occur in automobiles, in other school activies and in sand lot activities. Deaths among those athletes participating in organized high school athletic programs are probably no greater than if these same young men were allowed to be on their own in unsupervised activities.

Conditions Disqualifying A Boy From Competition

No attempt will be made here to cover all the disqualifying conditions, but those most frequently encountered will be briefly presented. Each case must be dealt with on its own merits, although there are certain guides to decisions in these areas. The sports which will be considered contact sports are football, basketball, wrestling, baseball and gymnastics. Noncontact sports include tennis, swimming, golf and track.

Maturity. A very important role that the family physician or high school team physician must play is that of determining maturity of the high school athlete. The state of maturity varies greatly in adolescents of the same age. By the junior year in high school almost all boys have reached the same stage of maturation, but some sophomores and many freshmen do not reach full maturation and should be withheld from competition with boys who have. Shaffer[2] has described a deep voice, acne, facial and body hair distribution, and the character of pubic and axillary hair along with genital development as the most reliable clinical signs of maturation. It is likewise important to spot the eighth grader who is mature earlier than his classmates, in order to prevent him from injuring his classmates in pre-high school activities. Many potentially fine athletes have dropped out of competition early because of some physical or emotional trauma experienced before they reached maturation and ability to compete with boys of adult physical characteristics.

Severe Disease or Absence of One of a Paired Organ. The severe disease or absence of an eye, ear, kidney, testicle or lung is an absolute contraindication for participation in contact sports. Although the incidence of injury to these organs is quite small, the potentially serious sequela of injury to the remaining organ certainly makes this decision an easy one.

Disease of the Cardiovascular System. There seems to be a tendency on the part of some physicians to be overly conservative in advising boys with heart murmurs. Many youngsters are denied permission for participation because of a functional heart murmur. The presence of a heart murmur is not in itself an indication to deny a youngster a chance to participate in sports. Pryor[3] and others have estimated that 50 to 60 percent of young people have functional heart murmurs at some time in their early lives. When a murmur is detected, a complete cardiac evaluation, including a history and physical examination, an electrocardiogram and cardiac fluoroscopy, is indicated. The presence of organic heart disease, especially rheumatic or congenital heart disease, is usually a reason for disqualification from sports. One death in high school football in 1961 occurred in a boy who died during football practice. It was discovered later that he had an atrial septal defect which had not been detected by previous examination.[1]

Exercise is not harmful to normal heart muscle. The so-called "athletic heart" is actually hypertrophy of the heart muscle in response to exercise. After retiring from active competition, the hearts of these athletes will usually become smaller in size.

The presence of an idiopathic auricular fibrillation not associated with organic heart disease is not disqualifying. Often premature ventricular beats will be encountered. If they disappear on exercise, they need not be disqualifying.

Direct contusion to the heart is an unusual but serious injury. One death in high school football during 1961 was attributed to direct contusion over the heart.[1] Any history of anterior chest wall contusion should be thoroughly investigated.

Hypertension in the teenager should be thoroughly evaluated to rule out coarctation of the aorta, renal disease, or other congenital abnormalities. If a blood pressure in excess of 140/90 is persistent, a thorough cardiac evaluation should be undertaken. In a highstrung emotional teenager it is not at all unusual to have an elevation of the systolic blood pressure at the time of the physician's examination.

Orthopedic Conditions. Any condition of the bone which weakens the integrity of bony function will limit, at least temporarily, participation in athletics. This includes slipped femoral epiphysis, various bone cysts, Osgood-Schlatter's disease and Legg-Perthe's disease. Infections and tumors of the bone also belong in this same category. Smith and Olix[4] have pointed out the infrequency of low back pain in the average high school athlete and suggest that any boy with persistent low back pain should be x-rayed and closely evaluated for some congenital abnormality or early rheumatoid spondylitis.

Disease of the Nervous System. Congenital or acquired diseases of the nervous system which affect the musculature will limit competition. The best prevention for injury is an adequate muscular system which can ward off trauma. Many serious injuries occur when a player is hit from the blind side, such as a block applied during a punt or kick-off return, when he is not able to mobilize his muscular system to accept the blow. Certainly any major abnormality of the muscular system would be disqualifying from competition.

The decision of whether a boy with headaches and a previous history of head injury should participate is a

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difficult one. The regimen of the staff at Ohio State University for many years has been to obtain an electroencephalogram of all boys with previous severe head injuries or persistent headaches. Any boy who has sustained more than two periods of concussion in a single season is ruled out of further competition for that season and very close examination is carried out before the next season. Approximately 50 per cent of deaths in athletes are due to brain injury, and careful attention to concussion is essential.

Returning Participants To Competition

One of the most difficult decisions any physician has to make concerns when a boy should be permitted to return to competition. Obviously each case must be individualized but here are some general suggestions which may be of some value to the high school team physician.

A boy should never be permitted to play with any injury where aggravation can lead to prolonged or serious disability. On the other hand, the high school coach has the right to expect his team physician to permit his players to play with an injury when it will do no harm. If you can answer the question "Will it injure the boy to play?" in the negative, then it is a coaching decision as to whether he plays. In my opinion the team physician should not withhold a player with a painful but not serious injury because he thinks a second stringer can do better. This is a coaching decision and should be left to the coaching staff.

The use of narcotics orally, or local anesthetics directly into an injured area, is to be condemned if their use is to permit the boy to play. Nothing should be used to remove pain, the normal body defense, in any athlete.

Athletics is a particularly fertile field for the medicine man, soothsayer or drug peddler who is pushing his latest medicine or injection which will prevent bruising, hasten healing, or return the athlete to activity days quicker than normal. Patton and Patterson[6] have pointed out that healing after trauma follows a definite course. They state that "even these healthy young people involved in high school injuries require a basic minimum of time for proper healing of sprain or torn ligaments or muscle. Since we know that a fascial tear or ligament begins the fibrous phase of wound healing in three or four days and strength does not approach normal until three weeks, care and judgment must be exercised in allowing the return to competition." There is no drug to stimulate wound healing. Certain modalities are available to decrease hemorrhage and edema, and to aid normal rapid wound healing. There is nothing that can be applied, consumed or squirted on that will speed the healing process.

We must avoid over zealous treatment and be patient. There is no substitute for time and rest as a therapeutic modality.

Specific Guides For Return To Function

It is the routine of our staff to treat most soft tissue injuries such as sprains of ligaments, strains of tendons or muscles, contusions of muscles or separation of cartilagenous-bone continuity in basically the same manner. This consists of the application of an ice bag for 30 to 60 minutes following an injury with elevation of the affected part. Following this, the examination of the part is more satisfactory. The area involved is often injected with 150 to 750 units of hyaluronidase and pressure applied directly over the injury. It is then wrapped with an elastic bandage and the patient told to give it complete rest for 24 to 48 hours. The patient is started on a program of heat, active exercise through painfree range of motion, followed by active resistive exercises as the patient is able to tolerate them. If joints are filled with bloody fluid, these are generally aspirated every one to three days. Passive motion is rarely used in our therapy program. With this general regimen in mind, some of the most common injuries encountered are listed and specific suggestions on recovery of function are noted.

Knee Sprains. Injuries to the cartilage or cruciate ligaments are strictly orthopedic in treatment and should be referred to an orthopedic surgeon for surgery and/or casting. Most knee injuries involve the medial or lateral collateral ligaments and are manifested by tenderness over the ligaments and pain when the foot is forced inward and outward with the knee in full extension. The boy is allowed to return to activity when he has full range of motion of the knee without severe pain and can lift weight with the affected knee to 75 per cent or more of the normal knee. Prior to this time, he can begin running if the knee is properly supported to prevent reinjury. The average period of disability is 10 to 21 days.

Ankle Sprain. Swelling often persists for weeks in an ankle and again the criterion to return to activity is full range of motion of the ankle with ability to lift weights equivalent to 75 per cent of the other ankle. Both ankle and knee injuries should be taped for the remainder of the season. The ankles also require 10 to 21 days for recovery.

Acromioclavicular Sprain. A sprain of this joint is popularly called a shoulder separation but rarely do we see a true separation of this joint. There is usually a partial tear. This is an injury peculiar to football and is sustained either by the player falling on his shoulder in the area of the deltoid or receiving a blow in which the shoulder is depressed and the head forced in the opposite direction. When a boy can move the shoulder in a complete range of motion without pain and can lift weights with the affected arm to 75 per cent of the other side, he can usually return to activity. It is very difficult to protect this joint by any support, such as adhesive tape, but fortunately this injury does not recur too often.

Muscle Contusion. This is a very common football injury and results from a direct blow to a muscle with a shoulder pad or helmet. Poor fitting equipment often will result in slipping of pads, allowing this type of injury to occur. A prolonged course often follows and patience is necessary in treating this particular injury. There is usually hemorrhage into the muscle sheath; and if proper early care is not taken, myositis ossificans may develop. Return to activity is permitted when full joint range of the affected muscle is possible and the patient is able to utilize the muscle, that is to run or throw without pain.

Muscle or Tendon Strain (pulled muscle). This often occurs while running and consists of pulling of the muscle or tendon fibers within the muscle sheath. The areas most commonly involved are the hamstring muscles, groin muscles and adductors of the thigh. The peroneal and posterior tibial tendons of the foot are at times also involved. Return is not permitted until full range of motion is possible and active function is pain free, but a graduated progressive resistence program is undertaken at the earliest possible moment.

Iliac Crest Bruise. Most players wear hip pads which come above the iliac crest, but with carelessly applied

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pads, a particularly heavy blow results in tearing of the attachment of the abdominal muscles at their attachment on the crest of the ilium. Fortunately, after return of range of motion, this injury can be protected with a pad. Although quite painful at first, it usually responds quickly, and disability is less than a week.

Brachial Plexus Stretch Injury. A stretch of the brachial plexus in the neck is usually caused by a forceful blow on the neck pushing the head to one side. The patient has pain over the plexus in the neck with weakness of the shoulder girdle and sometimes the arm. This injury has been much more prevalent since the use of the "head in" blocking techniques. Healing is slow and reinjuries are frequent. There is no good preventative taping. Two years ago we instituted a program in the off season at Ohio State University consisting of weight lifting with head and shoulders. This combined with isometric contractions of neck muscles, has measurably increased the strength of the neck muscles and cut the incidence of this injury to about one-third. We also feel that increasing the strength of the neck muscles has also decreased the head injuries.

Head Injury. It is always a difficult problem for the attending physician to determine when a boy who has a head injury in a game should be permitted to return to activity. It is important to bear in mind the safety of the player. In general, a boy who is momentarily dazed but who has prompt and complete return of sensorium is permitted to re-enter contact. A second head blow eliminates him for at least seven days. If a boy is actually unconscious for 30 seconds or longer, he should be withdrawn from the competition for seven days and allowed to return to activity only when completely clear and free from all signs and symptoms. If a boy has the second concussion within a season, he should be barred from further competition.

Many boys will suffer a concussion but will not be unconscious. This is manifested by confusion and loss of memory. This boy should be removed immediately from competition and not returned to action until completely clear.

Summary

There are few conditions which disqualify a boy from participation in athletics. This presentation summarizes some of those most frequently encountered as well as many which are not disqualifying. The return of an injured player to competition requires a basic understanding of the healing process. Specific injuries to the knee, ankle, acromioclavicular joint and muscle contusion, strain, iliac crest bruises, brachial plexus injuries and head injuries are presented.

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