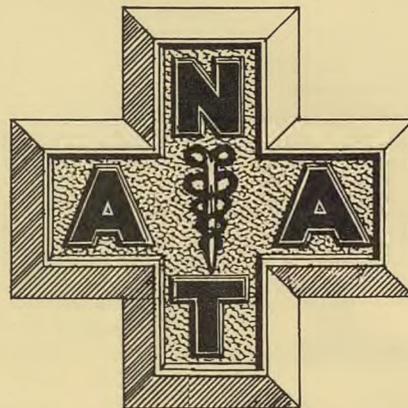


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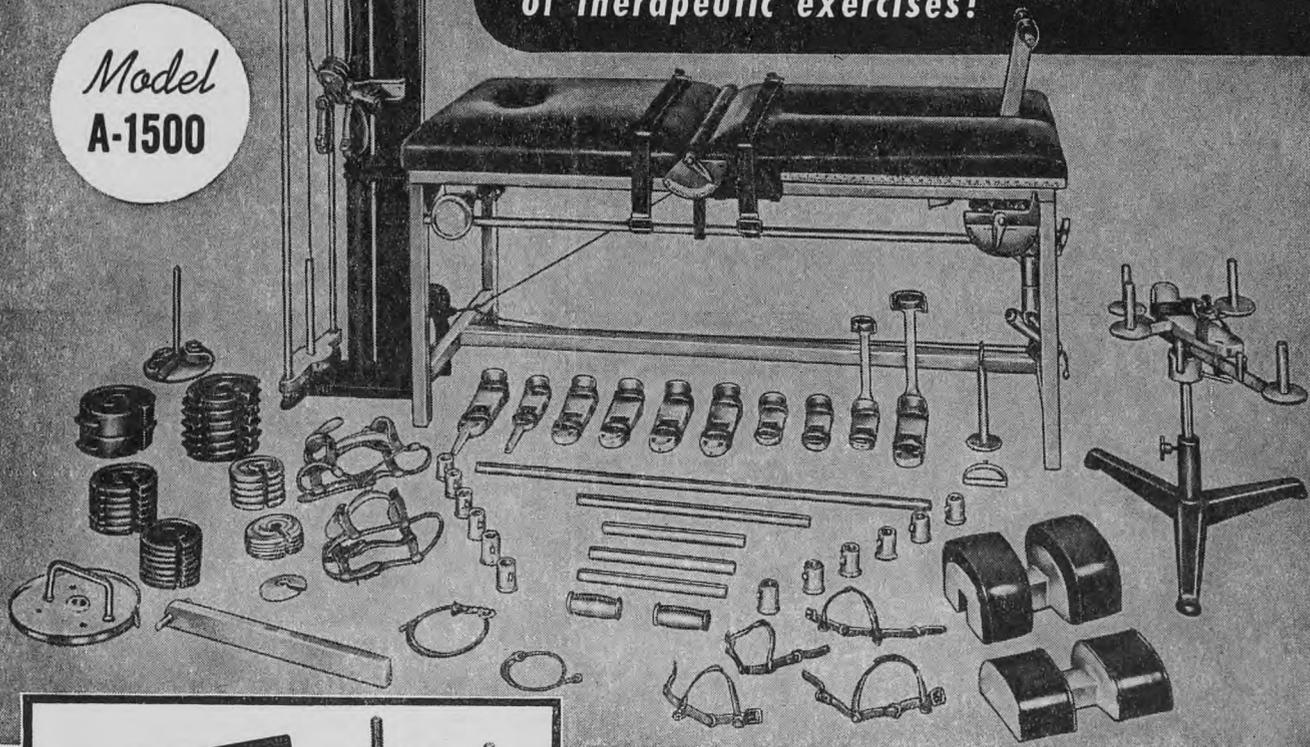
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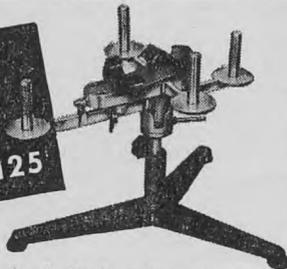
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AMERICAN COLLEGE OF SPORTS MEDICINE— ITS CONTRIBUTION TO THE ATHLETIC WORLD

GROVER W. MUELLER

F.A.C.S.M., Director, Division of Physical and
Health Education

Philadelphia Public Schools, and Secretary of the College

"Mr. President, Mr. Secretary, Mr. Program Chairman, I am glad to see a few faces in the audience which are familiar to me, along with Frank's face. The first time I saw his, it looked much younger than now, but he's still a handsome guy. Recognizing some of you makes me feel at home, at once.

I want to start out by congratulating this group on having your organization and having continued it for so many years and on coming to conferences of this kind. It's trite to say that, but nevertheless important, that no group and no individual can do a real professional job unless it meets with its fellows, exchanges opinions, learns the latest and best procedures. That's true of any profession, whether you are referring to the medicos, the physical educators, the psychologists, the educators, or what; and all of them felt the need many, many years ago. In the field of sports, a considerable number of years ago, the medical men, primarily in other countries strange to say, recognized the great need for getting more information with regard to sports, and they organized a sports federation. With the passing of the years, they established in some of the countries, definite curriculums in medical schools and granted diplomas in sports medicine. I have said that several **other** countries have had organizations for a number of years. We did not in **our** country and indeed we do not yet have an organization consisting purely of physicians in this field.

Many of us felt the need for a similar organization several years ago, but we felt that a much broader base to be important. The other countries, I've said, have only medical men in their associations. They were amazed when we pointed to the importance of a broader base, and I think they are still amazed. We felt it extremely important to bring into one group for mutual consultation, for purposes of a mutual journal, and for mutual research—medical men, physical educators, coaches, trainers, nutritionists, psychologists, and other related groups. You see, each particular interest group here and abroad has been working along its own single lines, and no group can do that and arrive at the right answers. The doctor knows "medicine." If he has been an athlete, or if he is or if he has been associated with high school or a college, with school, college, or professional teams, then by association with the coaches and trainers, he will have learned some things; but his knowledge will still be too narrow and limited. So, our college, the American College of Sports Medicine, was established in 1954. It is incorporated on a national basis, and we have representatives of all these disciplines which I have named, plus some others.

I have told Frank Wiechec and others that I wasn't going to make an effort to sell to you gentlemen the idea of becoming members of the college, as important as I deem that to be. I've told them that I am just going to tell you about the college, and then if you are interested (and I hope you are) you can follow the necessary procedures in filing applications.

I have brought with me for distribution a quantity of college brochures. Let me read quickly the purposes of the college and to give you an over-all idea. First, to promote and advance scientific studies dealing with the

effect of sports and other forms of motor activities on the health of human beings at various stages of life. Second, co-operate with other organizations concerned with various aspects of human fitness. Third, to sponsor meetings of physicians, physical educators, and other scientists whose work is relevant to sports medicine. Fourth, to make available postgraduate education in fields related to the objectives of the college. Fifth, to initiate, encourage, and correlate research. And, sixth, to publish a journal dealing with scientific aspects of activity and their relationship to human fitness.

Beginning with its first year, our college has had an annual conference on the national level, plus regional meetings in various parts of the country. Our next meeting will be in Miami Beach, April 23-24, 1960, with the usual outstanding program and we would be pleased to have you attend as guests. So, we have these annual meetings, the national and the regional meetings.

We make contributions to approved applicants to assist them in carrying on research.

We annually have a schedule of workshops: The matter of workshops may strike you at first as being inconsequential, but they are in fact very valuable. They make it possible for any member of the college to visit any other member who is doing either research work, or conducting a conditioning program, or whatever it may be. The person whom he visits agrees to serve as preceptor and to devote some of his time during the visit to conference and demonstration with the visiting members.

Further, any member may call on any other member, no matter how high the latter's station in medicine or in any other profession, maybe for advice, opinion, and assistance in formulating and promulgating a project. I am saying this all rather hurriedly but I think you're catching the point.

Let me read one or two more paragraphs from this brochure. Under the heading "Co-operative Research Vital": Leaders in medicine, physiology and physical education have made commendable progress in studying the effects of various forms of physical exertion on the body. However, there has been no adequate interchange of experience and knowledge. This professional isolationism has often resulted in a failure to consider important aspects of the problem and to translate into practical application significant findings by independent investigators in the various related disciplines. The American College of Sports Medicine was established with the avowed aim of closing these gaps and fusing the experience and know-how of top flight scientists in all related fields under a united aegis. Among other accomplishments, co-operative action should produce an authoritative pharmacopocia of motor activities—a reliable reference manual to aid in prescribing the type and amount of activity for individuals according to their respective needs and capacities." That is all I am going to read in this, you'll get copies of it.

I think that by this time, you can see the importance of our college getting the know-how, the opinions, and the research of trainers and conditioners; and I think you will recognize that you fellows could probably gain a lot from the college.

AMERICAN COLLEGE (Continued)

I want now to read to you a number of titles of papers which have been presented at the last two or three of our Annual Meetings, so that you may get an idea of the general type and the specific types of subjects which are considered. (By the way we presently have at least two of **your** members as members of **our** college; maybe Frank knows of others. We have Oliver Dayton and Frank Weichec as members; and perhaps some of the rest of you are.) Let me read just a few of the topics. I tried to get a 1957 program, Frank, your name and topic is on that, but I couldn't obtain one in time. "History and development of Therapeutic Exercise and Rehabilitation and Its Relation to Sports Medicine." "The Conservative Management of Knee Injuries of The High School and College Athlete." "Effective High Fat or High Carbohydrate Diet on Inclination to Exercise." "Physical Fitness Changes Associated with the U. S. N. Underwater Swimming Program at Key West." "Re-action Time, Movement Time, and Age." "Fitness and Fatigue." "Research on Exercise Lessons by Comparative Physiologists." "Prevention of Injuries in Boxing." I don't want to take the time necessary to do so, or I'd tell you the names of the speakers. All of these papers were presented by outstanding authorities. For example, the last one "Prevention of Injuries in Boxing" was by the chief medical advisor to the N. Y.

State Boxing Commission; and "Medical Problems of Basketball Players" was by Dr. Simon Ball, the medical advisor of the Warriors basketball team. I'll read a few more of the titles. "The Prevention of Injuries in Track and Field Athletics." "The Prevention of Injuries in the High School Football Program." "Exercise on the Kidney." (The kidney is frequently overlooked and is of extreme importance.) "The Effective Use of Strapping in Athletics"—your colleague Oliver Dayton presented that paper. "Protective Measures for Automobile Racers." "Recent Research Findings in the Problem of Knee Injuries in Athletics." "Implications of Preventative Conditioning." "Prevention and Treatment of Elbow and Shoulder Injuries in Baseball Players." "The Role of Physical Conditioning in the Prevention of Injury," and many, many more. I repeat, I wanted to read these from former programs to indicate to you how closely many of them are related to your specialty.

May I urge that at least some of you attend our meeting this year in Miami Beach; come down and visit us whether you are members or not. Some of the papers to be presented are: "Relaxation Applied to Medicine and Athletics," "Postponement of the Degenerative Changes in Old Age Through Exercise," "Electro-cardiographic Studies of Old Tennis Players," "How Much Exercise Do

Continued on page 3

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Purdue University, Lafayette, Indiana

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AMERICAN COLLEGE (Continued)

You Need?", "Classification of Wrestlers," "Recent Studies in Physical Fitness Evaluation," and "Summary of Research on the Relationship of Exercise to Heart Function and Heart Disease." There are many more. I don't want to bore you with a reading of the entire list but I do want you to get a good idea of what's going on.

I should like to announce that just prior to and during the Olympic Games in Rome this summer our college is sponsoring somewhere between seven and nine days of scientific sessions on sports at which papers will be presented by leaders throughout the world, including a number from this country.

Sort of in conclusion, I want to state that the American College of Sports Medicine has taken a very strong hold in this country and its influence is growing rapidly. We have had no active campaign for membership which is the probable reason why some of you, perhaps many of you, have not heard of it. In spite of the absence of drives, the members continue to come in considerable numbers. At this very moment we are processing 17 applications. In fact they are coming in so fast now that I am reminded of a story concerning rapidly increasing numbers. The wife of a young couple who had no children was in the maternity ward of a hospital and as most of you fellows do in such situations, the husband was pacing the floor waiting to learn what had happened. Suddenly the door burst open, the nurse came in and said "sir—you've got a boy." He said "A boy—that's fine." He hardly had the words out of his mouth when a second nurse came in and said "You've got another boy." He said "Two?—gee that's great." The door opened again and a third nurse said, "You've got a daughter." The husband started for the door saying "I'm going in and have a talk with my wife!" The nurse stopped him and stated emphatically, "No, no, no, you can't go in there—you aren't sterile." He said, "You're telling me?"

We're getting our members just as fast as that young couple; the big difference however, is that that poor guy had no choice. Our college has a Credentials Committee, a Membership Committee, and a Board of Trustees, all of which must approve all applications.

Here are the college brochures for distribution. I wish you would take them and read them. If you are interested please ask for an application form. We would be delighted to have every trainer in the United States apply.

May I say this in conclusion—we need you and I think you need us.

Question: May I ask "Do we get the publications if we join?"

Mr. Mueller: All members will get them.

Question: Is it a monthly?

Mr. Mueller: Not yet, no—it is an annual.

Mr. Mueller, we would like to thank you very much for your presentation on the college. I know that there has been a great deal of interest. We would like to have you answer some questions if you will. Just before I open for questions I would like to make one reference to the college, that is to the contribution it is making by providing workshops for members of the college. Now these workshops, I think, are an outstanding contribution. They are in effect an understanding between members that anyone in the organization may come to observe, to see, to ask questions, at any of the institutions or areas where they are working; to seek out those projects with which they are experimenting, and to stay as long as they want, and the college is asking members to conduct these

workshops and make them available for anyone who is interested. Is that right Mr. Mueller?

Mr. Mueller: Yes, that's right.

Question: How may a person get in touch with people or with projects that they are interested in? Could you tell us?

Mr. Mueller: Each member receives a schedule of workshops. Prior to that all members are asked if they will volunteer to serve as preceptors. The returns come in, we put them together and send copies to all members, and from that point on the member clears through the secretary for dispensation.

Mr. Wiechec: Thank you, I think that is clear. Now if there are any other questions I am sure Mr. Mueller would be glad to answer them.

Question: How can we obtain application forms and other information?

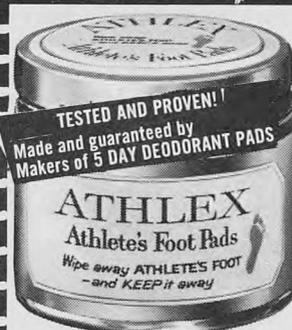
Mr. Mueller: Inquiries are to be sent to me as secretary. Just address me at the Board of Education, Parkway at 21 St., Philadelphia 3, Pa.

Bill Linsky: I will print that in the news letter Mr. Mueller.

All Trainers, Coaches, and Physical Educators interested in the care of athletic injuries of the foot and ankle are invited to attend a panel on the subject presented at the National Convention of the American Podiatry Association, August 30, 1960, at the Drake Hotel, Chicago. Hours are from 10:30 to noon. Admittance by showing a membership card in your respective associations or a letter from your local Podiatrist (Chiropodist).

DR. JOE DOLLER
Panel Moderator

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TREATMENT OF FOOTBALL INJURIES

DONALD B. SLOCUM, M.D.

Eugene, Oregon

Football has long been a valued segment of the sports heritage which has become an integral part of the American way of life. Educators and physicians alike, although divided on some issues, agree that a properly planned and controlled sports program has definite educational, physical and social values. Such a program not only builds strong, healthy, coordinated bodies, but also stimulates the desire for competition so essential for progress, aids in socialization through the necessity for teamwork and cooperation, brings out qualities of self-motivation, pride of achievement, emotional stability, and reduces juvenile delinquency. Be that as it may, the concern of many of us is that permanent injury may follow the rigors of this vigorous body contact sport. As physicians our major objectives lie in the prevention of injury, treatment of such when it does occur, and early rehabilitation of the injured athlete. In the last instance the attitude of the physician is important for without confidence in him the injured player will not cooperate and submit to the technical aspects of adequate treatment, or he may hide an injury for fear of being eliminated from his chosen sport. The goal must be full recovery so that the player may return to participation with **safety**; if this cannot be accomplished a little time may be well spent explaining the medical reasons for restriction from the game. Without comprehension of these reasons the teenage and pre-teenage athlete can scarcely understand why early, adequate and thorough treatment offers the quickest route to recovery and return to competition.

The first step in athletic safety is to ensure physical fitness through the pre-participation physical examination. This serves to determine those physically qualified for play, eliminates the unfit, and segregates those who need medical treatment either to raise the physical level to a point which will permit participation or to improve performance. The prospective athlete is first graded into categories of body build, strength and physical maturity. This is particularly important in the pre- and early teenage groups where matching of opponents is essential if injury to growing tissues is to be avoided. For instance, the twelve-year-old child may vary in physical maturity between the physiological ages of nine and fifteen. This does not necessarily apply to body size alone but is primarily concerned with musculoskeletal development and coordination. Fortunately there is a fairly good correlation between somatotype, muscular strength, physical maturity and athletic performance which naturally segregates the more advanced physical types into the better teams. The big, fat, slow boy (the endomorph) and the thin, gangly, elongated one (the ectomorph) will almost routinely be more immature, weaker, and less coordinated than the muscular well-developed "athletic type" (mesomorph and meso-endomorph). Muscular strength can usually be evaluated by gross testing, although specific strength tests give more reliable information. Physical maturity can usually be judged by general body development, the appearance of pubic hair, etc., but in cases of doubt x-ray of the wrist for skeletal boneage (which parallels physical maturity) will be of value. The obvious import of such tests is to avoid mismatching of opponents. When this is done, examination by systems of the various parts of the body is carried out. The physicians should always bear in mind that it is just as important to the individual to determine those physical defects with which

the athlete may safely compete as those which would eliminate him. The psychic trauma which may occur when the stamp of "cripple" is placed on a boy may have a major impact on his future, whether it be on the basis of musculoskeletal, cardiac, or other defects. For example, a functional heart murmur or orthopaedic defect may have little other than a diagnostic significance and to eliminate a boy on this basis would be unjust. Amongst the non-disabling conditions which are correctable, posture and flexibility should receive particular note, since they play a significant role in body movement and susceptibility to injury.

Although the physician has little actual control of other factors pre-disposing to injury, such as training, conditioning, knowledge of game skills, and protective equipment, it is important that he have the basic information as to when, where, how and to whom football injuries occur. This is well brought out by a recent study by Krause who compared injuries sustained in Oregon High Schools in 1955 with similar studies by Van Brocklin in 1948 and Lillie in 1939. Although the basis of injury varied somewhat in the three studies, because of better protective equipment and changing game techniques (trap blocking, etc.) the incidence and type of trauma has remained relatively constant over a period of years. He found that the halfback position was most hazardous and accounted for 26.27% of injuries and that the quarterback and center positions were safest. Blocking was the single greatest cause of injury. More injuries were likely to occur in smaller schools, in larger squads, in games (as contrasted to practice) in the last half hour of two hour practice sessions, and in the first (12.5%) and third (15.6%) quarters of games. Knee (11.3%) and ankle (7.3%) sprains have retained the lead in incidence throughout the years.

Since ligamentous traumata of the knee and ankle present the largest single group of serious injuries in football, the present discussion will be limited to this phase. Unlike fractures where therapy is well standardized and generally efficient, or contusions in which recovery with minimal disability is the rule, ligamentous trauma is all too often regarded as minor in nature and worthy only of palliative or expectant care. The old adage that a "sprain is worse than a fracture" should be altered to read "a sprain treated ineffectually or not at all is often worse than a well treated fracture." The genesis of the "laissez faire" attitude at first lay in a failure to understand the nature of ligamentous injury, its pathology, and the basic requirements for healing and repair. The system of nomenclature did not effectively describe the functional state of the involved joint at and following injury. With the development of definitive surgery, it became apparent that the extent of ligamentous injury may vary from a simple sprain without loss of strength or instability of the joint, to complete dislocation. To categorize these clinical types, a classification embracing a visual concept of the pathological anatomy better serves the clinician in orienting his concepts of treatment than one which deals with the degree of damage to the ligament alone. The requirements of such a classification are that it must be simple enough to be understood by physician, coach, trainer, and participant, that it must use accepted medical terminology and that it must eliminate the connotation that ligamentous injuries are "just sprains" for this implies lack of seriousness, early return to participation, and palliative treatment only. By definition, a sprain is a partial or complete ligamentous tear resulting from a subluxation of the joint as it is forced beyond its normal range

Continued on page 6

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TREATMENT

(Continued)

Term	Synonym	Definition
Simple Sprain	Sprain	A stretch injury of a ligament without loss of strength or joint stability.
Incomplete Ligament Tear	Moderate Sprain	A stretch injury with a partial ligamentous tear permitting loss of strength and joint stability in one segment of the range of joint motion only.
Subluxation	Severe Sprain	A stretch injury with a complete ligamentous tear permitting instability throughout the range of joint motion protected from abnormal motion by the torn ligament.
Dislocation	Dislocation	A stretch injury with a wide ligamentous tear permitting complete displacement of the joint.

of motion. One extreme of this situation is dislocation where ligamentous tear is so extensive that the contiguous joint surfaces are completely displaced; the other, a simple sprain without loss of ligamentous strength or continuity. It has not been general practice to designate dislocations as primarily ligamentous injuries (together with associated tears of the joint capsule and synovia) but rather to categorize the displacement as the essential factor and to consider the residual abnormal mobility of the joint as an unavoidable sequela. The essential difference between dislocation and subluxation is simply one of degree: It is the extent of trauma to ligamentous and associated structures which determines whether the ligament remains intact, is partially torn, completely torn, or widely torn to the extent that joint dislocation occurs: and in direct corollary to the extent of ligamentous damage is the degree of joint stability which may be complete, may be unstable in one segment of the range of motion only (partial ligamentous tears), unstable throughout the range of motion (complete tears), or may be completely unstable so that the joint will actually luxate.

Since the clinical course is dependent upon the degree of joint displacement at the time of injury, the writer prefers the above classification which implies both the mechanism and the residual instability of the joint.

The function of ligaments and related structures and their response to trauma should be understood before discussing treatment. A **ligament** is primarily constructed to provide stability and restrict motion of those planes of movement for which the joint has been designed. It is composed of dense, relatively acellular, collagenous fibers arranged in parallel longitudinal bundles according to lines of tension. While it is flexible, it has very little elasticity so that when it is stretched unduly it will either tear in its continuity, be avulsed from its moorings to bone, or the ligamentous attachments may not yield but the bone itself may give way so that a sprain-fracture results. When a ligament is torn obliquely the sides of the ligament draw toward their attachments but remain in contact due to the nature of the tear and heal with elongation; such a ligament has lost its normal restrictive function. When the tear is transverse, the frayed ends of the ligament lose contact and a gap remains which must be bridged with scar tissue. This probably occurs when the ligament is torn within the elastic areolar covering which grips the lax ends and prevents them from falling back in place when the joint resumes normal position. If the ligament is allowed to heal with scar tissue bridging the gap, not only will it be elongated and weakened because scar tissue has little tensile strength, but its mobility is also likely to be impaired by cicatrix. **It is self evident that there is definite fallacy in the assumption that bony alignment is an indication of normal ligamentous apposition.** Immediate surgical replacement of the ligament without tension is easy because of the inelastic nature of the tissue, but in seven to ten days the retracted ligament shrinks

and the tissue becomes edematous and friable. This limits the opportunity for optimal surgical repair to the early post-injury period.

The joint capsule serves a somewhat different function. Rather than limiting abnormal motion it exerts a check-rein action to movement beyond the extremes of normal motion. Tears occur in the capsule when the restraining action of ligaments is no longer present and the full brunt of the traumatizing force is brought to bear upon it; capsular tears vary in extent relative to the amount of ligamentous injury. Synovial rupture occurs following more severe capsular tears.

In football, the knee and ankle receive the greater share of ligamentous injuries. Treatment is based on the pathologic sequence of events following injury:

- (1) Rupture of the ligament.
- (2) Bleeding from torn blood vessels (intra- or extra-articular).
- (3) Hematoma formation.
- (4) Absorption of hematoma, and
- (5) Healing by scar tissue varying in amount with the hematoma. The goal of treatment is to obtain complete rehabilitation of the athlete.

In dealing with the ligament the treatment has three purposes:

- (1) To restore the ligament to normal strength.
- (2) To prevent healing in an elongated position.
- (3) And to preserve ligamentous mobility to insure free joint movement.

In a **simple sprain** where the length and strength of the ligament is unimpaired, the problem is simply one of eliminating hemorrhage and edema, providing transitory rest to the joint to permit healing, protecting it against re-injury by protective strapping, mobilizing the joint, and strengthening the supporting muscles. The patient with the simple sprain is incapacitated for only a few days before return to competition, and the principal problem is to prevent further injury which may result from lack of normal use of the joint.

In a complete **subluxation** of the knee or ankle, the restoration of bony alignment and cast immobilization will not re-establish the length and strength of the ligament. Here the indication is clear-cut: re-establish the ligament through surgery or be faced with a permanently relaxed and weakened ligament and an unstable joint. Since surgical repair may be done easily in the first ten days following injury with excellent results in the hands of skilled surgeons, and since the results of later surgery or reconstruction are progressively poorer with each successive lapse of time, it is essential that the diagnosis and decision for surgery be made early. The "wait and see" attitude has no place in treatment for it can only mean acceptance of avoidable disability. An athlete with an unstable knee or ankle is rarely able to return to running or contact sports.

Continued on page 7

A GUIDE TO DIAGNOSIS OF LIGAMENTOUS INJURIES OF THE KNEE AND ANKLE

Signs and Symptoms	Mild Sprain	Incomplete Ligament Tears	Subluxation	Dislocation
Pathology	Tear of a few ligamentous fibers only; no loss of strength	Partial tear of ligament (varies in extent from minor to major); definite loss of strength	Complete tear of ligament with subluxation; often sprain fractures at ligamentous attachments	Complete tear with joint displacement; often accompanied by fracture
Disability	+	++ to +++	++++	++++
Tenderness				
1. Degree	+	++ to +++	++++	++++
2. Location	Site of tear	Same	Same	Same
Pain on normal motion (early)	(--)	(-)	+	+
Pain on stretch of involved ligamentous	Mild	Moderate	Severe	Cannot be carried out due to pain
Ligamentous relaxation (abnormal motion)	None; Ligament intact	In one portion of range of motion only (i.e., in knee at 180° none; at 135° varies with extent of tear)	Complete	Complete
X-ray	Normal	Normal or sprain fracture; may show subluxation on stress x-ray	Normal or sprain fracture; subluxation on stress x-ray (use anesthesia if necessary in knee or ankle)	Dislocation with or without fracture

TREATMENT

(Continued)

Dislocation or fracture dislocation is merely a more extensive form of subluxation and, like it, demands early reconstruction for the predicament of the ligaments is no different than that in subluxation but is simply complicated by fracture and extensive capsular damage.

It is the **incomplete ligament tear** with partial subluxation that offers the clinician the greatest challenge, for here one portion of the ligament remains in continuity while the other is subjected to a tear of varying degree. One must not fall into the diagnostic trap of examining the joint in one position only, for if the section of the ligament protecting this position is in continuity there will appear to be no damage. For instance, if the tibial collateral (medial) ligament of the knee is examined in extension and the posterior portion of the ligament is intact, no relaxation will be demonstrated on forced valgus; on the other hand, if the anterior portion of the ligament has been torn this same knee, when placed in 35° to 40° of flexion will demonstrate abnormal medial motion. Since the knee is most commonly injured in flexion, this latter test assumes great importance. The choice of treatment actually depends on the extent of the ligamentous damage. If slight, as demonstrated by minimal abnormal mobility, cast immobilization from four to six weeks will be adequate; if severe, ligamentous repair should be carried out. I know of no way other than experience to select the type of treatment for moderately severe partial tears. Clinical judgment remains the guide in selecting the method of obtaining ligamentous apposition and if there is a doubt one should err on the side of perfection rather than expediency.

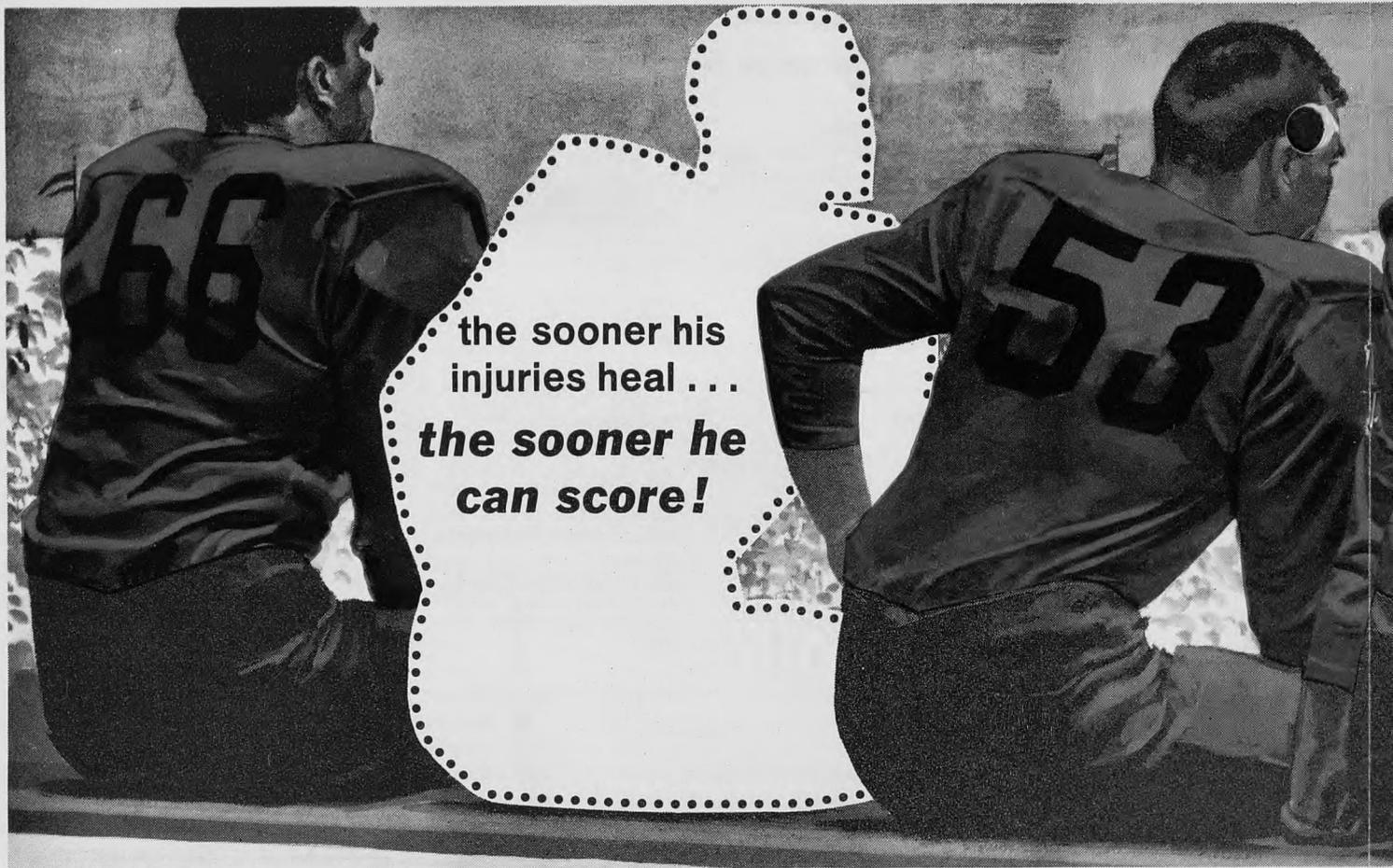
Post-traumatic swelling may arise either from hemorrhage or edema. Bleeding from torn vessels is usually responsible for rapid early swelling, while reactionary edema usually follows several hours to several days later. Regardless of its origin, swelling must be controlled for if it is not, excessive scar tissue will follow in its wake and may restrict joint motion; in the first instance through the organization of the hematoma and, in the latter, by the diffuse interstitial fibrosis which follows chronic waterlogging of tissues.

In the immediate post-injury period swelling is controlled by a temporary bandage and the use of ice water. Cold will cause temporary vasoconstriction and minimize bleeding into the tissues. The time limits of its effectiveness for this purpose is about twenty to thirty minutes; following this, a reactionary vasodilatation occurs as the body attempts to counteract the reduced skin temperature. The subsequent value of cold is therefore based on its well known sedative effect which often provides considerable comfort to the patient. The next step is the application of the pressure dressing. Cotton or sheet wadding may be used about the joint, extending well above and below. Sponge rubber is used for additional compression and is placed over the sites of hematomata and the natural hollows about the joint which might be spanned rather than compressed when the covering elastic bandage is applied. Such hollows are found at the sides of the patella in the knee and about the malleoli in the ankle.

Once a hematoma has formed every effort should be made to hasten its absorption. If healing occurs through organization of a large clot, residual scarring is excessive and may encumber joint and soft tissue mobility. While diffusion of the hematoma by a sponge rubber pressure dressing is the most effective method, massage has a valued place in the armamentarium of treatment in instances where immobilization is not required. It should only be undertaken after bleeding is controlled and then should start at the proximal edge of the area and work the tissue fluids toward the trunk. The efficiency of this method is greatest when carried out several times daily rather than two or three times a week, which is little more than palliative treatment. The use of trypsin, chymotrypsin, and streptokinase and streptodornase may also hasten the absorption of the hematomata and edema. The efficiency of these drugs is variable: in the author's experience it has proven dramatically effective in some instances, has appeared to hasten decrease in swelling in many cases, but in about a quarter of the cases has had little or no effect.

Aspiration of joints is carried out for diagnosis, to aid in the application of pressure dressings, and to increase healing and prevent intra-articular damage. In the initial

Continued on page 10



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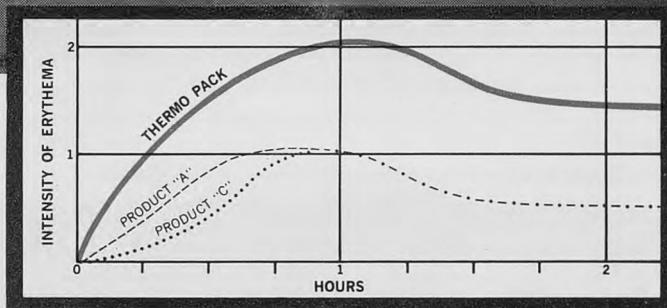
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A GUIDE TO THE TREATMENT OF LIGAMENTOUS INJURIES OF THE KNEE AND ANKLE

	Mild Sprain	Incomplete Ligament Tears	Subluxation	Dislocation
Control of Bleeding	1. Ice early 2. Pressure dressing with sponge rubber 3. Immobilization	1. Ice early 2. Same 3. Same	1. Ice early 2. Same 3. Same	1. Ice early 2. Same 3. Same 4. Anatomic reduction of dislocation and fractures
Release of Vascular Spasm	1. Procaine injection 2. Ethyl Chloride spray (avoid frost-bite)	1. Procaine injection in lesser tears	1. None	1. None
Absorption of Hematoma	1. Hyaluronidase injection 2. Fibrolytic enzymes: Trypsin, Chymotrypsin, Streptokinase, Streptodornase 3. Massage 4. Pressure dressing	1. Same 2. Same 3. Massage in lesser tears 4. Same	1. Same 2. Same 3. — 4. Same	1. As indicated 2. Same 3. — 4. Same
Control of Edema	1. Pressure dressing 2. Elevation not required	1. Same 2. Elevation	1. Same 2. Elevation	1. Where applicable 2. Elevation where applicable
Aspiration of Joints	1. Usually not necessary	1. As necessary	1. As necessary	1. As necessary
Surgical Repair Ligaments	No	In more severe partial tears	Yes	Yes
Immobilization	1. Strapping to prevent reinjury; early ambulation (ankle) or mobilization	1. Plaster splint with compression 2. Walking cast after swelling subsided until healing	1. Same 2. Same	1. Same 2. Same
Convalescent Treatment	1. Heat 2. Massage 3. Mobilization 4. Progressive resistive exercises 5. Adhesive strapping	Same	Same	Same

TREATMENT (Continued)

stages aspiration is often necessary to relieve the pressure within a joint so that pain may be relieved and examination may be carried out throughout a wider range of motion than otherwise possible. The presence of blood within a joint is indicative of synovial or capsular damage. This is of prognostic value as well as being a therapeutic guide. Intra-articular swelling is a barrier to the application of pressure dressings since a swollen joint will not permit the pain caused by the increased tension resulting from their application.

A word might be said of the use of procaine derivatives. They are used in minor sprains to relieve pain and release vascular spasm, and thus allow earlier mobilization of the joint. In incomplete ligament tears and subluxation it is also of value in diagnosis since the ablation of pain will permit examination to be carried out more readily and will often be adequate for the taking of stress x-rays in the knee and ankle to determine the extent of abnormal mobility. They should never be used to "keep a player in the game" in which he would not otherwise be able to compete since this invites further injury and morbidity.

Summary

The most important aspects of football injuries is prevention by matching of opponents, proper training and conditioning, knowledge of game skills and elimination of the physically unfit or injured player.

Of those injuries which result, ligamentous injuries of the knee and ankle are most commonly the ones which remain undiagnosed or inadequately treated. Classification based on an understanding of the pathologic anatomy will go far to guide the team physician in his choice of treatment.

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ATHLETIC INJURIES—THORACIC AREA

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This is a lecture taken verbatim from a tape recording made January 19, 1959, at the Hotel Kenmore, Boston, Mass., at the E.A.T.A. clinic.

"I have been asked to discuss some of the problems associated with athletic injuries of the chest. I first want to thank Andy for inviting me to come to speak to you this morning. It is particularly interesting that I should follow on the program, the man who does all the work at Williams where I became interested in sports. I am sure most of us in the medical field who are interested in taking care of athletic injuries after our undergraduate days, do so because we basically have been interested in sports and hate to give it up.

In my own particular sphere of general surgery, particularly surgery of the chest, I do not get an opportunity to see too many, fortunately, athletic injuries. So, in an effort to keep on with my interest in sports, I have taken on work at Harvard and have been working with Andy for the past two or three years on the hockey team.

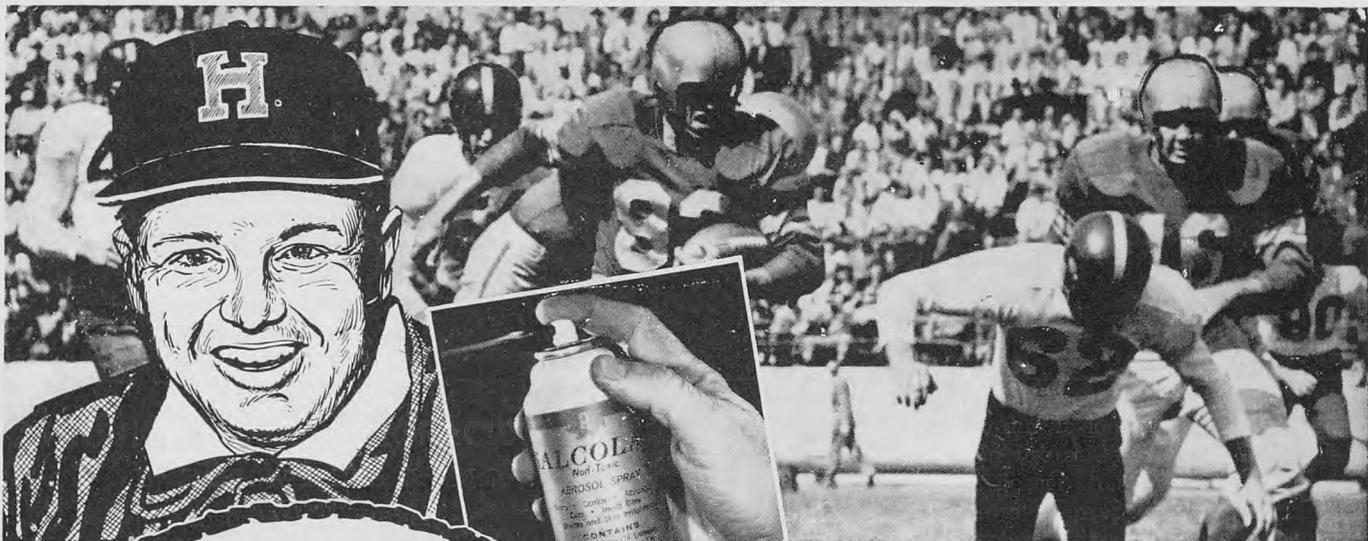
You have just heard a talk about an area of the body where injuries more commonly occur following various types of athletic injuries. We don't see too many injuries of the chest. We see a great deal of them in civilian practice particularly now with increasing incidence of high speed injuries. We saw a great deal of them during the war years. We see not too many in this area but in some cities of the country there are many gun shot or stab

wounds of the chest, so that it does develop into a distinct specialty of its own. In the athletic world they are uncommon and no one person has any vast experience. However, we all have to be prepared to meet any type of injuries which can occur to the chest. Any freak injury can occur. For instance in the past year I have seen two patients who had been hurt in fencing of all sports, one where the foil (I believe that is what it is called) broke and pierced the chest of the opponent, and another in which the foil actually went up the sleeve and pierced the axilla and caused a penetrating injury of the chest.

There was the incident in one of the nearby preparatory schools this past spring, where a boy was struck in the side by a javelin. Actually the injury was more below the diaphragm but certainly the problem of the thoracic injury was present. When you consider the various sports, particularly the more rugged contact sports of football, rugby, and hockey, you can see that you can develop all sorts of injuries of the chest. When you consider particularly the sport of hockey, it is amazing that you don't see more injuries because you have boys running around with two blades on their feet, a stick in their hand and a hard puck which they are inadvertently shooting at each other. But, fortunately, because of protective padding, we don't see too many injuries. Most of the injuries when they occur do require actual attention by a doctor but many of you are the ones on the scene when these injuries occur, and a broad knowledge or even first aid knowledge only, of the various injuries is essential.

I am not going to try to take up a whole hour talking about the subject. I would rather leave time at the end so that if you have particular problems we can have a question and answer period and try to cover them all.

Continued on page 12



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ATHLETIC INJURIES (Continued)

By convention we do not include the shoulder and the spine in thoracic injuries, primarily because these are covered by the orthopedic surgeon, even though they are in the immediate area of the chest. I would like to start with the more simple injuries, the ones we see more commonly in practice and the ones that are not too difficult to manage, and then proceed as the hour goes along to the more complicated injuries including some of the internal injuries of the chest. The majority of the injuries that we do see are actual contusions, contusions of soft tissue, muscle and bone of the chest wall and these don't present any particular problem. I suppose we subject a great many of our athletes to our standard treatment which is the immediate application of ice, and then the application of a compression bandage. We do these many more times than is absolutely necessary. On the other hand if we can materially cut down on time loss in one out of 10 we can accomplish something, because it is a simple thing to do.

In all of our boys, at least those that report that they have had a serious contusion, we do immediately put on ice and a compression bandage. Now the chest isn't as easy to put a compression bandage on as it is on your extremities, but if you don't have interference with respiration, if you don't have a true fracture of the rib, we have no hesitancy in actually putting a circular bandage around the chest. Or, we can apply a good compression bandage by taping elastoplast, without making it completely circular.

Now, if the boy comes back the next day, or two or three days later, and presents a definite local contusion which is painful, which has perhaps been untreated in the first place, and he has developed a real hemotoma, there has been the increasing use of injections of a combination of local agents with which you are probably all familiar. We have a particular "cocktail" that Dr. Quigley has been interested in using at Harvard. We haven't had enough experience to evaluate just how important it is but in certain instances it certainly has been helpful. This is the use of a combination of three drugs. First of all novocaine, which cuts down on the instance of pain which they already have or the pain which you produce by your injections. Secondly, hydrocortisone which results in a decrease in the inflammatory element, and thirdly, the enzyme hyaluronidase or hydase which promotes the local reabsorption of fluids and damaged tissue products. The dosage is 25 mg. of hydrocortisone, 100 units of hydase in 4-5 cc, 1% procaine. This "cocktail" can be all mixed together and administered to the site of the injury and in some instances we have been rather impressed with the results.

We do see definite muscle strain in the thoracic region. These are not common. The particular muscles that we do see involved are first the latissimus dorsi and then the pectoral muscles. Both of these are basically muscles utilized in the motion of the upper extremities, but they are accessory muscles of respiration too, and have their origin to a large extent from the bony cage. In addition the other two muscles that we see involved are two respiratory muscles, the serratus and the intercostal muscles. The latter two in particular are difficult to diagnose and particularly difficult to differentiate from actual injuries of the bony cage. Their symptoms may be a lot like the symptoms of fractured ribs. Only by the use of X-ray can you make a differential diagnosis from a fracture. The specific tests are obvious to differentiate the first two muscles that I mentioned that is, of the use of protraction and retraction of the shoulder against pressure. Usually the diagnosis of these two can be established rather readi-

ly. Here the use of injection of these agents that I mentioned has not been nearly as impressive. Strapping, heat, massage and so on of course are applied but, I have the feeling it is pretty much a matter of rest and time before you get these boys into their active sports.

We do see actual muscle rupture, particularly of the latissimus muscle. We see this more often in older people in non-athletic injuries from such incidental motions as coughing. An older person merely in a violent fit of coughing can actually tear the latissimus muscle. They can further even produce a fracture of the rib at the point of attachment. So we have to be careful in analyzing these patients who talk about severe pain resulting from an incidental injury to be sure that they really mean that they are having difficulty and not that they're malingering or over-exaggerating. I have yet to see this sort of thing in a young athlete however.

Occasionally we run into the long-term complication of muscle injuries, those that fall into the broad term of myositis and fibrositis, and again here we have had some luck in the injection of the "cocktail" mixture in reducing the length of time in which they're inactive. One of the orthopedic groups in town has also been impressed, (I have not seen this reported elsewhere) with the use of a drug called butozolidene in the treatment of these prolonged painful muscle syndromes.

Now to get over to some of the more serious injuries of the chest. We will start with the fractures of the bony thorax. These are again relatively uncommon in athletic injuries. Dr. Thorndike in his book surveyed the fractures that occurred at Harvard over a period of 22 years from 1932 to 1954 and you may be interested in those fractures because, of 624 total fractures seen in that time there were only 16 fractured ribs. I was not working at Harvard prior to 1954, but this particular figure seems awfully small to me when you consider the length of time involved. I am sure I have seen half a dozen of them in the past 3 or 4 years, but none the less, fractures are not common. This represented, of this particular series, only 2½% of the total number of fractures.

To give you the rest of the figures if you are interested, most of the fractures, are fractures of the fingers or hand, or of the bones of the face and constitute roughly 50% of that total series of 600. Leg and ankle fractures accounted for 15% and the arm accounted for another roughly, 15%.

The clavicle, although it is not basically considered in the injuries of the chest itself, accounted for 13 or 5% of the total. This does not usually result in any thoracic complication, although once in the past year, we had a student at Harvard, not as a result of an athletic injury, but as a result of an automobile injury, who did have an unusual complication. A complete achromio-clavicular separation accompanied a fracture of the clavicle. This resulted in a completely loose lateral fragment.

He had at the same time a major internal injury of the chest, a major pneumothorax, actually with the accumulation of blood too, making it a hemopneumothorax. He did not have as far as we could tell from careful survey, evidence of a fractured rib. The presumption is, although I have not seen it reported nor had Doctor Cave, who headed the Fracture Clinic at the Massachusetts General Hospital for years, he had a perforating injury of the pleura and lung from a fragment of a fractured clavicle. I believe it can occur, and we must be aware of that possibility. It is a simple matter when you are looking at your film for the fractured clavicle to look for the pneumothorax at the same time.

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ATHLETIC INJURIES (Continued)

There was only one major fracture involving the chest structures in this 22 year period and that was a transverse fracture of the sternum. This is a rather common civilian injury that we see in steering-wheel accidents when the driver of a car in collision incurs a blow against the sternum by the blunt shaft of the steering-wheel. These are major injuries. They are extremely painful injuries. They're major because primarily of the associated injuries which occur in the mediastinum behind the sternum.

Now to spend a little bit more time on the problem of rib fractures. We have to suspect the rib fracture primarily on the basis of the boy's symptoms, that of pain on breathing, pain on deep inspiration which is actually pleurisy, and until you have a chest film which demonstrates that there is no fracture, it must be handled as such. The only real treatment that you can carry out for a fractured rib that is on an ambulatory basis, is that of relief of the person's pain by a method of strapping or immobilization of the chest. This can be accomplished in a number of ways. There is a great difference of opinion even among men who are devoting their time to civilian injuries of the chest in just which manner this should be carried out. I was brought up on the teaching that what you accomplished, no matter where the fracture, whether it was up of the top ribs of the chest or down lower, was to bring about splinting of the chest wall by taping of the lower portion of the chest; in other words, from the nipple line down, so that what you prevented, was the expansive motion of the chest cage during inspiration. Certainly this is a comfortable way of strapping a chest. There are those who believe you shouldn't strap in a circular fashion, but should do your strapping in the direction of the ribs, which

is from a position of high behind, to low in front. I have had no experience with this. I presume it accomplishes basically the same thing.

Dr. Thorndike in his book and in his practice mentions using elastoplast or a similar type of substance for strapping of the chest. I much prefer the standard old-fashioned adhesive, particularly the 4" width because it does give me a little bit more stability in my strapping than I can get with elastoplast. I personally don't like to use a circular, completely circumferential type of strapping when a patient has a fractured rib. They are already having difficulty breathing with the lung on that side because of pain in the chest wall and if you splint the opposite side by carrying the strapping all the way around, you can limit, possibly to a dangerous degree, their respiratory motion. Not that they can't get along with adequate breathing and oxygenation, but this does promote the accumulation of secretions in the bronchial tree and promotes the possibility of complications in the form of atelectasis or pneumonitis. These are things we worry about in older people, particularly people we subject to thoracic operations but they're problems we must give our thought to in handling of younger athletes.

The usual fracture that we see is the simple linear fracture without displacement, and in these, strapping until the boy is free from discomfort and the use of a protective type of arrangement of padding is sufficient to allow them to get back into contact sports probably within a period of three weeks. However, if there is a displacement of the ends of the fracture of the rib and particularly as they often occur with an angulated sharp spicule of bone, with the possibility of underlying more serious injury these boys should not be allowed back into

Continued on page 14



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ATHLETIC INJURIES (Continued)

contact sports until a much longer length of time. I myself am conservative, and wouldn't allow them back in the same season in which they are participating. Certainly, a five or six week period is a minimum.

There are thoracic surgeons who believe that any fracture of the rib which has any displacement at all should be subjected to open reduction. This can be done but I certainly do not think that it is something that need be done in every single patient the way some prescribe. If there is evidence that the spicule of bone looks as though it may endanger the lung underneath or if there is more than one rib fracture or more than one fracture in a given rib, then there is more reason to consider such open intervention to stabilize the chest wall.

We do see as a result of serious contact injuries, or in skiing injuries where someone runs into a tree, the type of fracture where you have a row of fractures in the front and a row of fractures behind leaving a segment of the chest wall, which is basically unstable, which is a frail piece of chest wall which allows what is called paradoxical respiration. This is where the patient inspires and this segment of chest wall will move in and then when he exhales it moves out instead of in the direction with the rest of the chest wall. In this particular instance some form of immobilization is necessary. This may take the form of open reduction under local anesthesia, with actual wiring of the ends of the rib or it may take the form of the placement of a wire traction suture under a rib in the center of this which can be put up to a pulley on the Balkan Frame, to allow immobilization in this manner.

The major problems however, are not those of the rib themselves, but of the lung underlying lung and the problem of pneumothorax. Although again it is not a common injury. Certainly it is a problem that has to be entertained at any time in which you are faced with fractures of the ribs. Certainly it should be looked for in every rib fracture and to look for it properly by X-ray, you must take a film in maximum inspiration and another in maximum expiration. This is the maximum which the person can accomplish with a painful chest wall. I will talk a little bit later about pneumothorax that we do see in the absence of actual visible fractures of the rib. Certainly any person that has a pneumothorax as a result of a fracture should be hospitalized. We do not believe these boys should be treated as ambulatory patients. The problem that we do not know at the time we see them is whether this pneumothorax is increasing or not. Now if you pick it up a day later or several days later, as we occasionally do, that is a different situation because then the situation is stabilized and it may be perfectly reasonable then to follow them on an ambulatory basis.

We had one such incident two years ago when one of our hockey players, who was playing back home in Canada during Christmas vacation and had suffered a heavy blow in "check" and had done nothing about it, and had stopped in to see us at the field house, because he just didn't feel right on that side. He had a heavy feeling. It turned out that he had a pneumothorax amounting to perhaps 30% collapse of the lung on that side. But, then roughly a week after the injury, there was no point in putting him in the infirmary or the hospital. We allowed the lung to re-expand of its own accord and he was allowed to participate again after a total of three weeks absence.

In the acute injury, which is accompanied by pneumothorax, the person must be hospitalized because you

can develop a gradual total pneumothorax on that side, which in a young person in itself is not terribly serious, but if they are unfortunate enough to develop what is called a tension pneumothorax in which they develop air in the thoracic space on that side under pressure then, the heart and the contents between the lungs, the mediastinum may be pushed over to interfere with breathing by the remaining good lung. We have seen unfortunately, even under observation in the hospital, this sort of a complication arise with drastic outcome. This is the necessity for keeping them under observation in the hospital and not only just in the hospital, but they must be observed very frequently and continuously. If they show signs of increasing pneumothorax, increasing collapse of the lung, we then carry out a needle aspiration to remove as much of the air as we can. This accomplishes two things. You can see that if there is still a leak of air from the lungs and we aspirate with a needle and a syringe, there won't be any end to the air we can aspirate out because it will be coming through his trachea and out into the pleural space and then we'll take it out with our needle and this will go on. So, it gives us a little bit of an idea as to whether there is a continuing air leak or not. Secondly it does promote the re-expansion of that collapsed lung. If we find that we are dealing with a continuous air leak, then we subject the patient to still further procedure, that of the insertion of a tube into the chest, usually an ordinary catheter, which is then rigged up to a negative suction, negative pressure apparatus, to allow constant suction, to allow evacuation of that air.

Rarely we have actually had to take the patient to the operating room and do a full-scale opening of the chest or thoracotomy to suture a persistent leak. This is an extremely rare bird in athletic injuries fortunately.

Now, if the injury to the rib is accompanied by damage to an intercostal vessel or other major vessel, we then have the added problem of blood in the chest, a so-called hemo-thorax. These again are uncommon in our experience in athletic injuries but are very common in our other civilian injuries that we do see. Usually oddly enough, an injury to the major vessels of the lung will stop itself in time. Whereas, an injury to an intercostal vessel may leave persistent bleeding which will require surgical intervention to stop it. This is because by the nature of the physiology of the human being, the pressure in the part of the arterial system which supplies the intercostals is much higher than the pressure in the vessels supplying the lung. But, usually both the leak of a pneumothorax and the bleeding from a hemothorax will subside spontaneously.

Blood in the chest however, must not be left there. We cannot treat that conservatively and allow it to gradually reabsorb because this will result in a late development of a so-called peel of fibrin on the surface of the lung, which will not allow adequate expansion of the lung and will lead to an ultimate surgical procedure in which this peel is removed (decortication). So, if they develop a hemothorax of any magnitude, this must be removed rather promptly.

Those patients who have severe pain resulting from rib fractures can be helped a great deal by actual novocaine blocks of the intercostal nerves. This is carried out in the back along the spine in which the nerves of not only the rib involved, but the two ribs above and at least two ribs below are injected with 1% procaine or more recently with xylocaine and they do have during the course of the action of these drugs freedom from pain which allows

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ATHLETIC INJURIES (Continued)

better breathing and better coughing to get rid of the secretions which they accumulate.

If you have an injury in which you're confronted with the obvious phenomenon of flail chest, the most important thing to do is to put some sort of a pad, usually thick gauze or felt, over the area and strap that side of the chest very tightly. This then allows the patient to breath more normally and gives them some degree of comfort until they can be hospitalized. These are extremely painful conditions, even when nerve blocks are carried out and they require a large dose of narcotic medication which in itself has its complications which I won't go into. In this situation, as I said earlier, they can be greatly relieved by operative reduction under local anesthesia with wiring of the ends of the rib.

Whenever we are considering rib fractures, we have to consider other injuries of internal viscera to go with it. As you readily see, the ribs extend a good deal below where the lungs actually lie. We generally talk about the thorax as being separated from the abdomen by the diaphragm. On the other hand, there are structures within the abdomen cavity which lie within the confines of the ribs and technically are within the thoracic cage. Particularly, I am talking about the spleen and the rupture or fracture of the spleen is one of the major athletic injuries. We do see one, two or three cases every year in any athletic program where there is a large participation. This should be suspected whenever anyone complains of a blow over the lower ribs on the left side. On the right side, the liver can similarly be injured, but this is not nearly so serious a problem as a fracture of the spleen. A final entity is the problem of a painful slipping rib cartilage which may be confused with other diseases of the abdomen, gall bladder disease or duodenum ulcer or something of that kind. The pain is not recognized unless attention is directed to this possibility of producing abdominal pain and unless a careful history is taken it will be missed. It is important because it's a very simple thing to correct. It's a simple thing to make a small incision under local anesthesia and excise this piece of cartilage which actually rubs against the rib above or below.

Now to spend just a little bit of time on the more major injuries of the chest. Not that you are going to have much to do with these but they can occur and what to do about them when they occur is important. They are basically injuries which require hospitalization. The first of these, to bring it up again is the problem of pneumothorax and I bring it up at this point to mention the fact that it can occur as a result of injuries without definite fracture of the rib. This results from a major contusion of the chest wall with a contusion of the underlying lung, causing an actual tear in the surface of the lung. Or, it can occur purely by coincidence and we see increasing numbers of these in younger people, people without previous diseases of the chest, what is known as a spontaneous pneumothorax. We have, I suppose, three or four of these every year in Harvard College, of students who basically do not realize that they've had any abnormality in their chest at all, who sometimes in their sleep, sometimes when they're exercising, develop a spontaneous pneumothorax. This results from a rupture of a so-called "bleb" or a blister-like structure on the surface of the lung which is either a congenital affair or may result from previous infection of the lung. It is known to occur after pulmonary tuberculosis. This will then lead to a major air leak and a major pneumothorax. These people we treat in the manner I

mentioned before. We try to avoid open operation on them if we can although they are subject to recurrent episodes and we've adopted more or less the policy that a young person who develops a second spontaneous pneumothorax should be operated on to prevent further episodes. Roughly 70% of those who have a single spontaneous pneumothorax will not have one again but of the remaining 30%, sooner or later they are going to have trouble if this possibility is not prevented as you can do merely by excising that "Bleb" that causes the pneumothorax.

Hemothorax we mentioned also with fractured ribs but also can occur without actual demonstrable fracture of the rib. It can occur merely by a severe contusion of the chest wall resulting in bleeding from an intercostal vessel.

If you read any discussions of chest injuries you will find listed a whole host of other injuries that can occur. You will read about the person who was struck in the anterior chest wall by a golf ball who suffered a cardiac (heart) injury just like a person who has a coronary attack. It has also been reported that a blow on the anterior chest wall in similar manner has caused an actual heart rupture and sudden death of the patient.

One other injury of the chest which I haven't mentioned, I personally hadn't run across before this past year and, as these things do happen, I have seen two or perhaps three in the past year, this is rupture of the trachea. The two definite ones were in young boys, not in college age students. Both of these occurred not in organized athletics, but occurred when boys were wrestling with each other in which a sudden blow was directed to the lower part of the windpipe just above the sternum in front. This resulted in severe pain initially accompanied by difficulty in breathing. The diagnosis was readily made by the time they were brought to the hospital because they, as a result of the tear in the trachea, had leaked air out of the windpipe into the tissue of the neck and by the time they were examined both of these people had air which you could feel in the tissues of the neck and overlying the shoulder. This, if it's extreme can go on to the extent of feeling it up along the cheeks and actually all the way down along the chest wall as far as the hip. These people can really get blown up until they literally look like a balloon.

Certainly, in these two that were definitely diagnosed, we were able to get along without active intervention merely by controlling their pain but being ready if they got into difficulty with breathing to do a tracheotomy. But, certainly a blow to the neck just above the sternum can result in an injury to the trachea and can result in this problem of subcutaneous emphysema which may go on to actual obstruction to breathing and require tracheotomy.

The other patient, in which it was not proved was a hockey player who was playing in the intra-mural house league at Harvard who was subjected to one of these freak injuries. He wasn't checked although it amounted to a check. He was coming off the ice and one of his teammates was coming on the ice and they collided right at the boards. He took the brunt of the 200 pounder's shoulder right in the trachea region above the sternum. He never did develop subcutaneous emphysema but did develop an extreme amount of swelling. We were sure that he developed a hematoma in the thyroid gland. He developed hoarseness so that you could hardly hear him talk. We never had to do anything active in the way of surgical intervention here. We must bear in mind that trachial injuries can occur both in the neck and actually

ATHLETIC INJURIES (Continued)

can occur inside the chest.

We have been seeing increasing numbers of these in automobile accidents where a person will actually completely sever one of the major bronchial tubes from the trachea in an accident. This of course results in a very prompt major pneumothorax under tension and requires very prompt and active operation.

I don't believe I'll go into any more of the freak injuries that we do see. I would much rather have you question me on any problems that you may have had from your own experience or that you might possibly run into. I think we'll close it there.

Question: Inaudible.

Dr. Wilkins: The chances are probably less than 50-50 they never will completely stick down again to the sternum. I would not however on that indication go ahead and operate on it. I'd give it time to see what develops. I think anyone who gets that degree of separation is out of that particular sport and that is one of the major problems you are all up against in getting the athlete back into action as soon as you can. But, if you had a true costo-chondral separation, I think they should be through for the season to give you time to see if it's going to heal of its own accord. If it does, fine, if not, then it can be excised. I suppose that if you know ahead of time that it wasn't going to, you could excise it and have the person back in combat a lot sooner. I am not that surgically minded however. It is a difficult diagnosis to make short of actual palpable separation and many times they get an actual sprain at this joint in which case they could be handled by lesser means, strapping, etc.

Question: Inaudible.

Dr. Wilkins: How could it occur? You can get this problem of the anterior and of the lower rib becoming separated from the costal margin, a true costal-chondral separation. I don't know how you would set that. It doesn't sound quite right to me either.

Question: Inaudible.

Dr. Wilkins: Of course lay persons are almost prone to talk about having something out of joint that you can't demonstrate particularly when they are talking about the back. It is just their way of describing their particular injury. I doubt that it occurs in the ribs.

Question: Doctor, when the boys are around school or in class nothing bothers them but as soon as they exert themselves they seem to have a lot of trouble.

Dr. Wilkins: But any exertion, it isn't a question of further contact of that area?

Question: No, any exertion at all. I have had two of them and they gave me a lot of trouble and I just couldn't figure it out.

Dr. Wilkins: Well, I have always gone under the assumption that this was due to the fact that the area was painful and then as you breath twenty times a minute you are moving this area and you can't immobilize the chest like you can immobilize an extremity. And, when you subject them to an extreme amount of exertion and they get breathing deep and rapidly they will notice pain in that area. Pain then sets up a reflex which makes it difficult for them to breath. That's just a normal sort of a reflex that is set up. I don't believe that it means there is necessarily any underlying injury. It is a matter of pain in the particular point of the contusion.

Question: They become completely exhausted, I mean

they were gasping for breath.

Dr. Wilkins: Well, it is a reflex phenomenon set up by the local pain stimulus when they increase their respiratory rate and the respiratory excursion.

Question: Inaudible.

Dr. Wilkins: They are injuries that are abdominal blows particularly and not chest injuries, and there it is primarily a question of just letting them rest long enough until they spontaneously have a return of their ability to breath. If there is any question of a blow to the chest causing this, then I think you are open to criticism if you allow them to go back until that area has been X-rayed, because you cannot clinically make a diagnosis of a fractured rib, you have to have film.

Are you referring particularly to chest blows as opposed to abdominal ones?

Question: I was merely wondering about the proper way of handling a boy on the field to prevent any aggravation of an injury from some of our vigorous methods of reviving the air.

Dr. Wilkins: Well, there are all sorts of customs that have come along about how to get a person to get his wind back. I personally believe in just letting him lie where he is. I certainly do not believe in the treatment that Andy and I saw a week ago carried out down at the "Garden," when the Russian hockey team was here, where they emphasized speed in getting him off the ice. They just picked him up whether he could move or not and carted him over to the bench. I think you have just got to interrupt what's going on and let him lie there until he starts to get his wind back and if it's going to be any length of time, put him on a stretcher and take him off. I don't personally believe in any active intervention.

Question: What about the use of oxygen?

Dr. Wilkins: The use of oxygen? Well, usually we don't have any indication for it unless it is one of these more serious injuries. You mean for getting knocked out?

NUTRITIONAL SUGGESTIONS FOR THE UNIVERSITY OF ARIZONA ATHLETES

1. Build each meal (even breakfast) around energy building **protein foods—eggs, dairy products, meats, fish, and fowl**. In addition to steaks, chops and roasts, take **liver at least once a week, also sea foods once or twice weekly**. NEVER SKIP BREAKFAST!!
2. **Recovery from possible injury will be expedited by intake of citrus fruits**. During the day drink one full glass of either un-strained grapefruit or orange juice.
3. **Whole wheat bread contains vitamins important to muscle formation**. Eat it rather than white bread, rye, pumpernickel or corn bread.
4. At any meal never take more than **two portions of any food high in starch and sugar**. If you have baked potato and bread, don't have pie or cake for dessert. Substitute fruit or occasionally ice cream. If you like a starchy dessert, eat green vegetable instead of the potato.
5. Eat a salad at both lunch and dinner—any kind of green salad.
6. **Steer clear of fried foods, particularly in restaurants**.
7. **Eat fresh fruits and vegetables** whenever possible as opposed to canned or frozen.

RICHARD CARR
Head Athletic Trainer

