

ATHLETIC TRAINING

THE JOURNAL OF THE NATIONAL ATHLETIC TRAINERS ASSOCIATION

IN THIS ISSUE:

Athletic Training Awareness How to Write Articles for the Journal Schering Symposium: Problems of the Extensor Mechanism Policies and Procedures Are Necessary In the Training Room The Ruptured Spleen: Implications for the Athletic Trainer Constitution of the National Athletic Trainers Association Index to Volume Thirteen

VOLUME 13 NUMBER 4 WINTER 1978



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The National Athletic Trainers Association

President William H. Chambers Fullerton Junior College Department of Athletics Fullerton, California 92634



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FROM THE PRESIDENT



Dear N.A.T.A. Members:

Best wishes to each of you for a prosperous year in 1979 and I hope the new year will bring professional growth for you and for N.A.T.A.

Last August in Pittsburgh a task force from N.A.T.A. met with a task force from A.P.T.A. to discuss areas of mutual concern. Both groups felt a lot of positive dialogue took place and that it was a good and positive meeting. I am hopeful we will be able to meet with them again this spring to further discuss these areas of mutual concern.

I'm sure most of you are as concerned as I am about the recent magazine and newspaper articles that have tried to sensationalize certain areas of sports medicine and athletic training. Perhaps it would be a good idea for all of us to re-evaluate our particular role and make sure we are functioning within the working definition of an athletic trainer.

The moratorium on any new licensure is still in effect. When we meet in St. Louis there should be some up-dated information in regard to this. Some states already had licensure bills introduced when the moratorium was requested and in response to inquires from these states, I informed them to proceed with their licensure efforts if their bills had been introduced prior to the request.

In closing, I hope in 1979 each of you will try to contribute in some way to the betterment of our Association and profession. Your suggestions or comments will help your District Director represent you.

Sincerely,



William H. Chambers



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calendar of events

JANUARY, 1979

13 University of Delaware's Tenth Annual Medical Aspects of Sports Seminar, Newark, Delaware. Contact C. Roy Rylander, Athletic Department, University of Delaware, Newark, Delaware 19711.

17-19 Winter Sports Medicine, Dartmouth-Hitchcock Medical Center and Ohauquechee Health Center, Woodstock, Vermont. Contact Office of Continuing Medical Education, Dartmouth-Hitchcock Medical Center, Hanover, New Hampshire 03755.



FEBRUARY, 1979

16-17 Southeast Chapter of the American College of Sports Medicine Meeting, Atlanta, Georgia. Contact Harvey Murphy, HPE Department, UNC at Charlotte, Charlotte, North Carolina 28223.

20-23 American Orthopaedic Foot Society Meeting, San Francisco, California. Contact R.A. Mann, M.C., 5495 Fernhoff Road, Oakland, California 94619.

MARCH, 1979

14-17 Sports Medicine Congress - "Sports in the Tropics", Pan American games Organizing Committee, Sports Medicine Division, San Juan, Puerto Rico. Contact VIII Pan American Games, Organizing Committee, Sports Medicine Division, G.P.O. Box COPAN 19, San Juan, Puerto Rico 00936.

17-18 12th Annual Sports Medicine and Conditioning Seminar, Sponsored by The Sports Medicine Clinic, American Osteopathic Academy of Sports Medicine, Northwest Sports Medicine Foundation and Seattle Pacific University, Seattle, Washington. Contact Keith D. Peterson, D.O., The Sports Medicine Clinic, 1551 Northwest 54th, Suite 200, Seattle, Washington 98107.

Athletic Training will be happy to list events of interest to persons involved in sports medicine, providing we receive the information at least two months in advance of publication. Please include all pertinent information and the name and address of the person to contact for further information. This information should be sent to Jeff Fair, Athletic Department, Oklahoma State University, Stillwater, OK 74074.



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(Left to right: Tom Ehlers, line backer, Otho Davis, trainer, Vinc Papale, receiver, Philadelphia Eagles)

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book reviews

Principles of Anatomy and Physiology

by Gerard J. Tortora Nicholas P. Anagnostakos List Price - \$16.50 624 pages - Illustrated Harper & Row Publishers, Inc. 10 East 53rd Street New York, New York 10022

This text is designed as an elementary introduction to the principles of human anatomy and physiology. It does not assume any previous study of the human body or its function. It is primarily directed to students in allied health fields such as nursing, physical therapy, physician's assistant, etc.

The text embraces two major hemes, homeostatis and pathology. The student is shown how normal anatomy and physiology is maintained by the dynamic homeostatic mechanism of the human ody. Pathology is viewed as a disruption of this homeostatic mechanism. A large number of clinical topics are presented and contrasted with specific normal processes of the body.

The book is organized into five principle areas of concentration. The first area, Organization of the Human Body, is designed to provide an understanding of the structure and function of the body from molecules to organ systems. Principles of Support and Movement, analyzes the anatomy and physiology of the skeletal system. Articulations and skeletal muscles are reviewed as is the histology and physiology of cardiac and smooth muscle. Control Systems, the third area, emphasizes the importance of the nervous and endocrine systems in the maintenance of homeostasis. Factors that affect conduction across synapses are discussed. In the chaper dealing with the endocrine system, emphasis is placed on the regulation of hormone secretion through feedback systems and a flowchart is presented for each of the various systems.

The fourth major area, Maintenance of the Human Body, provides a discussion of daily body activities such as digestion, respiration, urine production, etc. The presentation of blood pressure is the last major area of emphasis and in this final section the relationship of the endrocine system to sexual development, the ovarian cycles and the maintenance of pregnancy is discussed.

The text is clear in its presentation of the material. Many illustrations and roentgenograms are used to clarify the written explanations. Whenever possible unnecessary complicating scientific jargon has been eliminated. A basic clinical vocabulary has been presented however, and glossaries of selected medical terminology appear at the end of most chapters.

Don Kaverman, A.T.,C.

Conditioning for Distance Running

by: Jack Daniels Robert Fitts George Sheehan List Price: \$9.95 106 pages - Illustrated John Wiley & Sons, Inc. 605 Third Avenue New York, New York, 10016 It is difficult if not impossible to prescribe a training regimen that is suited for all. The authors of this text, however, have attempted to bridge the gap between the misinformation being directed at distance runners and the latest findings in physiology, nutrition and sports medicine. It is their commitment to enlighten the readers of this text as to the scientific aspects of training for distance running.



The book is divided into seven sections, each dealing with a general consideration in the conditioning for distance running. The first section examines the effects of endurance training on the neuromuscular, cardiovascular and respiratory systems. There is also a brief reference to endurance trainings' effect on the bones and connective tissues.

The second section deals with metabolism and examines the relative importance of aerobic and anaerobic metabolism in endurance conditioning. The effects of the environment are examined in section three while the fourth section explores the acute and chronic dietary needs of athletes involved in this type of conditioning.

Training techniques comprise the next section with a discussion of types of training and their relative importance in formulating a successful endurance training program. Aerobic and anaerobic training as well as pace running and hill running are discussed. Section six examines the clinical aspects of distance running and the final section attempts to establish a profile of an endurance running champion. Body build, age, experience, 0² consumption and aerobic capacity are correlated in an attempt to generalize as to the common characteristics seen in successful distance runners.

This is a short book but contains a wealth of well documented information specific to distance running and endurance conditioning. It would serve as a valuable addition to any sports medicine library.

Don Kaverman, A.T.,C.

Endurance Fitness

by Roy J. Shephard List Price: \$9.95 380 pages - Illustrated University of Toronto Press 33 East Tupper Street Buffalo, N.Y. 14203

This text represents the second edition of Dr. Shephard's study of the physiology of endurance fitness. It begins with a discussion of various cultural patterns of physical activity and attempts to explore the development of fitness as a scientific concept. A review of this material provides the reader with historical documentation as to the development of current concepts of fitness.

The author then explores the physiological determinants of endurance fitness such as the oxygen cost of breathing, pulmonary diffusing capacity and cardiac output. The methodology of fitness tests is reviewed including protocal for the measurement of specific physiological parameters such as oxygen consumption, heart rate and blood pressure.

Current levels of fitness are explored as to the characteristics of specific populations, regional differences in physical performances and the effects of growth and aging on max VO^2 in different communities.

The author also discusses modification of fitness. Types of training regimen, the optimum pattern of continuous training and the safety of training regimens are reviewed. Studies of attitudes toward physical activity and food intake and motivation necessary to increase physical activity in part comprise an overview of current activity

(Continued on page 217)



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Athletes who have never exercised the ankle previously usually start at weights of 5-15 pounds for eversions. So far athletes have progressed to the 30 - 40 pound range. Maximum resistances are still unknown. Dorsiflexion and inversion are usually a little easier. Plantar flexion is seldom used because toe raises are more applicable and affords a greater range of motion.

Editor's Note: Anyone wishing to have an idea, technique, etc., considered for this section should send it to Rod Compton, Sports Medicine Division, East Carolina University, Greenville, N.C. 27834. Copy should be typewritten, brief and concise, using high quality photos and/or illustrations.









The 1978 Schering Symposium on the Knee

Problems of the Extensor Mechanism

by ROBERT L. LARSON, M.D. Edited by ROD COMPTON, A.T.,C.

East Carolina University



The patella has basically two functions. One is to increase the extending momentum of the quadriceps pull and thus the strength of the quadriceps in extension and, secondly, to protect the front of the knee and provide a smooth surface for the extensor mechanism to glide distally over the front of the femur with knee flexion and extension. The patella is stabilized in this action by both dynamic and static elements. (Fig. 1) The dynamic stabilizer is primarily the vastus medialis obliquus muscle which centralizes the patella in its groove. (Fig. 2) This muscle acts through the attachment of the quadriceps tendon superiorly and the patellar tendon inferiorly, holding the patella in its groove as the quadriceps contracts.

The pes anserine muscle group also helps to maintain alignment of the patella with the femoral sulcus by the internal-rotary action on the proximal tibia, helping to maintain the alignment of the tibial tubercle with the femoral sulcus.

Static stabilization of the patella is provided by the bony contour of the femoral sulcus with the high lateral condyle and the depth of the sulcus as well as by the triangular shaped configuration of the patella. Thickenings of the retinaculum, called the patellofemoral ligaments, extend on each side of the patella to attach to the femoral condyles, acting as guy wires to guide the patella as it glides through the femoral sulcus. The medial patellofemoral ligament helps prevent lateral displacement and when dislocation of the patella has oc-

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curred, this ligament may be stretched or disrupted. The lateral patellofemoral ligament is in some cases contracted producing excess pressure and irritation to the articular surface of the patella with flexion of the knee.

Patellar Tendinitis - "Jumper's Knee"

Patellar tendinitis is seen relatively frequently, particularly in the running athlete and those individuals producing excessive quadriceps contraction in a repetitive manner such as long jumpers and high jumpers. This has given rise to the eponym "jumper's knee". The most common symptom is localized discomfort over the proximal or distal patella at the attachment of quadriceps or patellar tendon. There may be aching after exercise. Often the discomfort becomes progressively worse and occasionally swelling may be noted at the area of involvement. The etiology of the condition is from repeated stress at the tendon insertion on the patella, producing microruptures with local tendon degeneration and the onset of inflammatory response. The traction is produced not only by the contraction of the quadriceps muscle but also by the extremes of the external rotation of the tibia on the femur and may be enhanced by such conditions as genu valgum or pronation of the ankle which enhances the traction at the tendinous insertion of the patellar tendon to the patella.

The biomechanics of the running phase shows there is an isotonic quadriceps contraction producing a sudden explosive burst of speed as the runner springs from the blocks or the high jumper initiates a jump from the takeoff leg. At this phase, the knee is extending and the tibia externally rotating on the femur. The quadriceps contraction along with the external rotation of the tibia done repetitively may produce the irritative tendinitis and the secondary pathology which occurs.

Physical findings include tenderness and swelling. Roentgenographic evaluation may show a slight periosteal reaction around the involved pole of the patella, elongation of the distal pole, irregularity, or stress fracture, however, often there is no evidence on x-ray evaluation of bony problems in this area.

Treatment is primarily conservative. The basic treatment is rest to allow the inflammatory process to subside. In the acute phase, inflammatory agents, such as oxyphenobutazone or phenylbutazone may help to shorten the inflammatory phase. When activity is resumed, icing the tender areas after work outs is helpful to reduce recurrence of the inflammatory response. If any contributing cause can be determined, such as excess pronation of the foot, or malalignment of the extremity appropriate measures should be taken such as the use of a shoe orthotic to decrease the obligatory pronation and tibial external rotation which occurs with such basic deficiencies. Elastic knee supports will sometimes help to decrease the traction pull of the quadriceps on the patella (Fig. 3) A non-elastic distal thigh strap may also decrease the excursion of the quadriceps muscle and lessen tension.

If the condition does not respond to conservative treatment over a reasonable period of time and if the disability is great enough to warrant further approaches to a cure, a surgical procedure can be considered. Several methods have been described. The tender area may be exposed under local anesthetic with splitting of the patellar tendon vertically at this spot and the area curretted of any necrotic tissue. Drilling the lower pole of the patella has been another method suggested as treatment. Resection of the distal pole of the patella with reattachment of the patellar tendon at this point has been used in extreme cases.

Patellar Compression Syndrome

There are a considerable number of patients with patellar symptoms in which no evidence of patellar instability or malformation can be detected. The patient may complain of vague discomfort around the patella or anterior aspect of the knee often related to activities requiring repetitive flexion such as skiing or jumping. Occasionally facet tenderness is present.

Roentgenograms are usually negative, showing none of the stigmata of dislocation or maldevelopment of the extensor mechanism. There may be occasional slight lateral tilting of the patella in the patellofemoral groove. Such patients have been categorized to have a "patellarcompression syndrome". Their discomfort is due to a tightness of the lateral patellofemoral ligament causing increased compression of the patella as it moves through the patellofemoral groove. Contributing to the tightness is the vastus lateralis which attaches to the superior aspect of the lateral edge of the patella. The direction of the muscle fibers are usually at an angle of 12 to 15 degrees lateral to the anatomic axis of the femur. When this muscle is shortened due to myostatic contracture or fibrosis, lateral displacement of the patella with increased patellar compression against the lateral femoral condyle with knee flexion may occur.

Conservative treatment consists of muscle stretching and quadriceps strengthening exercises and the use of a patellar stabilization support which helps to guide the patella more normally through the patellofemoral groove and decreases irritation. If conservative measures fail after an adequate trial period which usually is at least six months, a surgical procedure may be appropriate. A lateral retinacular release is done in a z-plasty manner with lengthening of the lateral patellofemoral ligament and release of the lateral portion of the vastus lateralis.

At the time of this procedure the synovium is opened and the knee joint inspected, looking for any evidence of chondromalacia on the undersurface of the patella. Such pathologic findings are usually not present with this particular syndrome. The condylar surfaces are evaluated for any evidence of erosion or osteochondral fracture as well as the interior of the joint for any evidence of meniscal



Figure 1

Patellar Stabilizers: A. Muscular (Dynamic) -1) Quadriceps - especially the vastus medialis obliquus, 2) Pes anserine group; B. Static -1) Joint contour and congruity, 2) Retinacula, 3) Patellofemoral ligaments, 4) Patellotibial bands, 5) Patellar tendon. (Anatomic specimen with anterior aspect on top; buldge in center is the patella; the vastus medialis obliquus is labeled 'VM'; tissue on right coming off anterior this is the pes anserine attachment.)



Figure 2

The vastus medialis obliquus muscle acts to dynamically pull the patella medially to keep it centralized in the femoral sulcus. The pes anserine group of muscles attaches to the proximal tibia on its medial aspect to internally rotate the tibia helping to align the patellar tendon with the femoral sulcus.



pathology. The z-plasty lengthening of the lateral patellofemoral ligament is preferred to a mere lateral retinacular release since it gives some support to the lateral side of the knee preventing fat or synovial herniation at this area.

Subluxations of the Patella

Subluxations of the patella often become manifest during the adolescent years as more vigorous activities are initiated. Almost all are associated with congenital or developmental deficiencies of the extensor mechanism. A study by Hughston showed that 90% of subluxations or dislocations in the athlete occurred by the age of 23 years.





Figure 3

Type of neoprene rubber support used to guide and stabilize the patella in its glide through the femoral sulcus. A. Sleeve. B. Inner side of sleeve showing buildup around the patella.

The symptoms produced by subluxation of the patella are often subtle and difficult to differentiate from other internal derangements. Complaints of catching, popping or locking or the knee "giving out" are frequently related to athletic endeavors with running. The catching is produced by the abnormal slipping of the patella into the patellofemoral groove, usually occurring at the moment during walking or running when the weight bearing leg begins to extend from the flexed position, that is, between mid-stance and take-off. Vigorous quadriceps contraction enhances the tendency toward subluxation and such movements as cutting away from the weight bearing foot also enhance the mechanism of lateral displacement. In this action, external rotation of the tibia on the femur, as the patient cuts in the opposite direction, along with a valgus stress to the knee and the contracting quadriceps mechanism, increase the tendency for the patella to displace from its normal groove. Congenital deficiencies, such as a low profile of the lateral femoral condyle or dysplasia of the configuration of the patella, predispose to the patellar instability.

Deficiencies of the extensor mechanism can be divided into (1) abnormalities of the patellofemoral condifuration, (2) deficiencies of the supporting muscle or guiding mechanism and (3) malalignment of the extremity relating to knee mechanics. Often there are deficiencies in more than one category which contributes to the instability.

Physical examination may expose some of the predisposing deficiencies which include a more laterally inserted patellar tendon than normal, an excessive external tibial torsion, internal femoral rotation which functionally acts as a more laterally inserted patellar tendon, femoral neck anteversion with internal rotation of the femoral condyles, weakness of the anterior medial retinaculum, dystrophy or weakness of the vastus medialis obliquus muscle, genu recurvatum producing a general laxity of the extensor mechanism and loss of buttressing action of the lateral condyles, and abnormally high riding patella (patella alta), hypermobility of the patella due to poor muscle tone, genu valgum - either congenital or acquired, and insufficient height of the lateral femoral condyle with resultant shallow patellofemoral groove. The examination should include checking the patella for instability with the knee in full extension and also with the knee flexed 30 degrees. If the patella can be displaced more than half of its diameter out of the groove when the knee is relaxed and in 30 degrees of flexion, then laxity can be suspected. (Fig. 4) Occasionally, in testing this maneuver, the patient may



Figure 4

Laxity of the patella can be demonstrated by testing with the knee flexed 30 degrees and with the quadriceps muscle relaxed. If the patella can be passively displaced more than half its width, laxity can be suspected. exhibit discomfort and apprehension that the patella is going to be forced out of the groove. This is the Fairbanks, sign or commonly known as the grab sign or anxiety sign, since the patient will often grab for the examiner's hand to prevent him from continuing the test. Other findings, on examination, include tenderness over the medial or lateral facet, underdevelopment of the vastus medialis obliquus muscle, laxity of the medial retinaculum, a recurvatum with a prominent fat pad, or divergence of the patella when viewed from the front with the patient's knees flexed to 90 degrees. The "Q angle" is the angle formed by a line from the anterior superior iliac spine to the center of the patella and line from the tibial tuberosity to the center of the patella. This angle is increased in valgus deformity or where there is lateral displacement of the tibial tubercle. The "Q angle" may be increased above its normal 15 degrees in subluxation and dislocation of the patella. It is not a pathonomic sign but merely indicates an increased propensity for patellar instability should it be found.

Roentgenographic evaluation of the patella and the patellofemoral groove is necessary to determine the configuration of the patella in the groove. Several roentgenographic views are helpful in assessing the extensor mechanism. A standing view with the foot pointed straight ahead and the roentgen tube centered over the knee joint helps in evaluating the alignment of the extremity for such conditions as genu valgum or varum or femoral torsion. The position of the patella in relation to the patellofemoral groove can also be determined. The patella itself is assessed for any evidence of bipartite patella osteochondral fractures or calcifications around the edges.

A lateral view is taken to assess the relationship of the patella to the sulcus. Blumensaat's line has been described as a reference point. This is a line projected through and parallel to the dome of the intercondylar fossa identified on the lateral roentgenogram by increased density of bone at the roof of the fossa. Normally the distal edge of the patella should meet this line with the knee in 30 degrees of flexion. If it lies significantly above this line, a patella alta may be suspected. Considerable variation, however, is present in the angle of the axis of the femur and Blumensaat's line and this variation can result in errors in the assessment of patella alta. Insall described a method of relating the diagonal length of the patella to the length of the patellar tendon expressing it as a ratio of patellar length over patellar tendon length which normally should be 1.0. A more than 20% variation with a greater patellar tendon length than patellar length is associated with patella alta. Variations in size and ossification of the patella and tibial tubercle due to skeletal immaturity may make the method less accurate.

Tangential views of the patella are particularly helpful in assessing the configuration of the patella and its groove. (Fig. 5) The patella may be classified according to its shape by the classification of Wiberg and Baumgartl. In this classification there is progressive decrease in the size of the medial facet with a gradual lessening of the concavity until it becomes convex. Of the six types described, the Jagerhut (Hunter's cap) is the most extreme with no medial facet. The height of the femoral sulcus may also be determined by the tangential views. The sulcus angle is measured by the angle created by lines from the deepest portion of the groove to each of the femoral condyles. Tilting of the patella may also be ascertained by determining if there is a greater space between the medial facet and medial condyle in reference to the lateral joint space.

Treatment for patellar instability should initially be non-operative, particularly in the adolescent. Isometric exercises with the knee in extension are done to improve quadriceps strength without irritating the articular surfaces. In cases of acute subluxation, with evidences of joint reaction, a cylinder case may be used. After the acute phase, a program of exercises done in an isometric manner should be instituted and these carried on as a maintenance program to provide as much muscular support to the patela as possible. The use of a rubberized knee support to stabilize and guide the patella as it moves through the sulcus is also beneficial.

If there is continued subluxation in spite of the conservative measures, one should then consider a surgical approach to the problem to realign the patellar with the anatomic axis of the femur and to balance the dynamic stabilization of the extensor mechanism. If the imbalance is only a minor one or in the adolescent where more extensive procedures are not indicated, a lateral retinacular lengthening may help to centralize the patella in the groove.

When considering more extensive surgery, one must be cognizant of some of the post-operative problems that may occur. It must be remembered that in realignment of the extensor mechanism during the surgical procedure one is attempting to produce a dynamic balance during a static situation. Problems that have occurred following surgery on the extensor mechanism include recurrence of subluxation or dislocation, medial instability with the patella subluxating medially, patellar tendon detachment seen after such procedures as the Goldthwaite procedure, limitation of knee flexion due to a tight extensor mechanism, recurvatum produced by growth disturbances relating to the proximal tibial epiphysis, patella infera, (low lying patella) due to too far distal advancement of the patellar tendon, increased tibial external rotation due to moving the tibial tubercle too far medially and providing muscle pull to the proximal tibia into external rotation, retropatellar pain due to tightness of the patella as it moves through the groove, and degenerative changes from the incongruencies of the patellar action.

If there is marked patellar configuration dysplasia, such as a Type IV or Jagerhut type patella, or a markedly shallow sulcus, the problems of balancing the patella on the anterior femur become most difficult. In the adolescents where bony procedures are not indicated because of the remaining growth of the epiphysis one has to use a soft tissue procedure. One such procedure is a medial transfer of the medial half of the patellar tendon through a subperiosteal slit in the proximal tibia. This is done to change the vector of force of the patella as it



Roentgenographic tangenital view showing a dysplastic patella with a shallow sulcus angle. The patella is sitting in a slightly subluxated position in relation to the central area of the sulcus. Normal sulcus angle on this view is 114° (plus or minus 60). 0

moves through the sulcus into alignment with the anatomic axis of the femur. When this is done, the knee is flexed to 130 degrees and the tension between the lateral and the transplanted medial patellar tendon is equalized to produce the proper tension on the medial half. In the more mature individual, the Elmslie-Trillat tibial tubercle transplant is used. This consists of release of the lateral retinacular structures, elevating the tibial tubercle leaving a small sliver and periosteum attached distally and shifting the patellar tendon medially. The alignment of the patella and patellar tendon with the groove is then evaluated and the knee flexed to make certain that the patella is brought into a centralized position in the groove. The tibial tubercle then fixed to its new bed with a screw or staple. Other procedures, including vastus medialis advancement for enhancement of the vastus medialis obliquus on the patella can sometimes be used. Care, however, should be taken to avoid tightening this too greatly or pulling it too far distally on the patella since to do so may produce increased patellar compression or a spinning of the patella in the groove.

Post-operatively, the knee is immobilized in a cylinder cast for approximately six weeks. The patient may bear weight as tolerated. The patient is instructed to do isometric exercise while in the cast. After the cast is removed, motion of the knee is instituted and a continued program of muscle exercises of both the quadriceps and hamstrings should be continued.

The exercise program should primarily be isometric exercises to avoid any irritation of the patella in the patellar femoral groove.

Chondromalacia of the Patella



Chondromalacia of the patella has several etiologies. Direct trauma, malalignment, recurrent subluxation, and internal derangement of the knee are some of the conditions felt to be a cause for chondromalacia. Some also feel that lack of normal pressure on articular cartilage results in deterioration of the cartilaginous surface with resultant chondromalacia.

Symptoms include a vague discomfort around the front of the knee, again in such activities that require flexion of



Figure 6

Surgical specimen showing the articular surface of the patella. Note the smooth facet on the right of the patella (lateral facet) and the roughened cartilage of the other facet (medial).

the knee such as climbing stairs, sitting for prolonged periods, kneeling, and running. Again the symptoms may mimic those of internal derangement. Physical examination reveals tenderness of the patellar facets with discomfort on compression of the patella into the groove. Crepitation or grating may be noted with flexion and extension. The abnormalities of the guiding mechanism, as mentioned previously, may also be noted on physical examination and be contributing to the onset of the chondromalacia. The first approach to the treatment for chondromalacia as in most extensor mechanism problems should be a conservative one. This consists of an isometric exercise program, a patellar stabilization support and avoidance of the activities which aggravate the discomfort. The use of salicylates has been advocated as a means of stimulating the cartilaginous regrowth. However, the efficiency of the salicylates as an aid to articular cartilage regeneration has not been proven. If there is evidence of foot pronation, the use of orthotics to balance foot strike sometimes will give relief of the symptoms. In some series as high as 70 to 85% of patients with chonfromalacic symptoms have been improved by the use of conservative methods.

Surgical procedures are indicated when a definite malalignment or abnormality is noted which does not respond to conservative treatment. A lateral retinacular lengthening may relieve the symptoms. At this time the articular surfaces of the patella and femoral sulcus are inspected. (Fig. 6) If a small area of degeneration is found, this area can be trephined and drilled to allow regeneration of fibrocatilage. If, however, the entire patella is involved, the removal of the entire articular cartilage is less successful. Some have stated that shaving of the degenerated cartilage of the patella along with realignment of the extensor mechanism will give satisfactory results. If the chondromalacia is confined to one or both borders of the patella, a partial facectomy may be helpful in removing the irritating focus. It is important to remember that if anything is done to the patella itself the underlying cause of the chondromalacia needs to be corrected. Such measures as patellar tendon transplant and medial retinacular reefing are some of the procedures used. Recently, a procedure known as the Maquet procedure has been used. This is taking a block of bone from the iliac crest, of approximately one centimeter in width and placing it beneath the tibial tubercle, thus elevating the tibial tubercle to decrease the pressure on the articular surfaces of the patella and sulcus.

Summary

In treating problems of the extensor mechanism, a careful evaluation of the underlying causes, such as instability, malalignment or local irritation must be determined. Conservative treatment is first instituted in nearly all cases and will often provide adequate resolution of symptoms. In those cases of patellar instability, particularly in the adolescent, conservatism is important since many will improve without surgery with the proper conservative management. It must be remembered that the movement of the patella in the sulcus with flexion and extension of the knee is a dynamic process. During a surgical procedure the patient's muscles and the joint itself are in a static situation and the problems of balancing the extensor mechanism become sometimes quite difficult.

A proper program of rehabilitation after surgical treatment of the patella is important. The patella should not be irritated by repetitive isotonic exercise programs but should be treated primarily with an isometric exercise program so that both the quadriceps and hamstring muscles are developed to their fullest to provide the muscle strength around the knee to help minimize further symptoms. Use Divajex hot and cold therapy products to give your athletes complete professional treatment. Speed-up recovery time, get them safely back in the lineup and lessen the severity of the injuries. Application is easy and your players stay mobile without water mess. Divajex is your No. 1 source of hot or cold therapy. We sell Blue-Ice® flexible Refreezable Gel Packs and patented Elastic-compression Wraps with Gel Packs, Portable Cold Therapy Kits, Refrigerated Pitcher's Arm Wraps, Cryopedic® Supports and complete Freezer Systems plus Hydro-Therm reusable moist heat packs. See your dealer or call toll free (800) 854-0175. In California (714) 832-8970.

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HOW TO HEAL THE WHOLE ATHLETE



potpourri

By Dennis Aten, ATC Eastern Illinois University

Career Education

The U.S. Senate has recently passed the Career Implementation Incentive Act S 1328 which authorizes up to \$325 million, over a five year period, of Federal funds to assist States and local educational agencies make career education a major goal of the educational system. Practical methods of relating classroom activities to on-the-job realities and to emphasize the relationship of all educational experiences to every day living will be sought.

This Bill may include funds to help establish new and developing careers such as athletic training. It may be pertinent for all of us to evaluate our situation as it may relate to career education in high school and colleges.

Old Drugs in Medicine Cabinets?

Personal prescription drugs are used by other members of the family in 41% of the households surveyed by Univ. of Minnesota researchers. The researchers say they found an average of 12 drugs in each household, which were kept in the medicine cabinet an average of 19.7 months.

Ultrasound Radiations Safety Performance Standards Ultrasonic Therapy Products

The following item quotes directly a DHEW news release on ultrasound dated February 17, 1978.

"The Food and Drug Administration today issued a mandatory safety performance standard to protect people from improper exposure to radiation emitted by ultrasonic equipment used in physical therapy.

Ultrasound, a form of energy similar to but higher in frequency than ordinary sound waves, can penetrate body tissues. It is widely used by physicians and physical therapists to produce 'deep heating' effects for relief of pain and to promote healing in muscle and joints.

The regulation is the first Federal mandatory safety performance standard for equipment that produces ultrasonic radiation. About 3,715 million ultrasound treatments are administered each year in the United States. About 15,000 ultrasonic therapy units are in use in hospitals, and about 35,000 additional units are located in other facilities such as physicians' offices and nursing homes. There are nine manufacturers of ultrasonic equipment producing a market in excess of \$8.5 million annually.

The new standard is being issued because of FDA surveys which showed wide discrepancies between claims made for ultrasonic equipment and actual performances. The Agency found, for example, that many units delivered too little energy which can cause burns, swelling, and damage to nerve and other sensitive tissues. The standard will assure accurate delivery of ultrasound waves as claimes for the product and indicated by the equipment's controls.

The standard also requires instructions and precautions to assure safe and effective use of equipment.

In addition, the new standard requires manufacturers to provide service and repair information to dealers and distributors, maintenance schedules, operating and instruction manuals, and assembly and installation directions.



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The regulations does not apply to ultrasonic equipment used in surgery and dentistry or for removal of eye cataracts, or to diagnostic ultrasonic equipment. FDA is investigating the need for separate radiation safety regulation for diagnostic equipment using ultrasound.

This final standard is published in the February 17, 1978 Federal Register; it applies to equipment manufactured after February 19, 1979.

Sports Medicine Society Installs J.C. Kennedy, MD

Jack C. Kennedy, MD, of London, Ontario, Canada, assumed the presidency when some 598 persons attended the annual meeting of the American Orthopaedic Society for Sports Medicine June 30-July 4 in Lake Placid, New York.

Dr. Kennedy succeeded Marcus J. Stewart, MD, of Memphis, Tennessee. Other officers seated at the meeting were MDs James A. Nichols, New York City, presidentelect; Robert L. Larson, Eugene, Oregon, vice president; Harry H. Kretzler, Jr., Seattle, Washington, treasurer; and H. Royer Collins, Inglewood, California, secretary.

Several other highlights featured the meeting. One was the presentation made to Thomas B. Quigley, MD, of Boston, as "Mr. Sports Medicine for 1978."

Sport Medicine Center Open

After more than two years of planning and preparation. one of the most complete sport medicine and research centers in the United States is now in full operation in Mobile. The Center, part of the United States Sports Academy's activity on the University of South Alabama campus, opened its Cardiac Therapy Program on August 7 as one of the three major programs the Center offers. The two other programs, which have been in full operation for several months, are the Fitness Profile Evaluation and Orthopedic Treatment and Rehabilitation.

Located in the Physical Education (HPELS) building on the University of South Alabama campus, the Sport Medicine and Research Center is considered one of the best designed and best equipped in the country and professionals in the field who have visited the Center have termed it a "model" facility of its kind.

The Center is unique in that it offers the three varied programs in one facility.

While the Center's programs serve many people in the local Mobile community and the surrounding Gulf Coast area, all the programs are available to everyone regardless of where they live.

NEISS Reports On Equipment Safety

The National Electronic Injury Surveillance System records injuries relating to product safety as treated in sample emergency rooms in the United States. Interesting, but not surprising, is the data involving sports and recreation equipment from July 1, 1977 to June 30, 1978. Bicycles were involved in the most number of estimated total cases (435,981) with football and baseball equipment ending up second and third (398,617 and 392,516 respectively). Basketball (344,871) is fourth, playground equipment (135,156) is fifth, skateboards (114,937) are sixth, and snow skiing (107,048) is seventh with equipment from several other activities following behind.

When considering the age group, 15-24, as incidents per 100,000 population, football ranked first (530.2). Basketball was second (503.1) and baseball was third (371.9) with all others following far behind. This indicates where the majority of product related accidents occur in our school aged athletes.

1976-77 N.A.I.A. Wrestling Tournament Injury Survey

by KERRY FREY Eastern Washington State College

There are few documented studies concerning the nature and incidence of wrestling injuries in the literature. Coaches and trainers involved in the sport however, can identify with a repertoire of injuries which are characteristic of the specific stresses created in wrestling competition.

The purpose of this study was to collect information pertinent to the nature of wrestling injuries, as they occurred during the 1976-77 season, and as they occurred during the National Association of Intercollegiate Athletics (NAIA) national wrestling tournament held March 3, 4, and 5, 1977, at Eastern Washington University in Cheney, Washington. The data were gathered from 385 wrestlers representing 89 NAIA schools competing in the tournament. Information was obtained from a questionnaire administered to the athletes by visiting athletic trainers and members of the athletic training staff at Eastern Washington University. Identical questions were asked of all wrestlers during the weigh-in activities which were held one day prior to the tournament. In this survey an injury was defined as a trauma or illness which occurred in, or was the result of a wrestling practice activity or match participation, and which resulted in the athlete's absence from one match or at least two practice sessions.

Information gathered from the questionnaire (Table 1) included the following:

1 incidence of injury during 1976-77 season

2) body part and type of injury regarding above injuries

3) present physical status of participants

4) knowledge of school's athletic training personnel

Injuries that occurred during the tournament were also recorded and included weight class of athlete, type of injury, and injury site.

QUESTIONNAIRE RESULTS

The most frequent types of injuries experienced during the 1976-77 season by wrestlers participating in the NAIA meet were sprains (61%) and strains (25%). The most

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frequently injured body parts were knees (46%), ankles (12%) and shoulders (12%). Ten percent of the wrestlers considered themselves to be wrestling with an injury at the time of the weigh-in procedures. (Table 2)



EWU's Jerry Lorton removed from action with potentially serious cervical injury while "the beat goes on".



Mike Reed, EWU two-time NAIA champion at 158 pounds, up-ends opponent.

Table 1

1977 NAIA WRESTLING INJURY SURVEY FORM

WEIG	HT CLASS	EXAMINER			DATE	
ATHL	ETE COUNT					
T	Unun yay baan ini	uned this uses			Vee	
1.	(missed two or mo	pre practice		-	res	
	sessions due to i	njury)		-	No	
п.	Are you injured n	iow? (Do you		_	Yes	
	with an injury at	this time)		-	No	
				_	Do n	ot wish to
III.	Injury Type				Comm	ent
	a. joint sprain	d	1. laceration _	-		
	b. m/t strain	e	. fracture _		_	
	c. contusion					
IV.	Body Part Injured	1				
	Head	Face	Neck ·			
	Upper Arm:	Elbow:	Forearm		Writ	st:
	Hand/Finger/Thum):	Back:		Chest:	
	Abdomen:	Hips:	Groin		Quade	
	Hamstrings:	Knee:	Calf:		Ankle	
	Foot:	Other:	00111			
		ouner +				
٧.	Does your school	have a trainer?		Yes	No	
	Is he certified h	by the NATA?	in take	Yes	No	Don!t
	1977 NATA Wr	estling Tourname	Table 2	04 040	ctionnaim	Desults
		(385	participants)	-y que	scronnarre	Results
I.	Have you been ini	ured this year?		VEC	120	122 581
	(missed two or mo	re practice		TES	- 129	(33.5%)
		n ngury)		NDENTS	- 200	(00.5%)
П.	Injury Type		TOTAL NEOFU	IJENTS		
	(during 1976-77 s	eason)				
	Joint Sprain Musculotendonous	Strain			- 82	(60.7%)
	Contusion Fracture				- 9	(6.7%)
	Laceration				- 4	(2.9%)
			TOTAL INJUR	IES	- 135	
III.	Body Part Injured (refers to present injury sustained	t injury or previ in 1976-77 seasor	ious 1)			
	Knee	- 92 (46.2%)	Back		- 4	(2.0%)
	Shoulder	- 24 (12.0%) - 23 (11.7%)	Neck Head		- 3	(1.5%)
	Chest Hand/Finger/Thumb	- 17 (8.5%) - 11 (5.5%)	Wrist Calf		- 1	(.5%)
		7 / 0 54	-			(5%)
	Elbow Face	$\frac{-7}{-6}$ (3.5%)	Abdomer Hamstr	n ings		.5%
	Elbow Face Foot	$-\frac{7}{6}$ (3.5%) $-\frac{6}{5}$ (2.5%)	Abdomer Hamstr Other	n ings	- 1 - 1 - 1	(.5%)
	Elbow Face Foot	$\frac{-7}{-6}$ (3.5%) $\frac{-6}{-5}$ (2.5%)	Abdomer Hamstr Other TOTALS	n ings	- 1 - 1 - 1 199	(.5%) (.5%)
IV.	Elbow Face Foot Are you injured no (Do you consider y	- / (3.5%) - 6 (3.0%) - 5 (2.5%) w? yourself wrestlin	Abdomer Hamstri Other TOTALS	n ings YES	- 1 - 1 - 1 - 1 - 1 1 	(9.9%)
IV.	Elbow Face Foot Are you injured no (Do you consider) with an injury at	- / (3.5%) - 6 (3.0%) - 5 (2.5%) pow? yourself wrestlin this time?)	Abdomer Hamstr Other TOTALS	n ings YES NO	- 1 - 1 	(9.9%) (89.1%)
IV.	Elbow Face Foot Are you injured no (Do you consider y with an injury at	- / (3.5%) - 6 (3.0%) - 5 (2.5%) pow? pourself wrestlin this time?) Did	Abdomer Hamstr Other TOTALS	n ings YES NO	- 1 - 1 - 1 - 33 - 296 - 3	(9.9%) (89.1%) (1.0%)
IV.	Elbow Face Foot Are you injured no (Do you consider) with an injury at	- / (3.5%) - 6 (3.0%) - 5 (2.5%) ww? pourself wrestlin this time?) Did	Abdomer Hamstri Other TOTALS	YES NO COMMENTS	- 1 - 1 - 1 - 33 - 296 - 33 - 332 - 332	(9.9%) (89.1%) (1.0%)
IV. V.	Elbow Face Foot Are you injured no (Do you consider) with an injury at Does your school H	- / (3.5%) - 6 (3.0%) - 5 (2.5%) w? yourself wrestlin this time?) Did nave a trainer?	Abdomer Hamstr Other TOTALS	YES NO comment IDENTS YES	- 1 - 1 - 1 - 1 - 296 - 296 - 332 - 332 - 276 - 276	(9.9%) (89.1%) (1.0%) (81.9%)
IV. V.	Elbow Face Foot Are you injured no (Do you consider) with an injury at Does your school h	- / (3.5%) - 6 (3.0%) - 5 (2.5%) we have a trainer?	Abdomer Hamstr Other TOTALS	YES NO comment IDENTS YES NO	- 1 - 1 - 1 - 33 - 296 - 33 - 332 - 332 - 276 - 61	(9.9%) (89.1%) (10%) (81.9%) (18.1%)
IV. V.	Elbow Face Foot Are you injured no (Do you consider) with an injury at Does your school h	- / (3.5%) - 6 (3.0%) - 5 (2.5%) pourself wrestlin this time?) Did have a trainer?	Abdomer Hamstr Other TOTALS	YES NO COMMENTS YES NO IDENTS	- 1 - 1 - 1 - 33 - 296 - 33 - 332 - 332 - 276 - 61 - 337	(9.9%) (89.1%) (1.0%) (81.9%) (18.1%) (15.7%)
ιν. ν.	Elbow Face Foot Are you injured no (Do you consider) with an injury at Does your school h A) Is your traine	- / (3.5%) - 6 (3.0%) - 5 (2.5%) we ave a trainer? Did	Abdomer Hamstri Other TOTALS I not wish to o TOTAL RESPON TOTAL RESPON he NATA?	YES NO comment IDENTS YES NO IDENTS YES	- 1 - 1 - 199 - 33 - 296 - 33 - 332 - 276 - 61 - 337 - 189 - 72	(9.9%) (89.1%) (1.0%) (81.9%) (18.1%) (58.7%) (22.4%)
ιv. v.	Elbow Face Foot Are you injured no (Do you consider) with an injury at Does your school H A) Is your traine	- / (3.5%) - 6 (3.0%) - 5 (2.5%) w? yourself wrestlin this time?) Did nave a trainer?	Abdomer Hamstri Other TOTALS In ot wish to o TOTAL RESPON TOTAL RESPON he NATA?	n ings VES NO comment IDENTS YES NO IDENTS YES NO	- 1 - 1 - 199 - 33 - 296 - 332 - 276 - 61 - 337 - 189 - 72 - 61	(9.9%) (89.1%) (1.0%) (81.9%) (18.1%) (58.7%) (22.4%) (18.9%)
IV. V.	Elbow Face Foot Are you injured no (Do you consider y with an injury at Does your school h A) Is your traine	- / (3.5%) - 6 (3.0%) - 5 (2.5%) wourself wrestlin this time?) Did nave a trainer?	Abdomer Hamstr Other TOTALS In ot wish to o TOTAL RESPON TOTAL RESPON he NATA? DON'T KNOW	YES NO COMMENT IDENTS YES NO IDENTS YES NO	- 1 - 1 - 1 - 199 - 33 - 296 - 332 - 276 - 61 - 61 - 72 - 61 - 322	(9.9%) (89.1%) (1.0%) (81.9%) (18.1%) (58.7%) (22.4%) (18.9%)

The 167 pound class exhibited the highest percentage of injuries per total number of participants in a specific weight class (52%) while the lowest incidence was recorded by the 190 pounders (21%). Wrestlers in the 134, 142, 150, 158, 167 and 177 pound weight classes experienced approximately 84% of all the injuries. Sprains accounted for 75% of the 16 injuries experienced by 177 pound wrestlers while 41% of the 24 injuries sustained by 167 pounders were musculotentonous strains. All eight (100%) of the injuries to 126 pounders were joint strains. (Table 3)

Table 3

Weight Class	118	126	134	142	150	158	167	177	190	H-wt.	TOTAL
Number of Par- ticipants	31	31	40	46	36	40	43	42	29	35	385
1. Have you been injured this year?											-
YES -	14(46%)	8(26%)	15(38%)	18(39%)	2(33%)	10(25%)	22(52%)	13(31%)	6(21%)	11(31%)	129
NO -	17(63%)	23(74%)	25(62%)	28(61%)	24(67%)	30(75%)	21(48%)	29(69%)	23(79%)	24(69%)	256
2. Are you injured now?											
YES -	1(3%)	4(13%)	3(7%)	.8(17%)	2(6%)	6(15%)	4(9%)	4(9%)	4(14%)	1(3%)	33
NO -	30(97%)	27(87%)	37(93%)	28(83%)	28(94%)	34(85%)	39(91%)	38(91%)	25(86%)	82(97%)	296
% of Total Injury #	(9.5%)	(5.8%)	(11%)	(11%)	(8.7%)	(8.7%)	(17.5%)	(11.7%)	(8%)	(8%)	100%
3. Injury Type	13	8	15	15	12	12	24	16	11	11	137
Joint sprain	9(70%)	8(100%)	8(53%)	10(67%)	8(67%)	10(84%)	7(29%)	12(75%)	2(18%)	8(73%)	84
M-T strain	2(15%)		4(27%)	4(27%)	1(8%)		10(41%)	2(13%)	8(73%)	3(27%)	34
Contusion			2(13%)	1(6%)		1(8%)	5(22%)		1(9%)		10
Fracture			1 (7%)		3(25%)	1(8%)	1(4%)	1(6%)			7
Laceration	2(15%)						1(4%)	1(6%)			4
% of Total Injury #	(9.6%)	(5.5%)	(10.3%)	(12.3%)	(12.3%)	(8.9%	(12.3%	(12.3%)	(8.2%)	(8.2%)	100%
4. Body Part Injured	14	8	15	18	18	13	18	18	12	12	146
Knee	1(7%)	4(50%)	4(30%)	5(27%)	8(44%)	8(62%)	6(33%)	7(39%)	2(17%)	5(41%)	50
Ankle	6(44%)	1	2(14%)	2(11%)	2(11%)		4(22%)	2(11%)	1(8%)	1(8%)	20
Shoulder	1(7%)		2(14%)	4(22%)	4(22%)	1(8%)	2(11%)	3(18%)	4(34%)	2(17%)	23
Chest			2(14%)			1(8%)	1	1(5%)	2(17%)	2(17%)	8
Hand Finger Thumb		1(13%)	1(7%)	1(6%)	3(17%)	2(15%)	3(17%)	1(5%)			12
Elbow	2(14%)		1(7%)	1(6%)		1(8%)	1(6%)	1(5%)			7
Face	2(14%)		1	1(5%)			1(6%)	2(11%)			6
Foot	21 703	3(37%)	11 700	1				1(5%)	1(8%)		5
Neck	1(/%)		1(7%) 1(7%)	1			1(6%)		2(17%)	2(17%)	5
Head	1(7%)			1(6%)					-(2
Calf				1(6%)	1(6%)			-			
Abdomen Hamstrings Other			1(7%)	1(6%) 1(6%)		-					1

Injury Incidence During NAIA Tournament

Twenty three (5.9%) of the athletes competing presented themselves to the athletic training personnel for injury examination during the tournament. Athletes representing all weight classes received injuries. The 134 and 158 pound weight classes reported the greatest number of injuries per participants in a weight class, 1 injury per 10 participants, while the 146 pounder experienced the fewest number of injuries per class, 1 injury per 46 participants. (Table 4)

Ligamentous sprains were the most frequent injuries comprising 48% of the total. The knee and elbow are the most common sites of injury, representing 35% of the total. The "head" region, including injuries to the face (2), eye (1), ear (1), and scalp (1), also contributed to 21% of the total injuries.

Information Regarding Athletic Trainers

Of the 89 schools participating in the tournament, 56 (64%) are listed in the 1976-77 National Directory of College Athletics as having a trainer. (One school was not listed in this directory.) However, 13 (23%) of the trainers are also head or assistant coaches in their respective athletic programs. Therefore, 43 (44.8%) of the 89 participating schools employ a full-time trainer. Of the 56 schools that indicated they have a trainer, only 27 (48%) employ individuals who are current members of the National Athletic Trainers Association. (3)

Table 4

Incidence of injury by weight class - 1977 NAIA Wrestling Tournament

	118	126	134	142	150	158	167	177	190	h-wt.	TOTAL
Total class participants	31	31	40	46	36	40	43	43	29	35	23
1. Injury Type											
Laceration - (8.69%)	1						1				2
Contusion - (8.69%)	1	1									2
Lig. Sprain - (47.8%)		1	1		2	2		2	2	1	11
M-T Strain - (4.34%)			1								1
Fracture - (4.34%)			1								1
Skin Infection (8.69%)	-			1		1					2
Bronchitis - (17.4%)			1			1	1	1			4
2, Body Part Scalp (4.3%)	- 1										1
Face (8.69%)	-					1	1				2
Eye (4.3%)	- 1										1
Ear (4.3%)	-	1									1
Neck (8.69%)	-	1	1								2
Upper Arm (4.3	%) -		1								1
Shoulder (4.3%) -				1						1
Knee (21.73%)	-			1	1	1		1	1		5
E1bow (13%)	-					1		1	1		3
Hand/Fingers/ Thumb (4.3%)	-		1								1
Rib Cage (4.3%) -									1	1
Other (Bron- chitis) (17.39	x) -		1			1	1	1			4

DISCUSSION

Of the 385 wrestlers participating in the meet, 125 (35/100) sustained an injury during the 1976-77 season. This figure is significantly less than that reported in the 1975-76 Sports Related Incidence Chart compiled by the National Athletic Illness/Injury Reporting System (NAIRS) (2). In this survey it was reported that a total of 66 different wrestlers experienced a reportable injury/illness per 100 wrestlers. A total of 300 participants representing 12 college and university wrestling programs were involved in the NAIRS study.

Approximately 6% of the 1977 NAIA participants sustained a injury during the meet. This figure is less than one half of the number of wrestlers who were reported injured by Reid (5) whose 1970 study recorded the incidence of injury during the 7 day World Wrestling Championship held in Alberta, Canada involving 400 athletes who competed in Greco Roman and Free Style competition. Comparison of the two meets shows a greater occurrence of shoulder and upper arm injuries at the 1970 tournament than at the 1977 NAIA meet. (Table 5) The difference in the sites of injuries of the two meets is most likely due to the difference in wrestling styles used in the two tournaments.

Table 5

Comparison of 1970 World Amateur Meet and 1977 NAIA Tournament

World Amateur Wrestling Meet (1970) NAIA National Tournament (1977)

Number of competitors: Wrestling style: Duration:	- 400 - Greco Roman, Free Style - 7 days	385 American Federation Rules 3 days
Head injuries Neck Upper arm Shoulder Knee Elbow Hand/fingers Rib/thorax Other (Bronchitis)	- 22% - 15% - 12% - 11% - 10% - less than 5% - less than 5% - 0%	22% 9% 4% 22% 13% 4% 4%

Participants in the 167 pound class, the weight-class reporting the highest incidence of injuries during the 1976-77 season, 52%, experienced a relatively low injury incidence during the tournament. Only one injury, a facial laceration and one case of bronchitis, were reported by this weight class. There were four cases of bronchitis total, representing 17% of the total, reported. There were surprisingly few shoulder (4%) and ankle (0%) injuries reported during the meet.

An analysis of the questionnaires received from the weigh-ins indicated some inconsistency. Specifically, the total number of athletes responding to injury questions is different than the total respondents to the athletic trainer questions. Also, the total number of injuries is 135 while the total number of body parts injured is 199. These errors were due to faulty recording of questionnaire information at the weigh-in procedures. However, data from each question was tabulated and analyzed independently. Consequently, it is felt that the information derived from the questionnaire is valid and that the survey is accurate.

CONCLUSION AND RECOMMENDATIONS

Sports medical studies classify wrestling as one of the least safe athletic activities. (1, 2) The 1976-77 NAIRS study examined the incidence of injury in 18 sports and found that wrestling recorded the highest number of athletes (66) experiencing a reportable injury/illness per 100 athletes (2). The 1977 NAIA study has documented that over one third of the 385 wrestlers competing in the three day tournament sustained an injury during the 1976-77 season.

The potential for injury in wrestling competition will undoubtedly remain high due to the nature of the sport. Successful wrestlers, those who perform at high levels of skill without injury, usually exhibit maximum levels of fitness in all components. "Superb physical conditioning is absolutely essential for success in wrestling." (4) It is suggested that conditioning exercise programs which increase flexibility, strength and power, and endurance (cardio-vascular and strength), and which are maintained prior to and during the season, be employed to decrease the incidence of injuries in addition to increasing the level of performance and skill.

Premature return of injured athletes to participation also increases the possibility of wrestling injuries. An athlete whose injury is only partially rehabilitated but who is allowed to compete, will more than likely suffer a more severe recurrence of that injury or a compensatory injury at a later time. Rehabilitation programs, supervised by qualified trainers, therapists, or physicians, should be implemented after the injury has been allowed proper time to heal; these programs should be progressive in nature and designed to meet the specific needs of the athlete.

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The Ruptured Spleen: Implications for the Athletic Trainer

by DALE B. HAHN, Ph.D. The Ohio State University



Athletes may understand less about the spleen than other organs of the body. Among athletes in the training room, a discussion regarding the spleen might elicit comments such as:

"Humans don't have spleens. . .only animals have spleens."

- "A spleen is like a gizard, isn't it?"
- "It is as useless as an appendix."
- "Only women have spleens."
- "The spleen is one part of the liver."

Archaic practitioners of witchcraft considered the spleen to be the primary seat of emotions and passions. Although the spleen was believed to be responsible for a wide range of emotions, the emotion reported most often was anger or spite (10). Years ago, a person possessing a large spleen was destined to be a vengeful, hate-filled person. Conversely, an individual whose spleen had been removed was expected to be a jolly, happy fellow.

Despite the origins of philosophical thought concerning the spleen, traumatic injury to this organ can provide athletic trainers with complicated evaluative problems. Although serious abdominal injuries are relatively rare in athletics today, the rupture of the spleen is the greatest single cause of death among all abdominal injuries in sports (7). Consequently, a general understanding of the spleen is vital for all trainers. This paper will attempt to provide the reader with basic information concerning (a) the location and structure of the spleen, (b) the functions of the spleen, (c) the evaluation of a possible injury to the spleen, and (d) the treatment of the ruptured spleen.

Location and Structure

The spleen is a highly vascular organ positioned on the left side of the upper abdominal cavity. Its lateral surface is molded convexly against the dome of the diaphragm. The stomach, pancreas, and the left kidney all border its medial surface. A layer of peritoneum invests the spleen and holds it in place (5).

A simple method for summarizing the particular statistical features of the spleen is to remember the odd numbers 1, 3, 5, 7, 9, and 11. The ovoid shapped spleen measures 1 by 3 by 5 inches. Seven ounces generally is considered the approximate weight of the organ. Finally, the spleen is located between the 9th and 11th ribs. As a general rule, the size and shape of a person's spleen correspond to the size and shape of that individual's clenched fist. Observation reveals that the spleen is a firm organ of a dull red color (8).

The ability of the spleen to vary greatly in size is a primary characteristic of this organ. Expansion and contraction result from the elastic nature of the capsule (outer wall) of the spleen. This outer wall is composed of white fibers, elastic fibers and smooth muscle fibers.

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Projections (trabeculae) of the same elastic composition spread inward from the outer surface of the spleen. These trabeculae divide the organ into compartments that are sponge-like in nature. These chambers contain reticular fibers and reticuloendothelial cells and are filled with blood. Nourished by the splenic artery, the spleen can store about one-sixth of the total volume of blood in the human body (1).

Functions of the Spleen:

1. Blood Destruction

Old red blood cells, having reached their normal life span of approximately 120 days, are destroyed in the spleen by a large mass of reticuloendothelial tissue.

2. Blood Production

The spleen exerts an effect on production and release of blood cells from bone marrow.

3. Immunologic Function

The spleen is a source of production of antibodies and contains a large mass of lymphatic tissue.

4. Blood Storage

The spleen serves as a resevoir for blood. It undergoes rhythmic variations in size in response to physiologic demands such as exercise and hemorrhage, and thus influences the volume of circulating blood.

5. Blood Filtration

The spleen serves as a part of the body's defense mechanism by filtering microorganisms from the blood (4).

The importance of the spleen during fetal life and shortly after birth is well recognized. During this time period, the spleen is active in manufacturing all types of blood cells vital to the young organism. The manufacturing function of the spleen during adult life, however, is restricted to the production of lymphocytes (5). Since adequate supplies of lymphocytes are produced in other areas of the adult body, the necessity of the spleen is not particularly essential. In fact, an individual whose spleen has been surgically removed can usually lead a normal life with no obvious disabilities (4).

Evaluation of Possible Injury to the Spleen

In most contact sports, a participant's body is adequately protected from serious injury by proper equipment. However, equipment designers have failed to devise a piece of equipment which adequately protects an athlete's thoracic-abdominal area and, at the same time, allows uninhibited movement. Thus, with the possible exception of hockey goalies and baseball catchers, the majority of athletes today risk injury to internal organs whenever they engage in their particular sport.

When injury occurs, the organs frequently affected are those classified as solid organs. Klafs and Arnheim (6) categorize the kidneys, liver, adrenal glands, pancreas and the spleen as solid organs. Hollow organs "include vessels, tubes, and receptacles such as the stomach, intestines, gall bladder and urinary bladder". (6). For a hollow organ to sustain injury, it must generally be full of fluid prior to physical contact. Since the spleen is a solid organ filled with blood and tissue, it is susceptible to rupture.

Most often, the ruptured spleen results from a sharp blow to the chest or abdominal region. Gross indications of the injured athlete which may contribute to an accurate Ú

evaluation include signs of shock, abdominal rigidity, nausea, and vomiting (6). Frequently the athlete will complain of chest pains on the left side and in the left scapular region, accompanied by labored breathing. Additional physical findings might be paleness and sweating (7). A drastic drop in blood pressure may result from the internal hemorrhaging.

Butsch and Butsch (2) believe that a further indicator of splenic trauma is tenderness in the lower abdomen. This tenderness seems to be a direct result of the downward flow of blood toward the pelvis. Understandably, the degree of tenderness in the abdomen is dependent upon the amount of blood which has migrated to the area. The configuration of the viscera in the patient's abdomen determines how far the blood will travel. Abdominal pain usually accompanies this tenderness.

Experienced trainers and physicians often refer to a telltale sign of a possible ruptured spleen - Kehr's sign. Kehr's sign is actually a reflex excitation of the phrenic nerve, due to the hemorrhaging spleen. This phrenic nerve stimulation usually extends from the region of the spleen to the left shoulder and about one-third of the way down the left arm (6). Because of this stimulation, the athlete will probably complain of a sharp pain in the left arm. This pain may prevent the athlete from moving the arm through the normal range of motion.

Although the Kehr's sign is reported to be a reliable indicator of the ruptured spleen, Steele and Lim (9) report that this sign is present only in relatively isolated cases. In their five year review of 298 patients undergoing splenectomy at San Francisco General Hospital, Steele and Lim recorded only a few cases in which the Kehr's sign was present. Nevertheless, Clark, Lim and Margaretten (3) report that the Kehr's sign is present in about 75% of the patients with ruptured spleens.

The greatest danger involved with splenic trauma is the possibility of delayed hemorrhage. A spleen has the ability to "splint" itself by the production of a loose hematoma formation (perisplenic hematoma) and the constriction of the surrounding and supporting structures. Once the ruptured spleen has coagulated and sealed itself, it can increase in size because of the elastic nature of its tissue. In this condition, the spleen is highly susceptible to the slightest strain or blow. If such a strain occurs, the splinting effect is disrupted and massive hemorrhaging often results. Unless prompt surgical intervention occurs, the injured person will likely bleed to death. (6).

Accurate recognition of a possible ruptured spleen is imperative. An athlete with a spleen injury may show no obvious indications that he or she is seriously injured. The athlete may ignore an injury in the heat of an athletic contest, but will complain later of a dull, remittent pain in the left side.

The responsibility rests with the trainer or physician to recognize a change in the athlete's physical status. Remembering that a spleen may not hemorrhage until days or even weeks after an athletic contest, a trainer or physician must make repeated examinations to check for a possible ruptured spleen. One medical report describes a patient whose secondary spleen rupture occured five years after the initial trauma. (3)

The repeated examination is the single most important diagnostic technique used to detect a ruptured spleen once the athlete has been referred to the physician. At this time, the physician may use a variety of diagnostic aids, including an X-ray of the abdomen for the size of the splenic shadow, barioum swallow for the displacement of the stomach shadow, and peritoneal taps (7). Recent success with a diagnostic procedure called the peritoneal lavage has caused numerous physicians to conclude that "delayed rupture of the spleen is, in reality, usually a delay in diagnosis of splenic rupture." (9)

Treatment of a Ruptured Spleen

When an injury has been evaluated as a possible ruptured spleen, the athlete should be placed immediately in the care of a physician. Until a physician is available, proper first aid procedures usually include keeping the athlete calm and immobilized. Do not permit the athlete to move under his own power. Monitor all vital signs and be prepared to treat for shock and the absence of breathing. Only a surgeon can actually treat a ruptured spleen, since a ruptured spleen almost always requires surgical removal (6).

Post operative rehabilitation procedures for a splenectomy patient might include a three month period during which the athlete's physical activity consists of nothing more strenuous than walking. This period of inactivity permits the sutured abdominal muscles to heal sufficiently. After three months, the athlete may begin to recondition the abdominal area with moderate amounts of exercise. Recovery is usually rapid at this time. Normally, the athlete can resume athletic endeavors at a pace with which he feels most comfortable. After six to nine months, participation in contact sports is reasonably safe. Complete recovery is typical. Keep in mind that these procedures are only general ones - individual cases may vary considerably with the severity of the abdominal trauma.

One Final Word

This article has attempted to provide the reader with a working knowledge of the spleen. A central focus was the recognition of splenic trauma and the methods an athletic trainer can implement to provide appropriate interim care. Hopefully, trainers will become more aware of the significance of the spleen and its implications to athletic injuries.

Only rarely will an athletic trainer be confronted with an athlete having a ruptured spleen. Nevertheless, an early evaluation is crucial, since a ruptured spleen has the potential to cause death.

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90 ankles	22-30 min.	1½-2¼ hrs.

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announcements

INJURY INFORMATION SOUGHT

Dr. Carl S. Blyth, chairman of the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports, is seeking information regarding either catastrophic injuries or fatalities in the sport of football.

The information gained will aid in compiling the survey of football fatalities and catastrophic injuries, which is conducted annually by the Association, the American Football Coaches Association and the National Federation of State High School Associations.

Blyth requested that any information (such as newspaper clippings) relating to a catastrophic injury or a football fatality be sent to him at the following address: Department of Physical Education; The University of North Carolina; Woolen Gym 047A; Chapel Hill, North Carolina 27514.

A Timely Reminder ...

Your contributions and continuing support to the NATA Scholarship Fund are always welcome and are necessary so that the endowment goal of \$500,000 can become a reality. Please remember that our program of financial assistance is a four-fold one that offers scholarships, loans, grants and part-time employment. Organizational support from the NATA to the Fund continues, but your individual contributions are vital to the Scholarship Fund's ultimate success. All contributions are tax deductible. Won't you consider now the importance of your participation in the NATA Scholarship Fund? Make your checks payable to Scholarship Program, and mail them to this address: William E. Newall, Purdue University Student Hospital, West Lafayette, Indiana 47907.

Brochure Requests

All requests for the brochure entitled "Careers in Athletic Training", previously handled by Mel Blickenstaff, A.T.,C. of Indiana State University, should now go to Charles O. Demers, A.T.,C. Chairman, NATA Career Information Services, Athletic Department, Deerfield Academy, Deerfield, MA 01342.

Certification

Persons wishing to be certified as an Athletic Trainer by the N.A.T.A. must fully qualify under the procedures for Certification prior to taking the Certification Examination.

The examination is given four times yearly. It is administered one day prior to the annual convention in June at the convention site, the third Sunday of January (on a regional basis), the second Sunday of March (on a regional basis), and in early August, (applications are processed at the same time as for the annual convention.)

Persons desiring to take the examination may obtain application materials from N.A.T.A. Board of Certification, Valparaiso University Valparaiso, Indiana 46383, provided the individual meets the membership requirement. The application must be requested in writing four months prior to the date of the examination. No applications will be furnished to the applicants after that date in order to assure that the application deadline of sixty (60) days prior to the examination may be met. All August applications must be processed with the same deadlines as for the June annual convention site.

If further information is required, contact Rod Moore, Chairman NATA Board of Certification, Valparaiso University Valparaiso, Indiana 46383.

JOURNAL DEADLINES

In order to avoid confusion and delays for any contributions you have for the Journal the deadlines for various sections of the Journal are provided below.

Send any materials for any section of the Journal other than formal articles and "Calendar of Events" to:

Rod Compton, ATC Sports Medicine Division East Carolina University Greenville, NC 27834

This includes sections such as "Tips From the Field", "Announcements", "Case Studies", "Letters to the Editor", etc. The deadlines are:

Deadline
July 15
October 15
February 15
March 15

Deadline for "Calendar of Events": Information on upcoming events should be sent to:

Jeff Fair, ATC Athletic Department Oklahoma State University Stillwater, Oklahoma 74074

July 1
October 1
February 1
March 1

Articles must be sent to: Clint Thompson, ATC Jenison Gym Michigan State University East Lansing, Michigan 48824

The Editorial Board will then review each article and work with authors to help prepare the articles for publication. Each article is handled on an individual basis.



CURRENT LITERATURE

Continued from page 172

"Ring Injuries in Sports," Bennett, J. The Physician and Sportsmedicine. 6:76, May, 1978.

"Ruptured Spleen in College Athletes: A Preliminary Report," Frelinger, D. Journal of the American College Health Association. 26:217, February, 1978.

"Soft Contact Lenses for Athletes," Morehouse, C. The Physician and Sportsmedicine, 6:106, May, 1978.

"Sports Medicine: The New Specialty," Fortino, D. Harpers Bazaar, 250 West 55th St., New York, New York 10019. 111:20, May, 1978.

"Sudden Death in Athletes and Marfans Syndrome," McMillan, R. The Physician and Sportsmedicine, 6:104, June, 1978.

"The Deranged Knee: Restoration of Function," Yocum, L., Bachman, D., Noble, H., and Hoover, R. The American Journal of Sports Medicine. 6:51-53, March-April, 1978.

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"The So-Called "isolated" anterior Cruciate Ligament Tear or Anterior Cruciate Ligament Syndrome: A Report of 32 Cases with some Observation on Treatment and Its Effect on Results," Youmans, W. The American Journal of Sports Medicine. 6:26-29, January-February, 1978.

"There's a New Sports Medicine for the New Athlete," Sheehan, G. World Tennis, 383 Madison Ave., New York, New York 10017. 26:113, June, 1978.

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"Treating "Cauliflower Ear" with Silicone Mold," Gross, C. The American Journal of Sports Medicine. 6:4, January-February, 1978.

"Update on Value of Warm-Up," Jensen, C. and Jensen, C. Scholastic Coach, 50 West 44th St., New York, New York 10036. 48:106, September, 1978.

"When the Adrenalin Flows," Thomas, T. Scholastic Coach. 48:106, September, 1978.

"Your Summer Sports: Just How Dangerous?" Michael, R. U.S. News. 85:21-3, July 31, 1978.

ATHLETIC TRAINING • Winter 1978



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Writing Articles for the Journal

by

Kenneth L. Knight, PhD, ATC Athletic Trainer & Associate Professor Indiana State University

Editors Note: With the introduction of the 1st Annual NATA Student Writing Contest in the Fall 1978, issue of *Athletic Training*, we feel it would be helpful to offer students some specific guidelines to help them in writing. This article was edited and revised by Dr. Knight from "Preparation of Articles for Publication" which he wrote for *Athletic Training* in 1976.

It's a paradox that the academic community equates scholarship with publishing articles in scholarly and professional journals but does very little to teach people how to write such articles. Most athletic trainers have ideas or experiences which, if properly developed, would make very interesting and informative articles. However, a lack of knowledge and experience in writing keeps many good ideas from being shared. The following suggestions have been formulated to help NATA members with their efforts to write journal articles.

BEFORE TAKING PEN IN HAND

All journal articles begin with an idea. Perhaps the trainer has a new theory about strength developement during the off season, or has returned an athlete to competition just a few weeks after ligament surgery, or has a question concerning the proper type of pregame meal. Before sitting down to write, however, the idea must be organized. Fishbein (12) reported that the number one reason for articles being rejected by medical journals was "poor organization, failure to follow outline." According to Archer (1), two of the characteristics of a rejected manuscript are lack of clarity and a disorganized presentation. If an author's efforts are to result in a successful, effective article, there must be an organized plan of attack. This approach includes formulating an idea, compiling a bibliography, writing an outline of what she/he wants to say, and then constructing an introduction, a body, and a summary or conclusions. Each of these sections will be discussed individually, followed by additional suggestions concerning the bibliography and manuscript construction.

The first step in the preparatory phase is the compilation of a bibliography. Whether it is a case report or a

Ken Knight was born in Moab, Utah. He graduated from Dixie Jr. College and Weber State College in 1967 and 1969, respectively. After graduation, he replaced the head athletic trainer at Weber State, and served there until 1973. From 1973 to 1976 he attended the University of Missouri - Columbia, where he was a graduate assistant in the Human Performance Lab, and where he was awarded a Ph.D. in Exercise Physiology in 1977. From 1976-1978 he was associate trainer and athletic training program director at the State University of New York College at Brockport. In the fall of 1978 he moved to Indiana State as an athletic trainer and associate professor.



question to be answered, a thorough literature search must be conducted. "You will not be able to write intelligently about any subject in medicine unless you know what has already been written about," claimed Beatty (2). He went on to give some very helpful information about how to search the literature utilizing *Index Medicus*, *Science Citation Index*, and other indexes which are found in the reference section of most good college libraries. Reference librarians are usually available to help people elarn the use of various indexes.

A literature search is not completed by looking in a few issues of an index though. Many journals, such as *Athletic Training* and *Scholastic Coach*, are not indexed by Index Medicus, and therefore, a potential author must also search the individual indexes of the journals not indexed by the major indexes.

A literature search should extend over the five most recent years of journals and indexes, and should include at least three or four key words related to the topic. Many of the articles referred to in the indexes will have promising titles, but will not relate to the present author's subject. However, once a few good articles have been found, their bibliographies will lead the author to many other articles. Complete bibliographical information for each promising article should be written on separate 5×8 note cards. This size will have room for ample notes when the article is read in detail.

All articles must be read before they are used as a reference. Even a good scientist, with the best of intentions, may misquote or misrepresent another author (18). Often this misrepresentation is carried on by an author who did not carefully verify his sources. Many articles will have to be read and discarded during the literature search in order to find a few good articles that directly relate to the present subject.

An outline should be used to guide the author in preparing the first draft. A general outline can be formed by arranging the bibliography note cards into an orderly and logical sequence. Then a detailed written outline should be constructed. This outline will not only help the author to write in a logical and sequential manner, but it will provide headings and subheadings, which are desirable in all but brief communications (9).

When writing the first draft, the emphasis should be on getting ideas on paper. Concern for details such as proper grammar, punctuation, and spelling will slow the author and cause her/him to lose important ideas or thoughts. Once the idea is on paper it is preserved. It can be organized, documented, and made readable later.

THE INTRODUCTION

The introduction is the most important part of a journal article (6, 16). If properly written, it will captivate the reader's attention, establish the reason for writing the paper, and provide a foundation for the rest of the article. It previews what is to follow. After reading the introduction, there should be no doubt in the reader's mind about what question the author is trying to answer or what problem she/he is trying to solve.



C

Shidle (16) advised journal authors to get the main idea of their article into one or two specific, positive statements, and then to use those statements (or a rewording of them) as the opening paragraph of their article. At times, however, an introduction will need to have more than one or two sentences to adequately introduce the subject. At any rate, no matter what the length of the introduction, one or two specific statements should be used to guide its construction.

BODY OF THE PAPER

The body contains all parts of the paper except the introduction and summary or conclusions. It should develop in a systematic fashion all details of the introductory remarks (6). The format of the body will vary according to the type of article being written, i.e., experimental report, literature review, case report, etc. (7). Suggestions for writing the body of the types of articles most commonly submitted to A thletic Training are as follows:

EXPERIMENTAL REPORT - The body of an experimental report must begin with a brief review of the literature. Such a review can either follow the introductory paragraph as part of the introduction, or it can exist as a separate section. Making it a part of the introduction is probably preferable, as long as the opening paragraph contains the specific problem with which the paper is concerned. In this type of review, the author relates briefly what others have done and why there is a need to solve the problem proposed. A great deal of detail should not be presented here. Findings of other researchers belong in the discussing section.

Next comes the methodology section. The author must explain clearly her/his experimental methods so the reader will fully understand how the data were collected. A reader will often look at data from a different point of view than did the author. In order to apply these data to her/his problem the reader must know the bounds and limitations of the data. A question that the author might ask is, "Could a trained person replicate this study from the information given?" If not, more information about methodology is needed. Neither results nor discussion of the experiment should be included here.

The results section should include (in summary form) all data collected, both positive and negative. If a statistical analysis is involved, a statistical text or reference should be consulted and referenced in the bibliography. Pertinent tables, figures, and graphs should be used liberally, but not repetitiously. A few well planned and carefully constructed illustrations can present data more concisely and completely than pages of printed matter. The following instructions for table construction were given by DeBakey (6):

"...the purpose of a table should be to arrange data of like characteristics in a more concise, intelligible, and vivid form than can be presented in the text. Its title should describe accurately the data it contains. The original number of cases (not just percentages or rates) should be given, and each column should be adequately labeled. Material that has been excluded, with reasons for its exclusion, should be clearly indicated..."

As with the methodology section, the author's comments should not be mixed with the results. Comments are reserved for the discussion section.

In the discussion section, the author relates her/his data to the problem or question posed in the introduction. Here is where the author comments about methodology and the results. Here the author compares and contrasts her/his data with the data of others, interjecting critical thinking where appropriate. The reader is told whether the data supports or refutes the stated problem, and reasons for support or rejection. New ideas or theses, based on the data, are proposed. Related studies are discussed, including those that are supported by, and those that are refuted by the present data. Should there be differences between the author's data and data reported in another study, possible reasons for these differences should be hypothesized.

LITERATURE REVIEW - A successful literature review paper must be highly organized. Similar studies should be grouped together and discussed in sections. Each major section should have a heading and a brief summary (possibly one sentence). Sections must be arranged so that they progressively focus on the problem or question posed in the introduction.

Implications of the literature relating to the present problem and the author's own thinking must be interspersed often enough and with enough detail that the reader's attention will be focused on the present problem. Care must be taken, however, to delimit the present author's own thinking so that the reader does not confuse it with a study or paper being reviewed.

CASE REPORT - The body of a case report includes two sections: 1) Report of the case and 2) Discussion (10, 15). Aspects of the case are narrated in a clear and straightforward style. In the discussion section, the author explains the unique and significant aspects of the case and correlates them with features of previous reports in the literature (15).

Both brevity and detail are important in a case report. This may seem like a contradiction, however, too often case reports contain the wrong information. The author must keep in mind the potential readership and the purpose of the report (as outlined in the introduction). Only information that bears on the case and the purpose of the case should be included. For instance, specific details about operative procedures are probably not needed in an article about rehabilitation. On the other hand, "the subject began a weight program as soon as she could flex her knee 100°" is incomplete. More detail is needed so that readers can compare the procedure with their own. A statement such as "On the fifth day after cast removal, the subject was able to flex her knee 100° and so was started on a progressive weight program" not only tells the criteria for starting the athlete on the weight program, but also how long it took to get her started. Details such as the amount of weight used, how much weight was added each day or week, how the subject reacted to various phases of the rehabilitation program, are reasons for writing a case report. Other trainers may have the same criteria (i.e. 100° flexion) for beginning a weight program, but if it takes their athletes ten days to achieve 100° flexion, the case report will give them food for thought.

The value of a case report to athletic trainers is that the reader can compare the author's techniques of injury management with her/his own. There may be something in the case study that she/he could use in treating her/his athletes, or perhaps the reader could contribute related information by writing a letter to the editor. Ideally, the case report will spur some readers to think, experiment, and discover new and even better procedures and techniques. Younger and less experienced athletic trainers and students benefit from knowing how various "veterans" handle situations. But these objectives can only be met if the case report is filled with lots of pertinent, specific detail.

Thompson (17) summed up the purpose of a case report in these words:

". . .be very specific with respect to information presented i.e., time lapses (time spent in a cast, on crutches, on isometrics) rehab data (type of exercise used, sets, repetitions and weight used) and therapy data, (temperature of cold baths, whirlpools, dosage of ultrasound, etc.). Specificity is the key to comparison. Without pertinent information, comparing becomes a guessing game."



SUMMARY AND/OR CONCLUSIONS

The summary and/or conclusions section is the second most important part of a journal article (5-7). Since some people read only the introduction and conclusions, these sections must contain, in a condensed form, the meat of the article. Also it is important that these sections be constructed so that someone reading only these sections will not be misled about the contents of the article. For those who read the whole article, the conclusion or summary should pull together what has been said in the body of the paper and leave the most important points clear in their minds (5).

A summary is best written in paragraph form, whereas the conclusions are usually presented as a numbered list (9). The summary should cite the pertinent points made in the paper. An effective way to do this is to go through the article page by page and extract the most important points. Conclusions, on the other hand, are logical deductions drawn from experimental or theoretical evidence presented in the body of the paper (9).

THE BIBLIOGRAPHY

The primary purpose of a bibliography is to lend credence to what the author says, however, a reference should not be given merely to prove that the authors is not lying (11). A bibliography gives readers additional sources. A reader who wants more information on a subject can look at the author's references and the referenced author's references and so on. Proper documentation gives readers not only the author's data and/or views, but also saves readers numerous hours of searching in the literature.

There are numerous formats of biographical presentation. Most journals require a specific format. Generally the "guide to contributors" section gives style information required by that journal; if not, any article within the journal can serve as a guideline.

ADDITIONAL HELPS

Even though the article has been organized and the first draft written, the author still has much to do. Making a manuscript flow clearly, logically, and economically from beginning to end is real work. All too often the reader wanders from one sentence to the next, wondering where the author is leading (4). The author ". . .must revise and continue to revise until he has a clear lucid and accurate account of his message (8)." DeBakey (6) quoted an editor as advising, "Write and rewrite; rewrite again and then revise." It is also helpful to have others critically read the article a time or two during the rewriting phase. Even if a person is not familiar with the subject matter of the article, she/he can evaluate the organization, sentence structure, phraseology, grammar, clarity, etc. Often, after struggling to get ideas on paper, an author will not be able to see flaws and weak areas that are obvious to someone else.

For those authors and potential authors who desire more detailed information about preparing manuscripts, there are numerous books and articles available. Woodford (18) has edited a manual on the teaching of scientific writing and O'Connor and Woodford (14) have written a text about scientific writing. Both works present a step by step approach to preparing manuscripts. King and Roland (13) compiled a series of short articles dealing with items of grammar and style for journal authors. Subjects in their book include: monotony, the passive voice, verbs, verbals, bloopers, rewriting, etc. A very detailed article by Booth (3) has particularly good sections on both form and style (i.e., literary style, choice of words, tense, mood voice, etc.), as well as an excellent annotated bibliography and, although it is over 20 years old, DeBakey's (6) paper on preparation of medical papers should be read by every

potential author.

An understanding of the editorial review process will also help potential authors to prepare their articles for publication. The *Athletic Training* review process was discussed by Journal Editor Clint Thompson in the Spring, 1976 issue of *Athletic Training* (17). Included in the article was a copy of the evaluation form used by members of the editorial board in evaluating articles (Figure 2 in Thompson's article).

SUMMARY

Successful medical and scientific writing requires thought and organization. Before an author begins to draft a manuscript, she/he must organize and outline her/his thoughts and ideas, as well as present the results of a systematic literature search on the subject. The paper must include an introduction, a body, and a summary and/or conclusions. The specific format of these sections depends on the type of article being written. After the first draft is on paper, extensive revision and rewriting must be done. Cox's (4) advice should be kept in mind while finishing the manuscript. She stated that an author should take readers"...by the hand verbally and lead them through the manuscript step by step....Mystery stories are best left to fiction writes."

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In an effort to promote scholarship among young athletic trainers, the National Athletic Trainers Association is sponsoring an annual writing contest.

- 1. This contest is open to all student members of the NATA.
- 2. Papers must be on a topic germane to the profession of athletic training and can be case reports, literature reviews, experimental reports, analysis of training room techniques, etc.
- 3. Entries must not have been published, nor be under consideration for publication by any journal.
- 4. The winning entry will receive a \$100.00 cash prize and be published in *Athletic Training* with recognition as the winning entry in the Annual Student Writing Contest. One or more other entries may be given honorable mention status.
- 5. Entries must be written in journal manuscript form and adhere to all regulations set forth in the "Guide to Con-

tributors" section of Athletic Training. It is suggested that before starting students read: Knight K L: Preparation of Journal Manuscripts. Athletic Training 11: 171-173, 1976. NOTE: A reprint of this article can be obtained by writing to either the author (at the address below, or from Rod Compton, Editor-in-Chief, Athletic Training.)

- 6. Entries must be received by March 1. Announcement of the winner will be made at the Annual Convention and Clinical Symposium in June.
- 7. The Writing Contest Committee reserves the right to make no awards if in their opinion none of the entries is of sufficient quality to merit recognition.
- 8. An original and two copies must be received at the following address by March 1, 1979.

NATA Student Writing Contest c/o Dr. K. L. Knight Men's Physical Education Indiana State University Terre Haute, Indiana 47809



Athletic Training Awareness

by Gerald W. Bell

Introduction

Increased concern for athletic injuries by the National Safety Council, Health, Education and Welfare Department (HEW) and the National Athletic Trainers Association (NATA) has brought requests for more long term injury studies. The requests are for studies of the injuries in concrete terms such as number of injuries per athlete, amount of time lost, time of day injured and type of equipment worn. Previous studies do not approach the people that deal (directly and indirectly) with athletic injuries, such as the athletes, coaches, trainers, parents and the community. It is important to deal with these people since the attitudes of those persons affected by athletic injuries influence a great deal what is done in the prevention and care of athletic injuries.

Statement of Problem

Little is known to the general public as to what athletic training is and how injuries can be prevented through proper training. Athletic injuries have been covered very superficially without including awareness by the coaches, athletes, trainers and parents of injury prevention.

Athletic training as defined by the NATA is the immediate and temporary care and prevention of athletic injuries. Many football parents have expressed appreciation to the athletic trainer for the handling of their sons' injuries. This appreciation is after an injury has occurred, but has the athletic trainer assisted in the prevention of athletic injuries? The athletic trainer must assist in educating the community involved in athletics and bring about an awareness that prevention and care of athletic injuries are rights of the athlete and not chance occurrences. The American Medical Association (AMA) recognize the rights of the athlete in 1959 in its Bill of Rights for the School and College Athlete. The first right concerns good coaching in regards to the safety of the athlete. It says:

The importance of good coaching in protecting the health and safety of athletes cannot be minimized. Careful conditioning and technical instruction leading to skillful performance are significant factors in lowering the incidence and decreasing the severity of injuries. Also, good coaching includes the discouragement of tactics, outside either the rules or the spirit of the rules, which may increase the hazard and thus the incidence of injuries. (p. vi)

Second of Machines V. 1900.

Gerald Wayne Bell is head athletic therapist and assistant professor, Department of Physical Education for Men at California State University, Sacramento, California 95819. He is an active member of the American Physical Therapy Association and a Certified Member of the National Athletic Trainers Association.



According to Arnheim (34), American college football has the highest injury rate per participant of any sport in the United States. This is an important fact when the amount of money spent on football equipment for the purpose of protection is considered. One of the problems is that this protective equipment is being used more as a weapon against the opponent. This is placing the athletic trainer in the conflicting position of fitting athletic equipment for the prevention of injuries and yet knowing that that equipment is also causing injuries. There is also the "play with pain" attitude which hinders proper care of injuries. The athletic trainer cannot care for injuries if the player does not allow him to.

Method

The method for carrying out the project was viewed in three phases: (1) planning, (2) implementation and (3) data analysis. During the planning phase the questionnaire was developed. The questionnaire was then revised and printed along with general group information sheets and explanatory letters.

The implementation phase consisted of administering the questionnaire to the 1976 California State University, Sacramento (CSUS) football squad. A mailing list of the football players' parents, the trainers of California District 8 members of the NATA, and the football coaches of the Far Western Conference (FWC) was obtained. The questionnaire was mailed to those trainers, coaches, and parents.

The sample populations for questionnaires returned totaled 83 football players or 100 percent, 35 athletic trainers or 85 percent, 48 coaches or 91 percent, 46 faculty of Health, Physical Education, and Recreation or 96 percent, and 67 parents or 84 percent.

Findings were presented to the FWC Athletic Directors and the Northern California Athletic Trainers Association.

Review of Literature

A review of literature found that research and writings in the area of football injuries fell into three specific categories. These areas are statistical studies of football athletic injuries, attitudes toward athletic injuries and the prevention of athletic injuries.

Statistical football injury studies were listed as percentages or injury ratios, such as injuries per 100 participants. These included 2, 3, 11, 12, 14, 15, 19, 21, 22.

O'Boyle (19) cites two injury reporting systems' statistics, NEISS (National Electronic Injury Surveillance System), which is the emergency room reporting system of over 100 East Coast hospitals and NAIRS (National Athletic Injury Illness Reporting System), which is endorsed by the National Collegiate Athletic Association and the National Athletic Trainers Association. From NEISS, O'Boyle states that "football injuries rank second behind bicycle accidents at emergency room admissions" and from NAIRS, "the significant injury ratio of college



football players is 36.5/500 participants and high school football players injury rate is 27.9/100 participants." O'Boyle continues, "Any injury, no matter how inconsequential should be thoroughly investigated to avoid long term injury...[and] while injury cannot be completely eliminated, it can be minimized by standard prevention programs."

After reading studies done by Ostaszewski (21) and Bowers (3), the investigator tends to believe that after suffering injury the athlete has little recourse but to tolerate the injury. Ostaszewski discovered that "over 600,000 high school football players are injured annually with only 10 percent receiving the best care available." The reason for so many epidemological studies in football "is it is a sport in which a single football coach or trainer controls the well-being of a large group of injury susceptible individuals."

Bowers relates that only 13 percent of all prep injuries from his sample were seen within 24 hours after injury. He recommends the employment of certified athletic trainers as a remedy for this situation.

Investigation of the statistics presents a startling fact that every participant in football has a 50 percent chance of being injured. The odds make the investigator ask why an athlete continues to participate in a sport where he so readily risks the possibility of physical harm. Thoughts related to parental pressure (34) and success in athletics (7, 13, 24, 34) included leadership by coaching to be extremely important (1, 7, 34) to avoid fear of injury. What is meant by the more realistic fears are the execution of a specific play and not the fear of injury as stated by the National Safety Council (1970) which said that "fear of injury often makes a player more susceptible to injury." This supports the statement that "injury causes an athlete to lose desire to return to athletics basically due to fear of pain . . . or fear of sustaining a handicapping injury" and "the coach and trainer need to combat fears by having the athlete work within his limits of injury." (9)

Gieck (34) (1971) writes that "motivation by a physical therapist (athletic trainer) may change the attitude of pessimism towards injury to one of optimism." This idea supplements reaction to athletic injuries. (6, 34) Drill believes the "reaction of the athlete to his injury immediately after it had happened is often an elucidation sign as to how seriously he has been hurt." Bender supports the inculcation of attitudes by peers when he states that "physical injury presents a problem to which an individual must respond in some adaptive way. The extent and quality of the reaction and adaptation of the individual to the injury is in most cases related to the severity of the injury, where the athlete may attempt to hide the injury or the injury may be used as a psychological shield. The immediate reactions to injury thus appear to be dependent in most cases on the kind and quality of past experiences and the characteristic nature and severity of injury."

We find additional supportive research for prevention of athletic injury by determination of techniques. Basically "many of the game conditions which lead to accidents can be prevented by setting up situations which stimulate the formation of positive attitudes." (8) From the Safety Educational Review, "Once an attitude has been instilled it has great carryover value for accident free participation in the student's later life." (28) The carryover of athletic injury prevention is through the inculcation of positive attitudes toward athletic injury and the continued practicing of these positive attitudes towards sports injury. In 1959, the American Medical Association stated "the assurance of proper care and rehabilitation of injuries (athletic trainers) in itself is not sufficient to justify rigorous sports in our schools and communities. Taking formidable risks without justification, no matter how complete the medical supervision, would be folly." The AMA further provides the athlete's Bill of Rights which includes careful coaching, good officiating, proper equipment and facilities and adequate health supervision. This includes proper medical facilities available for prevention and treatment of injuries that take place. (25)

Several articles cover the key physical abilities necessary for the prevention of athletic injury. Each article specifically states that risk of athletic injury exists in all sports. These include agility, safety, awareness, and flexibility (5, 10, 23).

Other criteria for the prevention of athletic injury was how the athlete handled himself during competition. (4, 16, 20, 31, 33) This includes game officiating as enforcement of game rules to prevent many injuries (26).

The National Safety Council in 1970 recommended coaches have "the background knowledge of football fundamentals and be qualified to administer first aid." An additional recommendation was the employment of "a competent team trainer at all practice sessions and a doctor on call." (p. 2)

The employment of athletic trainers at all levels has been the goal of the NATA since their reorganization in 1969 and 1970. Ryan (1975) points out that "athletic trainers coordinate the injury control program composed of the team physician, coach and trainer. His coordination of the injury control program leads to its success or failure, his skills need to be superior in therapeutic strapping and knowledge of protective equipment, rehabilitation of injuries and nature of sport where the acceleration of a player determines to some extent the number of injuries and their seriousness."

The importance of safety in athletics emerges as a direct responsibility of the athlete, coach and parent to instill positive attitudes toward athletic injuries. The athletic trainer emerges as a very key participant in the coordination of first aid, physical therapy and the team physicians. This involves paramedical and allied medical aspects and medical coverages.

The responsibility for safety rests with the educator, athletic director, coach, trainer, parent, athlete, and citizens of the community." (34)

All participants are responsible in the following of safety criteria for the safest possible athletic contest. Finally, "the compulsion to play when hurt is a badge of honor in all athletics. The most important element is to rid the athlete of misconceptions and inculcate the need for discipline until completely well." (34) We also need, as Ryan points out, to free amateur sports from the professional spirit of disregard of injury. (26)

Analysis of Data

The questionnaires were composed of a cover sheet and a fifteen question format. The cover sheet was composed of some similiar questions, such as "Have you ever had an athletic injury?", "Did the injury require surgery?", "Do you know what an athletic trainer's job entails?", etc.

The parent cover sheet totals indicate that 31 mothers and 36 fathers answered the questionnaire for a total of 67 parents. Twenty-one of the 36 (58%) fathers had played football and only two of the 67 (3%) respondents had not seen American college football played. Thirty-one of the 67 (46%) had suffered an athletic injury and seven (23%) of these injuries required surgery. On the questions concerning athletic trainers, 50 of the 67 (75%) had never spoken to an athletic trainer concerning their son and 38 of 67 (57%) did not know what an athletic trainer's job entailed.

As the question analysis demonstrates, beginning in Chapter 4, the parents generally agreed to questions one, two, three, eleven, twelve, thirteen, and fifteen. These questions dealt with the attitudes towards injury and its affect on the game of football, preparation of coaches, knowledge of conditioning and prevention of athletic injuries and proper funding of the sports program.

From the faculty of Health, Physical Education, and Recreation, there 46 questionnaires completed out of 48 (96%). Of the 46 responses 33 (72%) were male, 13 (28%) were female and 22 (48%) from Men's Physical Education, 13 (28%) from Women's Physical Education, 4 (9%) from Health and Safety and 7 (15%) from Recreation. Twentyfour (52%) of those who answered a questionnaire held doctorate degrees, 20 (45%) had master's degrees, and 2 (3%) had bachelor's degrees, 20 (45%) had master's degrees, and 2 (3%) had bachelor's degrees. Twenty-eight (85%) of the males had played American college football and all 46 (100%) had seen American college football played. Thirty-six (78%) had suffered an athletic injury with 71 (31%) requiring surgery, while only 6 (13%) did not know what an athletic trainer's job entailed.

The CSUS faculty generally agreed with question one, two, three, eleven, twelve, thirteen, and fifteen as did the parents when dealing with athletic injury, coaches' knowledge of athletic injuries and proper funding of athletic programs.

Forty-eight out of fifty-three (91%) football coaches returned answered questionnaires of which 30 (63%)were head football coaches and 18 (37%) were assistant football coaches. Eight (17%) had a bachelor's degree, 26 (54%) had a master's degree and 14 (29%) had a doctorate degree. Thirty-eight (80%) had greater than ten years coaching experience, 4 (8%) had seven to nine years experience, 3 (6%) had less than three years experience coaching. Forty-two (88%) had suffered an athletic injury of which 18 (44%) required surgery. The knee was the most frequently injured for 13 (72%).

The coaches, agreed with questions one, two, three, four, eleven, twelve, thirteen, and fifteen concurrent with parents and faculty, but also agreed that athletes should play with pain especially if it would not make the injury more serious.

The athletic trainers questionnaires totaled 35 out of 41 (86%). Thirty-three (95%) were working with football at the time of the questionnaire, 24 (69%) were certified members of the NATA and of those 24, 7 (20%) were certified by examination and the 17 (49%) others were certified by the grandfather clause. Ten (29%) were associate members and one (3%) was a non-member.

Work assignments included 8 (22%) at two year colleges, 24 (69%) at four year colleges and 3 (9%) at professional football. Educational levels were 12 (34%) with bachelor's or less, 20 (57%) with master's, 3 (9%) with doctorates and 10 (29%) were registered physical therapists.

Twenty-five (71%) played football of which 12 (34%) played at the college level, 21 (60%) had an athletic injury and 4 (20%) required surgery. The athletic trainers generally agreed with questions one, two, three, four, nine, eleven, twelve, thirteen and fifteen which followed the trend of dealings with athletic injuries. Question nine demonstrated the training of the athletic trainer to voice his opinion in the decision making process of a player playing while injured.

Eighty-three (100%) football questionnaires were completed and of these, 8 (10%) were freshmen, 8 (10%) were sophomores, 42 (51%) were juniors, 23 (27%) were seniors and 2 (2%) were fifth year seniors. Previous experience included 32 (39%) who played Pop Warner or Police Athletic League, 25 (30%) played junior high school football, 80 (96%) played high school football, 48 (59%) played junior college, 50 (60%) had experience at NCAA Division 11 and 5 (6%) had had experience at NCAA Division I.

For years playing experience, 64 (77%) had six years or greater, 17 (20%) had three to five years and ony 2 (3%) had less than two years playing experience. Fifty-nine (71%) had suffered injury, 11 (19%) required surgery

where 6 (55%) were knee surgeries. Only 43 (52%) had high school trainers and only 58 (0%) had team physicians. Only 45 answered questions about junior college medical staff. Of those only 3 (7%) did not have a trainer and 6 (13%) had no team physician.

The players generally agreed with questions one, two, three, four, five, six seven, eleven, twelve, thirteen and fifteen. As with the coaches and athletic trainers, the athlete deals with injury daily, his opinions were stronger, and he also felt it was best to learn the game competing against more experienced players and a better time to be injured. The athletes face the constant battle of having to perform while injured and realizing that they could be injured at any time, but most feel it is better to be injured in the "heat of battle."

From the cover sheets it can be seen that 46% of the parents, 78% of the faculty, 88% of the coaches, 60% of the athletic trainers and 71% of the athletes had suffered an athletic injury. Of those suffering injury the following percentages required surgery, 23% of the parents, 31% of the faculty, 44% of the coaches, 20% of the athletic trainers and 19% of the current student athletes.

QUESTION ANALYSIS

In this, an attempt is made to discern injury awareness in different populations who are directly involved with injuries to athletes. Those populations are football players, parents, coaches, trainers and physical education faculty. The available responses to the questions were Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD).

1. Athletic injuries are part of the game of football. They have to be taken in stride.

	S	A	1	4	1	D	5	D	TOTAL
	n	9%	n	%	n	9%	n	%	N
Parents	12	18	42	63	9	13	4	6	67
Faculty	5	11	24	52	8	17	9	20	46
Coaches	15	31	23	48	8	17	2	4	48
Frainers	9	26	18	51	8	17	2	4	48
Players	25	30	47	57	8	10	3	3	83
Players	25	30	47	57	8	10	3	3	83

A majority of all groups agreed with question one. Combined totals of strongly agree and agree are: parents 81%, faculty 63%, coaches 79%, athletic trainers 77%, and players 87%. The percentages indicate that those more closely associated with the sport of football are more readily in agreement with the statement.

2. If a player suffers an injury, he should see the athletic trainer immediately even though he may lose his position on the team.

	SA		Α		D		SD		TOTAL	
	n	9%	n	%	n	%	n	%	N	
Parents	49	73	15	21	4	6	0	0	67	
Faculty	36	78	8	18	2	4	0	0	46	
Coaches	37	77	11	23	0	0	0	0	48	
Trainers	29	83	5	14	1	3	0	0	35	
Players	24	29	45	54	12	15	2	2	83	

A greater majority of each group agreed with question two. Totals are: parents 94%, faculty 96%, coaches 100%, trainers 97%, and players 83%. It is more important to seek the services of the athletic trainer than continue to practice and possibly aggravate the injury further.

3. An athletic trainer should show concern when dealing with athletic injuries by giving proper first aid and consultation.

	S	A	ł	4	.1	D	S	D	TOTAL
	n	%	n	%	n	%	n	%	N
Parents	51	76	14	21	0	0	3	3	67
Faculty	43	93	3	7	0	0	0	0	46
Coaches	41	85	7	15	0	0	0	0	48
Trainers	33	94	2	6	0	0	0	0	35
Players	63	76	19	23	1	1	0	0	83



Nearly 100% of all respondents agree with question three. Combined totals are: parents 97%, faculty 100%, coaches 100%, athletic trainers 100%, and players 99%. This demonstrates that the athletic trainer's primary concern is the well-being of the student athlete.



	S	SA		Α		D		D	TOTAL
	n	%	n	9%	n	%	n	%	N
Parents	3	4	17	25	24	36	23	34	67
Faculty	2	4	8	17	19	41	17	37	46
Coaches	5	10	27	56	11	23	5	10	48
Trainers	3	9	17	49	12	34	3	9	35
Players	17	20	35	42	24	29	7	8	83

Question four finds that 70% of the parents and 78% of the faculty disagree with the statement. Sixty-six percent of the coaches, 58% of the athletic trainers, and 62% of the players agreed that an athlete should play with pain. This indicates those people more closely associated with athletic injuries have confidence that the injury can be protected from further injury and that football is a game of pain.

5. It is better for an athlete to be injured during a game rather than during practice.

	SA		A	Α		D		D	TOTAL	
	n	%	n	%	n	%	n	%	N	
Parents	4	6	14	21	33	49	16	24	67	
Faculty	2	4	7	15	17	37	20	43	46	
Coaches	5	10	9	19	19	40	15	31	48	
Trainers	2	6	5	14	20	51	8	23	35	
Players	14	17	28	34	29	35	12	14	83	

Question five finds 73% of the parents, 80% of the faculty, 71% of the coaches and 74% of the athletic trainers disagreed with the statement. Interestingly, 51% of the players agreed that it is better to be injured in the game rather than during practice. This indicates that the players realize their chances of being injured and if they are going to be injured, they feel better about it when it happens during a game, while the concensus of the other groups is that there is no "good time" to suffer an injury.

6. It is better for an athlete to be injured when he has made an outstanding play during a game.

	S	A	1	Α		D		D	TOTAL	
	n	%	n	9%	n	%	n	0%	N	
Parents	3	4	9	13	31	46	24	36	67	
Faculty	0	0	3	7	17	37	26	57	46	
Coaches	1	2	5	10	20	42	22	46	48	
Trainers	0	0	6	17	21	60	8	23	35	
Players	11	3	23	28	31	37	18	22	83	

All groups disagreed with the statement. Combined totals are: parents 82%, faculty 94%, coaches 88%, athletic trainers 83%, and players 59%. As with question number five all groups are in concurrence that there is no good time to be injured. However, 41% of the players felt if they were going to be injured, it might as well be while making an outstanding play.

7. Younger players (freshmen, sophomores) are best taught the game against a more experienced player who does not hold back.

	SA		1	Α		D		D	TOTAL	
	n	%	n	9%	n	9%	n	%	N	
Parents	7	10	20	30	26	39	14	21	67	
Faculty	2	4	8	17	17	37	19	41	46	
Coaches	3	6	6	13	20	42	19	42	48	
Trainers	2	6	5	14	20	57	8	23	35	
Players	22	27	28	34	27	33	6	7	83	

Sixty-one percent of the players agreed with question seven while 60% of the parents, 78% of the faculty, 82% of the coaches and 80% of the athletic trainers disagreed with the statement. This demonstrates the players opinions towards learning the game of football. An experienced player has a definite advantage in knowing the tricks involved to perform his position most efficiently and it is his thoughts that these tricks are best transferred through the young athlete's exposure to those older athlete's experience.

8. I feel good when an opponent has been injured and put out of the game.

	SA		Α		D		SD		TOTAL	
	n	%	n	%	n	%	n	%	N	
Parents	1	1	2	3	20	30	44	66	67	
Faculty	0	0	1	2	7	15	38	83	46	
Coaches	1	2	1	2	3	16	43	90	48	
Trainers	0	0	0	0	6	17	29	83	35	
Players	8	10	15	18	40	48	20	24	83	

Ninety-six percent of the parents, 98% of the faculty, 96% of the coaches, and 100% of the athletic trainers disagreed with question eight, while only 72% of the football players disagreed. This indicates the emotion involved with athletic injury and even though one often hears the team shout "Let's kill 'em," it is usually just a method of psyching up the team members. They may desire to win at all costs, but would rather beat the other team by defeating the team when it is at full strength with all starters playing than with the better players on the bench.

9. If I feel an athlete should play with an injury, I voice my opinion to the coach, trainer or team physician.

	SA		Α		D		SD		TOTAL	
	n	%	n	%	n	9%	n	%	N	
Parents	3	4	13	19	26	29	25	37	67	
Faculty	6	13	8	17	13	28	19	42	46	
Coaches	5	10	15	31	22	46	6	13	48	
Trainers	3	9	18	51	12	34	2	6	35	
Players	7	8	23	28	42	51	9	11	83	

Question nine found 78% of the parents, 70% faculty, 59% coaches, and 62% of the players disagreed with the statement, whereas 60% of the athletic trainers agreed that they would voice their opinion to the team physician. These results are probably due to the medical knowledge of the athletic trainers and their ability to judge whether an injury can be protected from further harm.

10. An athlete could play if the team physician would give him a pill to ease the pain.

	S	A	1	4	J	D	S	D	TOTAL
	n	%	n	%	n	9%	n	%	N
Parents	0	0	2	3	20	30	45	67	67
Faculty	0	0	2	4	16	35	28	61	46
Coaches	0	0	4	8	22	46	22	46	48
Trainers	2	6	5	14	11	31	17	49	35
Players	6	7	22	27	35	42	20	24	83

All groups disagreed with question ten. Combined totals are: parents 91%, faculty 96%, coaches 92%, athletic trainers 80%, and players 66%. This illustrates the anti-drug position of all those involved. Medications play an important part in the healing process, but not to enable an athlete to continue to compete and mask his own body's mechanism to assist the healing process.

11. I feel bad when a starting player is out with an injury when he is on our team.

SA		ł	4	D S		D	TOTAL	
n	%	n	%	n	9%	n	9%	N
14	21	43	64	8	12	2	3	67
23	50	18	39	2	4	3	7	46
22	46	22	46	3	6	1	2	48
13	37	19	54	3	.9	0	0	35
31	37	41	49	9	11	2	2	83
	S n 14 23 22 13 31	SA n % 14 21 23 50 22 46 13 37 31 37	SA A n % n 14 21 43 23 50 18 22 46 22 13 37 19 31 37 41	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

All groups agreed with question eleven. Combined

totals are: 75% parents, 89% faculty, 92% coaches, 91% athletic trainers and 87% of the players. This demonstrates that the closer the interpersonal relationship the better able we are to have empathy for the injured athlete.

12. Coaches should have a working knowledge of athletic injuries and their care.

	SA		1	4		D SD		TOTAL	
	n	9%	n	9%	n	%	n	%	N
Parents	38	57	28	42	1	1	0	0	67
Faculty	36	78	9	20	1	2	0	0	46
Coaches	36	75	11	23	0	0	1	2	48
Trainers	19	54	13	37	3	9	0	0	35
Players	49	59	31	37	3	4	0	0	83

Over 90% of all respondents agreed with question twelve. Combined totals are: parents 99%, faculty 98%, coaches 98%, athletic trainers 91%, and players 96%. Athletic trainers are not the panacea of the care of athletic injuries. The coaches need to have a working knowledge to understand the position of the athletic trainer and have a working relationship with the medical team, doctor, athletic trainer and general health services.

13. Injuries can be prevented or held to a minimum if the athlete has trained and conditioned properly.

	S	A	1	A		D	5	D	TOTAL
	n	%	n	%	n	%	n	9%	N
Parents	50	75	15	22	2	3	0	0	67
Faculty	29	63	15	33	1	2	0	0	46
Coaches	33	69	14	29	1	2	0	0	48
Trainers	24	69	11	31	0	0	0	0	35
Players	46	55	30	36	5	6	2	2	83

Over 90% of all of the groups agreed with question thirteen. Combined totals are: parents 97%, faculty 96%, coaches 98%, athletic trainers 100%, and players 92%. Again proper training regimens by the athletes can and do lead to optimum injury prevention. The educational process of becoming aware of preventative techniques and practicing them diligently is endorsed by all the groups of the study.

14. Athletic trainers for the care of athletic injuries are not needed at the high school level because this is the coaches' responsibility.

	S	A		A]	D	S	D	TOTAL
	n	9%	n	9%	n	9%	n	%	N
Parents	3	4	1	1	21	31	42	63	67
Faculty	0	0	1	2	4	9	41	89	46
Coaches	2	4	0	0	10	21	36	75	48
Trainers	1	3	0	0	3	9	31	89	35
Players	5	6	8	10	26	31	44	53	83

A majority strongly disagreed with the question. Combined totals are: parents 63%, 89% faculty, 75% coaches, 89% athletic trainers and players 53%. As the coaches are placed in a position of conflict by determining if an athlete should play or not and continue coaching during an athletic contest, a very dangerous and serious situation develops. It is the concurrence of all groups that athletic trainers are needed at the high school level for the care of athletic injuries to reduce the seriousness and possible tragic results of conflict of medical concern.

15. Sufficient funds should be allocated for the best equipment available for the prevention of athletic injuries.

TOTAL
N
67
) 46
) 48
) 35
83
1))))

204

SUMMARY AND CONCLUSIONS

The purpose of this project was to make people, indirectly or directly, aware of the profession of athletic training and athletic injuries. Planning, implementation and data analysis were the methods used to complete the project. Planning involved the investigator's development of a questionnaire to be administered to the football players of California State University at Sacramento, to a random sample of parents of the football players, to the faculty of Health, Physical Education and Recreation at California State University at Sacramento, athletic trainers of Northern California District Eight and coaches of the Far Western Conference and selected junior colleges. Implementation started August 30, 1976, and was completed by October 24, 1976. Data analysis began March 1, 1977, and ended April 1, 1977. The findings indicate that the majority of the groups were aware of the profession of athletic training and athletic injuries except for the parents of the football players. Seventy-five percent had never spoken to an athletic trainer and 57% did not know what an athletic trainer's job entailed. Only six percent of the faculty did not know what an athletic trainer's job entailed.

Those people not knowledgeable of athletic training were exposed to questions that created an opinionated answer towards athletic training and athletic injury. The questionnaire contained a brief definition of what athletic training is and what an athletic trainer does. The questionnaire was written with the idea of giving information to the reader as well as asking an opinion. Upon completion of reading the questionnaire the respondent had additional exposure to what athletic training entails and athletic injuries. The format indicated that those people more closely associated with the athletic training athletic injury situation were more strongly agreeable or strongly disagreeable whereas the parents were less opinionated in their attitudes towards athletic injury. The questionnaire gave these individuals the opportunity to become aware of and learn something about the athletic training program at CSUS. There was also the opportunity to see that the athletic training program is concerned with the individual rather than the specific rate of athletic injury.

The investigator assumes the parents love their children, but the questionnaires did not indicate a great deal of concern for sports injury. It is necessary for the parents to be concerned and require maximal coverage for the safety and welfare of the athlete by demanding the employment of certified athletic trainers in schools with interscholastic athletics.

The responsibility of the faculty is to maintain high academic standards and screening of the athletic training students in order to provide opportune educational experiences in critical areas of proper rehabilitation and care of the injured athlete. The faculty often rely upon personal experiences rather than acquiring proper knowledge in the total aspect of athletic training. This is a trend that definitely needs to be reversed and can be with the help of the athletic trainers in the universities and community. This is where the athletic trainer must take the lead and be aggressive in educating the athletic community in the care of athletic injuries. This investigator believes that currently there is a disregard for athletic injuries and the athletic trainers must work together to



change this situation. Coaches especially must be updated in emergency and life-threatening injuries due to possible litigation if they are irresponsible. Each and every injury has the possibility of a tragic outcome if the injury is not handled properly.

Players often continue playing when injured if they fear they will lose their place on the team, if there is peer pressure or if they feel their loyalty to the team is being tested. The players must accept the fact that medical services are rights and it is their responsibility to seek medical attention and then do what the doctor or athletic trainer recommends.

The project assisted the investigator in realizing what attitudes people have toward his job and in realizing the desire for additional knowledge in the area of prevention of athletic injuries and interpersonal relationships with those athletes that have suffered an athletic injury. The project has also assisted in discussing athletic injuries with parents, coaches, and fellow athletic trainers by providing a knowledge of the common basis of attitudes so that the investigator may be better able to deal with those attitudes when necessary.

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The Supportive Effects of Modified Duke Simpson Strapping

by SUSAN E. ROSS, A.T., C. Assistant Trainer Towson State University

Introduction

Athletic training in the past has often been synonymous with the use of adhesive strappings to protect and support athletic injuries. The idea of prophylactic support was first utilized by U.S. Army physicians in the 1880's to protect and support fractured or sprained ankles, an idea which was greatly expanded upon with the advent of organized athletics in the late 19th century. (6, 13)

Taping of athletes before competition became part of the tradition of the game. Recently, however, this practice has been criticized as being of little value as a supportive or preventive medium, and an unnecessary expense.

The knee joint, being the largest joint in the body and the most vulnerable to injury especially in contact sports, (6), has been the focus of many different styles of adhesive strapping. It has been the acceptable practice, although of purely subjective opinion, that strapping a knee after an injury helps support it and protect it from reinjury.

In a pilot study done by Kittleson *et. al.* (5), it was concluded that "a fresh, stiff tape support gives no apparent stability to the knee." As part of the Penn State knee study, Meaci (10) found that tape gave no appreciable support to the knee in abduction and adduction after five minutes of vigorous exercising.

Tipton (20) found significant support of the knee immediately after taping, with loss of support after five minutes of exercise in abduction. However, there was still significant support of the knee in abduction, even after exercise.

Due to the lack of scientific studies done on the effectiveness of knee taping, and to the general controversy over the value of preventative strapping, the present study was developed. However, two elements not present

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in prior literature were added: the use of orthopedic felt combined with tape and the limitation of the knee joint in extension and hyperextension.

Review of Literature

The knee has undergone many changes as man evolved from a quadruped to a biped. "Mechanically, the knee is a compromise between great stability in complete extension and great mobility after the achievement of flexion... The poor degree of interlocking of the surfaces – essential for great mobility – renders it liable to sprains and dislocations." (4)

Due to its structure, the knee cannot rely on boney contact to limit hyperextension, as with the elbow. Therefore, it must rely on the support of the joint capsule and surrounding ligaments, and secondarily on support from the periarticular musculature. (17)

The mechanisms of a hyperextension sprain are forces which extend the knee beyond its normal range of extension. (18) "The most common cause is a blow to the front of the extended leg, with the foot firmly fixed to the ground and with the weight of the body carried forward by its own momentum." (19)

... "Hyperextension of the knee throws initial tension on the posterior ligament (capsule) of the joint, followed by stress against the posterior cruciate ligament and the posterior part of the two collaterals if the hyperextension continues." (11) In addition, if the force is directed at the femur, pushing it backward on a fixed tibia, the anterior cruciate ligament may tear. (9)

During the repair stages of these structures, O'Donoghue recommends twelve to fourteen weeks of healing time, in which the joint is immobilized, the degree of damage being the governing factor. For rehabilitation, "active phyical therapy, increasingly active use, protective strapping and re-education are of all importance." (11)

Even after rehabilitation is complete, strapping is recommended for prevention of reinjury, with a twofold purpose. (2, 6, 8, 11) The primary purpose is to provide an external support which approximates the function of the injured structures. A secondary purpose, which has only recently been postulated is to provide kinesthetic feedback via tension on the skin as the joint approaches the extreme range of motion.





the muscular support to be brought into action against any sudden force. If the ligaments are weakened by previous injury, the abnormal motion is well under way before the proprioceptive stimulus is given." (8) A theory which needs further research is the ability of tape to approximate, via sensory stimulation from the pressure of the tape on the skin, this proprioceptive response. In order for this to occur, some relearning to respond to the stimulus must take place within the athlete.

Only eight relevant studies were found in the literature on the supportive effects of adhesive strappings. Five of the studies were concerned with ankle straps and wraps. The three investigations on knee strappings were concerned with support of the knee in abduction and adduction.

Rarick, et. al., (12) and Malina et. al., (9) compared various strapping and wrapping techniques for the ankle. Both studies took measurements of ankle movement before and after taping, and after five to ten minutes of vigorous exercise. The measuring instrument consisted of a cable attached to a football shoe worn by the subjects and the ankle was moved by manually manipulating the cable. A cable tensiometer recorded the amount of tension during ankle movement. It was noted in both studies that a given force produced less movement in the ankle after taping. However, after exercise, the same amount of given force produced considerably more movement, as forty percent of the net supporting strength of the strappings was lost. (9, 12)

Simon, (16) studied football players during spring practices in 1967 and 1968 to compare the effectiveness of ankle wraps and ankle straps in prevention of sprains. The number of injuries to athletes who were wrapped and the number of injuries to athletes who were strapped was not found to be statistically significant. It was concluded that there was no difference in support between ankle wraps and ankle straps.

Using a device and methods similar to Rarick and Malina, Libera (7) tested the effects of football practice on various ankle strapping and wrapping techniques. He found that all treatments substantially lost support (27% or more) after practice. However, the basketweave with heel lock strapping maintained 72.5% of initial support, while the other methods were about 65% effective. Libera's control of no protection also reduced after practice to 64% of initial support. It is interesting to note that the basketweave with heel lock strapping maintained better postpractice support than no protection at all.

Garrick and Requa (3) studied 2562 intramural basketball players with respect to incidence of injuries using ankle strapping prevention. They also took into consideration whether the players wore low- or high-top shoes. They found that high-top shoes combined with taping had lower incidence of sprains than taping with low-top shoes, which had fewer resultant sprains than no taping. They also noted that subjects who had suffered previous sprains seemed to be more protected by the taping and shoe height than those with no history of sprains.

Tipton, (20) tested the effectiveness of a modified Gibney technique of knee strapping before and after exercise. The knees of ten varsity basketball players were measured before taping, after taping, after exercise, and after tape removal, by a photographic method. It was found that knee abduction and adduction were significantly reduced at the .05 level. After exercise, abduction increased; however, adduction continued to be restricted. (20)

Kittleson *et. al.*, (5) in a pilot study, used a television fluoroscope with video tape to measure the effectiveness of knee strappings. They concluded after testing that adhesive strapping did not support the knee joint. (5)

Meaci, (10) compared the supportive effects of cloth and

elastic strapping alone. Immediately after strapping, both methods of taping showed significant (.05 level) restriction of abduction and adduction at the knee. After five minutes of exercise, neither method of taping showed any significant support. (10)

Overall, the investigators agree that immediately after strapping, there is significant support in adhesive strapping techniques. After exercise, there is some descrepancy. Most agree that the amount of support decreases considerably, with the exception of Tipton, who found that knee adduction had support even after exercise.

In an injury incidence study, Garrick and Requa found that subjects who wore high-top shoes and were taped had a lower incidence of sprains than the untaped group.

It seems that a controversy exists. Scientific studies conclude that tape has little or no support, while practical application studies show favorable affects of taping with regard to prevention. It is clear that more research is needed in this area.

Purpose

The purpose of this study was to measure the effectiveness of orthopedic felt combined with adhesive strapping in supporting the knee joint. The study was conducted at Springfield College between April 11 & April 22, 1977. The subjects were sixteen volunteer female physical education majors. The right knee of each subject was evaluated at rest in extension and hyperextension. Measurements were taken with an electrogoniometer before and after application of a modified Duke Simpson taping technique, and following three successive periods of exercise. Comparisons of the data were made by statistical analysis.

Definitions

"Extension is defined as movement of the posterior portion of the lower leg away from the posterior portion of the thigh, so that the lower leg and the thigh are in a straight-line relationship." (4) Kapandje calls this the position of reference.

For the purposes of this study, extension was defined as the angle between the tibia and the femur when the subject was lying prone on a level table, with the feet over the edge of that table. This reading was always the position of reference for measuring the amount of hyperextension, and was given as zero degrees.

Hyperextension, or as Kapandje calls it, passive extension, is the point at which the extension angle between the posterior tibia and the posterior femur increases by five to ten degrees, past the position of reference. (4)

For this study, hyperextension was defined as the angle between the posterior tibia and the posterior femur when the subject was lying prone on an even table, with the lower legs (from six inches above the knee joint line to the feet) nonsupported over the edge of that table.

An electrogoniometer is "a goniometer in which a potentiometer has been substituted for the protractor." (1) It can measure joint angles in stationary positions, and can record the changes in degrees of joint angles during motion.

The modified Duke Simpson strapping technique (2) for the knee is one in which a felt pad (Figure 1) is placed behind the knee in the popliteal space, with split arms that wrap around the joint, being placed above and below the patella. (Figure 2) The pad is secured with adhesive strips, which also contribute to limiting hyperextension of the knee.

The exercise periods in this study were three periods of five minutes. Each period consisted of three minutes of jogging of a treadmill at five miles per hour, followed by two minutes of walking at two miles per hour. After each exercise period was a five minute rest period, in which the subject rested in the prone position on a table while the measurements were being recorded.

Methodology

The parameter measured in the present study was the change in the knee joint angulation from resting extension to resting hyperextension. This was selected as a measure for before and after taping and after exercise based on the principle that effective taping limits the extreme range of motion. The electrogoniometer (also elgon) was selected as the measuring instrument due to its ability to record the changes in degrees of joint angles during motion. The elgon was connected with a direct current preamplifier to one recorder channel of a physiograph. The elgon was calibrated with physiograph recorder at one degree of movement equal to each one-half centimeter block on the recording paper. A clear plastic ruler was placed over the goniograms to read the amount of joint movement to the nearest one-half of a degree.

There were two measurements taken to determine knee hyperextension. The first measurement was taken with subject lying prone on the table in extension, and the physiograph recorder was centered to the zero point. The second measurement was taken with the subject lying prone with the knees and lower legs in non-support. The difference between these two readings were recorded in degrees as the amount of hyperextension. These two measurements were taken five times: before taping; after taping; after five minutes of exercise; after ten minutes of exercise; and after fifteen minutes of exercise.

The taping technique selected was a modification of the Duke Simpson knee strapping as described by Cerney. (2) All strapping was done by the author.

Each subject was asked to shave her leg from six inches below the knee to six inches above the knee. With the subject standing, lines were drawn from the greater trochanter of the femur to the lateral condyle of the femur, and to the lateral malleolus of the fibula, for placement of the electrogoniometer. The subject's leg was sprayed with tape adherent. The elgon was placed with the pontentiometer directly on the lateral condyle of the femur, with the arms centered over the reference lines. The elgon was secured with four spiral strips of tape. All tape used in the study was one and one-half inch tape.

In the modified Duke Simpson technique, a pad was made out of one-half inch orthopedic felt. Since the subjects were females, the dimensions were smaller than recommended by Cerney. (2) As the pad was fitted to each subject, modifications were made to improve the fit, if necessary.

Each subject placed her right heel on a two inch heel lift, with the weight evenly distributed on both feet. The felt pad was placed directly behind the knee in the popliteal space, with the arms wrapping around the knee to be placed above and below the patella. The arms overlapped, and the pad was held in place with three splittailed strips of tape.

Anchor strips were placed around the leg six inches above and below the knee. Six knee spirals — three right and three left, were added, crossing behind the felt pad in the popliteal space. Two more anchors were added to complete the taping technique.

Limiting Factors

The ability of the subjects to completely relax while the measurements were being taken was a critical factor. If the subject had tension in the knee flexor muscles while being measured, the actual amount of passive hyperextension could not be recorded.

Another factor related to each individual subject was her predisposition to sweating during exercise. Some subjects began to sweat right away, while others did not sweat at all. The amount of sweating affected the tape's adhesive properties, and therefore the amount of support.

The atmosphere of the testing area was a third limiting factor. Changes in heat and humidity between testing times could have affected the subjects with respect to sweating.

Since all the subjects were female volunteer physical education majors, any conclusions concerning the data were limited by this fact.

Results

Due too high subject mortality and equipment breakdown complete sets of data were collected from only nine of the sixteen subjects. Therefore, only nine items were used in the statistical analysis. As originally planned, a repeated measure analysis of variance was used for the analysis. (14) However, because of the small amount of data, a Friedman Two-Way Analysis of Variance was also computed. (15)

The repeated measures F-ratio showed significance at the .01 level. (Table 1) A Newman-Keuls multiple com-



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TABLE I REPEATED MEASURES ANALYSIS OF VARIANCE SUMMARY TABLE

Source	SS	df	MS	F	Probability
Treatments	50.1864	4	12.547	6.035*	.01
Subjects	54.211	8	6.776		.01
Error	66.514	32	2.079		
Total	170.9114	44			

Table F(.01)(4, 32) = 3.97

parison test for significant main effect was then computed to show which specific differences were significant. (14)

The Newman-Keuls comparison showed significant differences at the .05 level between the means of pre-tape and post-tape, pre-tape and post-five minutes exercise, and pre-tape and post-ten minutes exercise, indicating that the tape provided support up to ten minutes of exercise. The pre-tape and post-fifteen minutes exercise difference was not significant, indicating that support had diminished. (Table 2)

Two subjects showed extreme deviance of data, due to problems within the study. In one subject, the goniometer visibly slipped out of position, which affected the recordings. The other subject had no detectable movement of the goniometer. The observed deviance was felt to be due to her failure to totally relax her leg during the measurements, since the equipment calibrated very closely after the testing.

For interest's sake, these two pieces of data were eliminated, and the statistical analyses were repeated. On

TABLE II **NEWMAN-KEULS MULTIPLE COMPARISON** SUMMARY TABLE

		Pre-	Post-	Post-	Post-	Post-
Means		Tape	Ex. 15	Ex. 10	Ex. 5	Tape
Pre-Tape	4.611		1.171	2.333*	2.391*	2.941*
Post-Ex. 15	3.44			1.162	1.22	1.77
Post-Ex 10	2.278				0.158	0.608
Post-Ex. 5	2.22					0.55
Post-Tape	1.67					

* significant at .05 level

the basis of face validity, since the error term reduced by half in the second analysis, this data was used for discussion and conclusions.

The F-ratio again showed significance at the .01 level. (Table 3) The Newman-Keuls comparison showed significant differences at the .05 level between all of the means, indicating that there was still significant support even after fifteen minutes of exercise. (Table 4) Again, the Friedman Two-Way Analysis of Variance was significant, this time at the .01 level.

Conclusions

Within the limitations of the study and based on the results obtained in an adjusted statistical analysis, the following conclusion was made:

There was significant difference at the .05 level between the means of knee hyperextension measures taken on seven female physical education majors at Springfield



College, before taping, after taping, and after five, ten and fifteen minutes of exercise. Therefore, based on this study, it can be concluded that the modified Duke Simpson taping technique was effective in limiting the extreme range of motion of hyperextension of the knee.

ADJUSTED STATISTICAL ANALYSIS

TABLE III REPEATED MEASURES ANALYSIS OF VARIANCE SUMMARY TABLE

Source	SS	df	MS	F	Probability
Treatments	62.026	4	15.507	12.096*	.01
Subjects	32.743	6	5.457		
Error	30.774	24	1.282		
Total	125.543	34			

Table F(.01)(4, 24) = 4.22

TABLE IV NEWMAN-KEULS MULTIPLE COMPARISON SUMMARY TABLE

	Pre-	Post-	Post-	Post-	Post-
	Tape	Ex. 15	Ex. 10	Ex. 5	Tape
5.571		2.142*	3.071*	3.428*	3.642*
3.429			0.929	1.286	1.500
2.500				0.357	0.571
2.143					0.214
1.929					
	5.571 3.429 2.500 2.143 1.929	Pre- Tape 5.571 3.429 2.500 2.143 1.929	Pre- Tape Post- Ex. 15 5.571 2.142* 3.429 2.500 2.143 1.929	Pre- Post- Post- Tape Ex. 15 Ex. 10 5.571 2.142* 3.071* 3.429 0.929 2.500 2.143 1.929	Pre- Post- Post- Post- Tape Ex. 15 Ex. 10 Ex. 5 5.571 2.142* 3.071* 3.428* 3.429 0.929 1.286 2.500 0.357 2.143 1.929

* significant at .05 level

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Discussion

The results obtained from this study seem to contradict the findings of the researchers who found that support diminished after exercise, as concluded in studies done by Rarick and Malina Tipton, Kittleson, and Meaci. The exception found in Kittleson's study, that support still existed (in knee adduction) after exercise, is supported by the results of this study. It is important to keep in mind that while only tape was used in the other studies, this study combined felt with tape as a mechanism of support. It is also important to keep in mind that this study measured the knee joint in extension and hyperextension; prior studies measured the ankle in inversion/eversion, or the knee in adduction/abduction.

This study is not adequate by itself to be a basis for future conclusions. It does provide a good basis as a pilot study for future research. However, some modifications are necessary to limit the high subject mortality rate.

1.) A larger scale study needs to be done to establish true significance using at least 30 subjects.

2.) In order to prevent the goniometer from slipping out of place during the exercise periods, a more secure method of holding the elgon in place needs to be devised; or a method of holding the elgon so that it can be realigned before each measurement.

3.) A more sophisticated mechanism for hyperextending the knee, such as the use of a tensiometer would improve the true range of motion for a given force.

4.) A more sensitive potentiometer, incorporated into the electrogoniometer, would increase the ability of the instrument to record the small changes from extension to hyperextension.

5.) It would be of value to study male subjects also.

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Policies and Procedures Are Necessary in the Training Room

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Modern society has made each one of us acutely aware of the fact that we are responsible for our actions. This is especially true in areas where a service is performed for other people.

The modern athletic trainer must be concerned with all aspects of the total health care of the athletes. Attention must be given not only to prevention, treatment and rehabilitation of athletic injuries but also to the health care delivery system, interdepartmental relationship, educational needs and community relationships. There are many pieces of literature in circulation that concern themselves with the care and prevention of athletic injuries but nothing concerning the health care system.

Problems are continually arising in the medical care for the athletes of any intercollegiate program. Decisions must be made constantly regarding the care and prevention of athletic injuries. The certified athletic trainers are called on to make these decisions. Sound guidelines or basic reference information is necessary for decision making. Some universities provide this information through soundly conceived and developed policies and procedures.

Establishing policy may be described as "formalizing departmental attitudes toward specific types of repetitive problems as guides to decision making." It is important to differentiate between policy and procedure. Policies form the basic framework of principles and rules to be used as reference information for decision making. They guide the certified athletic trainer in a consistent and continuing pattern of decisions and direction of thought. Policies supplement each other. Over a period of years, policies form

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"a body of law" which expedites departmental decision making.

If properly selected and developed, policies enable each member of a department to know what duties are to be performed, the type of behavior that will result in the greatest productivity for the department, how best the department goals can be accomplished, and the procedure by which accountability can be established and evaluated.

A procedure is "the manner or way of performing anything, a process, method, or tactics." Well-defined procedures are important in any athletic department to direct the certified athletic trainer in the performance of his duties. Because they tend to overlap, procedure is often confused with policy. A procedure essentially describes how to do something, whereas a policy is part of a framework of general principles, that is, the why behind decision making. Frequently, a written policy will include procedural information which describes how to implement a policy. A written procedure will sometimes include information on why certain procedures are necessary.

In many universities, clear policies exist even though they are not written. Through on-the-job training and supervisory practice and precedent, an athletic trainer learns the guideposts which channels his efforts towards desired ends. These quideposts may be called "informal policies." In fact, many universities do not get around to writing their policies and some that do, fail to keep them revised and up to date.

A major problem with so-called informal policies is that control is lost too easily. Unwritten policies take on a folklore quality and are easily subject to reinterpretation to meet expediencies. In addition, the fast pace of today's world requires new trainers at a university to assimulate quickly the basic departmental values and philosophy.

Although athletic trainers should be guided by departmental policies, the reason for any action should be explainable on its own merit. It must be remembered that policies are broad guides - and only guides - which exist to channel the thinking of personnel charged with making decisions. Policies then, are not a set of inflexible rules; instead, they are the living precepts which guide a department in a continuing and consistent pattern of behavior.

At the present time some schools are providing students with new freedoms, rights, and privileges, which make existing policies outdated and obsolete. In this light, change may be needed. Although the original policies were well thought through and carefully formulated, they may have to be reviewed periodically in the light of any new developments that occur in an intervening period.

Procedure Manual: A Management Concept

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Health care is one of the fastest moving sectors of today's society in terms of development and usage. Athletic training is a component of that sector in delivering health care to the athlete. In order to proficiently deliver health care to the athlete, the athletic trainer must be an acknowledged administrator, capable of managering personnel and material resources in performing necessary duties.

The external factors of 1) budgetory expenditures in supplies and equipment coupled with capital costs, personnel, and 2) a growing demand for services through the development and recent emphasis of women sports and other athletic programs, have further pressured the athletic trainer into being cognizant of the administrator's role and responsibility.

The establishment of a policy and procedural manual can be a valuable tool in aiding the athletic trainer to be an effective administrator. It is an essential ingredient in the planning, organization, and evaluation of any task which the athletic trainer performs.

A policy and procedural manual is a document which in the medical and health care sector evolved from requests by regulatory agencies (Joint Commission on Accreditation of Hospitals, insurance companies, etc.) for formal departmental rules and regulations that standardize the mode of operation and assuring, to a certain extent, delivery of quality health care.

Policy serves as a criterion on *what* is to be done. Procedure compliments policy as defining *how* things are to be done. Since verbal policies and procedures are prone to individual interpretation which leads to variable results, a written manual is prefered as it offers specific concise control. Such an organizational document resists arbitrary decisions on administrative matters that over a period of time result in conflicting situations.

A policy and procedural manual should be written by the athletic trainer consulting with the athletic director, the team or institutional physician, and any other medical or administrative position directly involved with the athletic training program. To insure medico-legal correctness, this document should be reviewed by an attorney for the institution.

The policy and procedural manual can be divided into four parts:

- 1. Statement of purpose or function.
- 2. Personnel policies.
- 3. Operational procedures.
- 4. Fiscal policies.

The introductory statement of purpose or function is the definition of philosophy from which an athletic training program operates. As a measure of justifying the presence of an athletic training program, this statement

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of function defines that program's role within the context of that institution's athletic program. An athletic program in an educational institution operates within harmony of it's academic objectives. As the athletic training program operated as a service activity for a particular athletic program, it must insure that it's objectives are compatible with both the athletic department and in a larger scheme with the institution's academic objectives.

In the formulation of the statement of purpose, one is concerned with the following points:

- 1. Purpose of the program defining the degree and measures of involvement in the care and prevention of athletic injuries to participants in the athletic program. It specifies if care is extended to the athlete during the off season, and if so the mechanism of referral and treatment.
- 2. Intra-institutional status clarifies the involvement of the athletic training program with treatment to students, staff, and faculty and the manner of referral and medical direction during treatment. If the athletic training program serves as a clinical setting for an athletic training curriculum or any other educational program, it should specify the criteria for supervision and evaluation of students, and the students' level of involvement in the management of athletic injuries.
- 3. Community relationship often an established athletic training program is requested to make available its resources to individuals from outside the institution. High school, amateur, and recreational athletes, are individuals who often lack the accessibility to a formal sports medicine program and approach the athletic trainer for health care. To prevent abuses and hindrances in the operation of the training room facility, there should be stipulated the extent outside parties are allowed to use the services of the training room and staff.
- 4. Educational activities as in any health care profession, athletic trainers should exert the opportunity for involvement on a formal and informal basis on educating those associated with athletics to the aims, objectives of athletic training. This form of public relations can be achieved through many forums: clinics, workshops, articles, and media presentation on radio and television. Also there should be stated the understanding that the athletic trainer must have the opportunity to maintain and update his clinical expertise through involvement in appropriate educational and professional programs.

Personnel Policies

Concise description of personnel policies is essential in maintaining a harmonious operation through formal recognized guidelines for job descriptions, job qualifications, salary and benefits, and hiring mechanisms. Other material included in this section are standards for evaluation and promotion of staff. A line chart depicting an organizational and reporting system clarifies supervisory and peer relationships by indicating who reports to whom and under what circumstances (fig. 1). For example, the student athletic trainer would report to the staff or head athletic trainer on medical and administrative problems. In turn the athletic trainer reports to the athletic director on administrative matters but to the team or referring physician on medical problems and situations.



Athletic Director (Administrative) Athletic Trainer Student Trainer

The job description is a most important part of this section, as it informs the individual on qualifications and responsibilities assigned to the position. It should be detailed to prevent any misunderstanding encountered about the job. An athletic trainer, for example, could have the following job description, under qualifications:

- 1. Educational and professional requirements, level or degree, licensure or certification.
- 2. Level of experience.
- 3. Expertise in a specific area (exercise physiology, curriculum development).

For duties there could be:

- 1. Administering first aid and therapeutic modalities.
- 2. Direct and supervise rehabilitation programs.
- 3. Direct daily training room operations.
- 4. Advise with equipment purchase and supervise equipment fitting.
- 5. Inspection of playing facilities for safety factors.
- 6. Assist with medical examinations and physical fitness screening.
- 7. Training coverage of athletic events, home and away.

A like job description should be used for the team physician, dentist, or any other medical personnel employed by the athletic department. It should detail qualifications educationally and professionally, perhaps the physician is required to be board certified in a medical specialty or belong to specific professional organizations. The responsibility section should indicate coverage requirements and define medical duties:

- 1. Determine medical criteria for participants.
- 2. Diagnosis and treatment of injuries and medical problems.
- 3. Medical supervision of training room operations.
- 4. Overall medical direction of all health and medical aspects of sports.

Operational Section

The operational section is the most extensive part of a procedural manual; it is the substance of this document. It defines the mode of operation in the daily workings of the training room and in handling athletic injuries and health problems. This section can be separated into the following areas:

1. Procedure for the care of injuries and health probelms - this part specifies the methods and steps taken from initial complaint or evaluation and the rendering of first aid through referral to team doctor or dentist and ensuing medical care and treatment (Fig. 2). To define and insure proper channels of medical and legal direction in treatment, it may



be appropriate to institute formal standing orders from the physician to the athletic trainer defining the amount and type of care which may be instituted with or without a physician's involvement. For example, if an athlete sprained an ankle, standing orders would indicate the manner of first aid and followup treatment to be used by the athletic trainer. Such a measure could place the athletic trainer into a position of serving as an agent of the physician in the management of the injury. However, athletic trainers must check into the legality of using standing orders before implimenting them, as in most cases legal statutes vary from state to state.

Also under this section should be the procedure for referring the athlete to specialists or if the athlete requests medical care from a physician not associated with the athletic program. This is important as many insurance policies stipulate that the athlete must be seen initially by the team or institutional physician before going elsewhere or the insurance company will not pay for medical costs incurred. Since the athlete's health status is important at all times, mechanisms for an emergency medical referral system should be arranged to assure the availability of health care to the athlete at all times, especially when the athletic trainer or team physician are unavailable.

- 2. Policy on injury information this applies not only to the media, but also how the coach is appraised of an injured athlete's status. In dealing with the public, proper respect and confidentiality to the athlete should be respected. A designated manner in how, where, and by whom information is given to the press should be set forth indicating the approval of the athlete, coaching and administrative staff. Authorization releases should be employed in transfer of information and records to interested parties, such as colleges in recruiting, and professional teams in scouting and the player draft. A daily injury status form may be used in notifying the coaching staff the status of the injured athlete and the degree of activity the athlete may be able to participate in during practice, such as no activity sweat gear, limited activity, full activity. This avoids questions and misunderstandings as to what the athlete can do.
- 3. Training room management this section covers the day to day operation of the training room and the coverage of services to the athletic program. Among the components of this section are:
 - 1. Manner and availability of dispensing medication.
 - 2. Manner and method of record keeping.
 - 3. Coverage assignments by professional and student staff, what events are covered by whom and hours of operation that the training room is open.
 - 4. Specification on maintenence of facility and equipment.
 - 5. Procedure for obtaining emergency vehicle and medical assistance.
 - 6. The stocking of supplies in the training room and medical kits.
 - 7. Specification as the athlete's conduct in the training room (loitering, attire, handling equipment, requesting supplies).

In some instances to prevent misuse of equipment, standardized procedures for operating the various treatment modalities are also specified. This may be of value in programs where equipment is operated by more than one individual.



Fiscal Policies

An understanding of the financial funding of the athletic training program is essential in operating this service. Knowing the source of funds assists the athletic training in establishing budgets and determining priority in purchasing supplies and equipment.

Each institution or athletic program has a different manner of funding. This manner varies primarily on private or public status. In private or major university programs, funding may be derived from the resources of the intercollegiate athletic program, an entity in itself, and seperate from the instructional area of the institution. In such places, there may exist greater freedom with less administrative control in the purchasing process. On the other hand, public institutions must deal with a bureaucratic channel which proceeds through a maze of levels gathering approval for buying supplies or equipment. In many instances, bidding procedures are required by law for items purchased over a specified dollar amount.

The following points should be included under fiscal policies:

- 1. Position or person authorized to order and purchase supplies and equipment.
- 2. Procedure for purchasing items.
- 3. Source and manner of paying for items not included in budget.
- 4. Inventory procedure and manner of issuing supplies.
- 5. Timetable to be used in preparing a budget and ordering supplies.

The complexities and problems incurred in dealing with athletic insurance warrants that information on this matter also be included in the procedural manual. Athletic insurance coverage varies according to the size, scope, and structure of the athletic program. As a deterrent to any budding problems, all members of the athletic program: coaches, players, and trainers, must have a clear understanding of the insurance policy specifically; limitations, deductions, type of coverage, and manner of filing claims. In many instances athletic insurance covers only injuries or accidents sustained in athletic participation and does not cover illness or a medical condition. Therefore, the athlete must be made aware of this situation and advised to have the necessary health insurance to supplement and cover for any medical costs incurred in such health problems. A special account or the use of a catastrophe insurance policy is usually established by athletic departments for extensive medical costs not covered by the normal policy or a budgeted item.

Conclusion

Periodical revisal of the procedural manual is essential, if the document is to be operational and in compliance with current standards of health care.

With time and research, a procedural manual can be formulated, streamlining the administrative function of an athletic training program. For the most part, most of this information is available, and all that is needed is for the athletic trainer to gather and organize this material.

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- 3. Walker, B. and Muenchen, J.: *Procedural Manual*, University of Cincinnati, 1977

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- 2. Make sure the electrical circuit has a ground fault indicator which will cause the breaker to trip if there be a dangerous current leakage. This leakage can cause a fatal accident without enough of an electrical overload to trip the breaker.
- 3. Have full visability of the hydrotherapy area. If necessary, install a fisheye mirror as in this picture.
- 4. Adequate ventilation is necessary for the overheating of the athletes as well for their comfort. In this case a 36" exhaust fan with a 1 horsepower motor has been installed.

Editor's Note: Anyone wishing to have an idea, technique, etc., considered for this section should send it to Rod Compton, Sports Medicine Division, East Carolina University, Greenville, N.C. 27834. Copy should be typewritten, brief and concise, using high quality photos and/or illustrations.





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guide to contributors

Athletic Training, the Journal of the National Athletic Trainers Association, welcomes the submission of manuscripts which may be of interest to persons engaged in or concerned with the progress of the athletic training profession. The following recommendations are offered to those submitting manuscripts:

- 1. One original and five copies of the manuscript should be forwarded to the editor and each page typewritten on one side of $8^{1/2} \times 11$ inch plain paper, double spaced with one inch margins.
- 2. The first page of the manuscript should include title of paper, full name of author(s), academic degrees, name of the department and institution of author(s).

The second page should contain a brief biographical sketch of each author, suitable for publication with the article. A recent photograph of each author is also requested, but not mandatory.

The text of the article should begin on page three and is to be followed by the bibliography, tables, and illustrations and legends to illustrations in that order.

3. Photographs should be glossy black and white prints unless color is absolutely necessary to indicate detail. Graphs, charts, and figures should be of good quality and clearly presented on white paper with black ink, in a form which will be legible if reduced for publication. Legends to illustrations should be typed separate from the illustrations on a page following the last illustration. Copies of all illustrations should accompany each of the five copies of the manuscript.



- 4. It is the understanding of the editor of Athletic Training that manuscripts submitted will not have been either previously published or simultaneously submitted to another journal. The author accepts responsibility for any major corrections of the manuscript as suggested by the editor.
- 5. For reprints, authors are authorized to reproduce their material for their own use or reprints can be reproduced at time of initial printing if the desired number of reprints is known.
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 - 1. Knight K: Preparation of manuscripts for publication. Athletic Training 11(3):127-129, 1976.
 - 2. Klafs CE, Arnheim DD: Modern Principles of Athletic Training. 4th edition. St. Louis, CV Mosby Co. 1977 p. 61.
 - 3. Albohm M: Common injuries in womens volleyball. Relevant Topics in Athletic Training. Edited by Scriber K, Burke EJ, Ithaca NY: Monument Publications, 1978, pp. 79-81.
 - 4. Behnke R: Licensure for athletic trainers: problems and solutions. Presented at the 29th Annual Meeting and Clinical Symposium of the National Athletic Trainers Association. Las Vega, Nev, June 15, 1978.
- 7. Potential authors are referred to reference 1 above, for help in preparing their manuscripts.
- 8. Unused manuscripts will be returned, when accompanied by a stamped, self-addressed envelope.
- 9. Manuscripts not following the preceeding procedures will be returned to the author.

Address all manuscripts to:

Clint Thompson Department of Athletics Michigan State University East Lansing, Michigan 48824

BOOK REVIEWS

Continued from page 176 patterns.

Correlations between fitness and health are both reinforced and dispelled. Exercise and its relation to academic performance, productivity, working capacity, fatigue, illness and injury is discussed and clarified. Health foods and the diet of the athlete, activity and control of obesity and the hazards of obesity are explained in terms of the physiology of endurance fitness. The use of drugs, tobacco and alcohol and their effect on fitness in general is also discussed.

Dr. Shephard concludes his text by examining the financial considerations of fitness. He examines the direct and indirect cost of ill-health. There is also a comment on the influence of activity and its implications for national policy formation.

This text would serve as an excellent reference in exercise physiology. It is well written and provides pertinent and revealing information not found in many contemporary texts.

Don Kaverman, A.T.,C.

Constitution of the National Athletic Trainers Association

ARTICLE I -- Name

The name of this organization shall be the National Athletic Trainers' Association.

ARTICLE II -- Objectives

The objectives of this association shall be:

- (1) The advancement, encouragement, and improvement of the athletic training profession in all its phases, and to promote a better working relationship among those persons interested in the problems of training.
- (2) To develop further the ability of each of its members.
- (3) To better serve the common interest of its members by providing a means for a free exchange of ideas within the profession.
- (4) To enable members to become better acquainted personally through casual good fellowship.

ARTICLE III -- Membership

Section I

There shall be eight (8) classes of membership as follows:

- (1) Certified
- (2) Associate
- (3) Retired
- (4) Student
- (5) Affiliate
- (6) Advisory
- (7) Allied
- (8) Honorary

and no individual shall be eligible for more than one (1) class of membership at the same time.

Section 2

Qualifications for membership and the rights and obligations of members shall be as indicated in the By-Laws.

ARTICLE IV -- Election of Members

Section 1

Application: Each applicant for any

class of membership shall sign an application stating his desire and intention to become a member of the association, to advance its best interests in every reasonable manner and to accept as binding upon himself its constitution and By-Laws.

Section 2

Membership in the National Athletic Trainers' Association is based on approval of each District's membership committee, the National Athletic Trainers' Association membership committee, in addition to completion of requirements for membership as listed in the By-Laws.

ARTICLE V -- DUES

Section 1

The dues of all classes of members shall be as prescribed by the By-Laws.

ARTICLE VI -- SUSPENSION OF MEMBERSHIP

Section 1

Membership cancellations may be recommended by any member of the association for a cause and the membership of any member be caused to cease by a two-thirds majority vote of those members present at the annual business meeting.

Section 2

A p p e a l s: A p e r s o n w h o s e membership is cancelled in accordance with Section 1 shall be allowed, either in person or through some member of the association, to appeal to the National Membership Committee for reconsideration. Information in the appeal shall be presented to the Board of Directors and the Board shall, by majority vote, decide w hether to submit the question of the membership cancellation to the association membership for another one in accordance with Section 1.

ARTICLE VII -- VOTING POWER

Section 1

Certified and certified retired members shall be entitled to one vote upon all questions submitted to the association for decision.

ARTICLE VIII -- ORGANIZATION

Section 1

National: The governing body of this organization shall be The Board of Directors.

Section 2

Regional: Each District Athletic Trainers' Association will be selfgoverning as per its own specific Constitution and By-Laws. Nothing in a District Consitution and By-laws shall be contrary to the National Constitution and By-laws. In its relations with the National Organization, the District Association will be under the jurisdiction of the National Athletic Trainers' Association Constitution and By-Laws.

- (a) For the purpose of facilitating the work of the National Athletic Trainers' Association the United States and Canada shall be divided into ten (1) geographic areas and each district organization shall have district jurisdiction throughout one of the areas. District area boundaries shall be set by the Board of Directors, and the districts shall be designated and identified by the numbers one (1) through ten (10).
- (b)Each District shall elect a District Director who must be a Certified member of the National Athletic Trainers' Association. Each District Director shall serve as a member of the Board of Directors of the national organization and act with full authority for the district in carrying out the functions and responsibilities of The Board of Directors.



Section 3

(a) President: Elected by a majority popular vote of the voting membership of the National Athletic Trainers' Association. The Board of Directors serves as the nominating committee. The Board will nominate two candidates with biographies of the two candidates published in the Journal prior to the popular vote. Vote shall be by mail. Candidates must have served on the Board of Directors during the past four years.

A ballot shall be mailed to each voting member at his address of record by May 1st and marked ballots shall be sent by mail to the Executive Director by May 15.

The term of office of the President shall be two years and may not serve more than two consecutive terms. The term of office shall begin at the time of the business meeting of the Association at the National meeting following the election.

(b)Vice President: The District Director from one of the ten districts shall be elected to the office of Vice President by the Board of Directors. One or more District Directors may be nominated by the members of the Board and election shall be by majority vote.

The Vice President must be a District Director, also. If the Vice President ceases to be a District Director, a new Vice President must be elected.

The term of office of the Vice-President shall be one year. He may be reelected.

In the event that the office of President becomes vacant before the end of the term for which the President was elected, the Vice-President shall become President immediately and shall serve as President for the remainder of the term or period for which the previous President was elected. In the event that a District (vice president) becomes President, the district which he represented shall select another Director to represent it on the Board of Directors.

The Vice President has no duties except to assume the office of President as prescribed.

Section 4

Removal of Officers: All national officers may be impeached and convicted on the following grounds; embezzlement, malfeasance in office, and actions contrary to or in violation of this Constitution and its By-Laws. Before impeachment proceedings can be instituted, a brief, containing the charges shall be drawn up and presented by a board member to the Board of Directors sitting in executive session. The aforementioned brief must then be adopted by a majority vote prior to the formal presentation of the charges. Impeachment of any officer shall require a two-thirds vote of the voting membership of the Association present at the annual meeting.

ARTICLE IX -- POWERS AND DUTIES OF OFFICERS

Section 1

The officers are the President, Vice-President, Board of Directors and Executive Director.

Section 2

All powers and duties of officers are as prescribed in the By-Laws and Article VIII Section 3 of the constitution.

ARTICLE X -- COMMITTEES

All committees, except the membership committee, shall be appointed by the President with the approval of the Board of Directors.

ARTICLE XI -- MEETINGS

Section 1

The annual business meeting shall be held each year at a time and place set by the Board of Directors.

A quorum for the annual meeting shall consist of one-fifth of the voting membership of the Association, excluding Certified Retired members in figuring the one-fifth.

Section2

The Board of Directors may submit items of association business to the voting membership for a vote by mail. Approval of items so submitted shall require a "yes" majority of a respondence of at least one-fifth of the voting membership of the association.

Section 3

The Board of Directors shall meet at the National Convention and at any other time that the President determines it necessary to call a Board meeting.

A quorum for a Board of Directors meeting shall be six (6).

The President may submit appropriate items of association business to the Board of Directors for a vote by mail. For such a voting procedure the President shall first secure a "second" to the proposal and then submit the proposal to each member of the Board by mail with a request to mail a "yes" or "no" vote on the proposal by a definite date not sooner than ten (10) days after the mailing of the proposal. Board approval of items submitted shall require a "yes" vote of at least six members of the Board.

The President may submit emergency items of Association business that are appropriate for Board action to the Board of Directors for a vote by telephone. For such a voting procedure the President shall first secure a "second" to the proposal and then call each member of the Board for his vote on the proposal. Board approval of items so submitted shall require a "yes" vote by at least six members of the Board.

ARTICLE XII -- AMENDMENTS TO THE CONSTITUTION

Section 1

All proposed amendments to the constitution shall be submitted in writing to the Executive Director at least six weeks prior to the annual business meeting. The Executive Director shall distribute copies of the proposal to all voting members at least three weeks prior to the annual business meeting.

Section 2

A proposed amendment to the constitution that has been properly submitted shall be read at the annual business meeting and a two-third (2/3) majority vote of the voting membership present shall be necessary for the adoption of the said amendment.

ARTICLE XIII -- AMENDMENTS TO THE BY-LAWS

The By-Laws may be amended at any official meeting of the Board of Directors by a majority vote.

By-Laws may not be added, deleted or amended by a vote by mail or telephone.





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