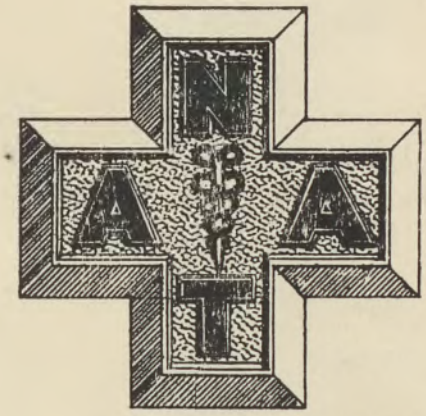
The JOURNAL

OCTOBER 1957

OF THE

NATIONAL ATHLETIC TRAINERS ASSOCIATION



9th ANNUAL MEETING, MIAMI BEACH, FLORIDA

EXERCISES FOR SHOULDER DISLOCATIONS*

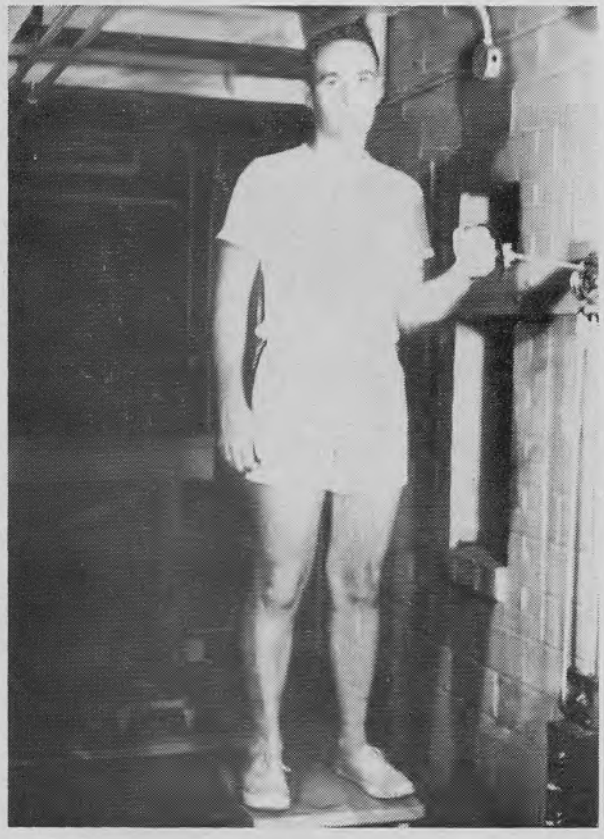
Frank D. Sills

One of the most common joint injuries encountered in athletics is a dislocated shoulder. A shoulder dislocation is also common to many non-athletes who sustain such injury by falls. Once a shoulder has been dislocated, the trauma that occurs is such that a recurrence of the injury is quite likely. The majority of persons afflicted have numerous dislocations, and it is not uncommon to find persons who have considerable difficulty in keeping the humerus in its proper position for a week to ten days.

In view of the frequency of this type of injury, and the fact that it is quite debilitating, a study was initiated three years ago to determine whether or not these dislocations may be prevented by exercise. In conjunction with work being done by Dr. Robert Newman of the Orthopedic Department at the State University of Iowa Hospitals, it has been possible to have numerous persons examined, and to place these people on exercise programs. The effect of these exercise programs have been evaluated and the results have been very good.

When a person with a shoulder dislocation is first examined, Dr. Newman determines whether or not the particular injury may or may not be subject to correction by means of exercises. In every case where it would seem advisable to attempt the exercise program, Dr. Newman makes this recommendation. The subject is then examined to determine the strength of the inward rotators and adductors of the humerus. Following the medical examination, to determine the extent of the trauma, and the anthropometric examination to determine the strength of the muscle groups involved, the subject is placed upon a program of resistance exercises. These exercises are given three times each week and emphasis is placed on (1) inward rotation of the humerus, and (2) adduction of the humerus.

The kind of program that is followed does not provide for numerous repetitions, and is based upon the theory that to develop muscle strength in a short perio dof time it is best to use heavy resistance. The subject is given four or five minutes of non-resistive exercises as a "warmup." The warmup exercises may be eliminated at the discretion of the instructor. The subject then performs the inward rotation movements of the humerus using heavy resistance, followed by ten adduction movements of the humerus. This procedure is repeated two more times. The subject may reach a point where he can perform only five or six movements the third time that he attempts either one of the exercises, however, no effort is made to reduce the load in order that more repetitions may be performed. The major gains made in the strength of the involved muscle groups occur during the first three or four weeks of the program of exercises. After this the gains do not occur as rapidly,



(Continued on Page 3)

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NATIONAL SECRETARY
WILLIAM NEWELL — Purdue University
West Lafayette, Indiana

PUBLIC RELATIONS CHAIRMAN
Cambridge City Schools
Cambridge, Massachusetts

BOOK REVIEW

BODY DYNAMICS, Metheny, Eleanor, Cloth, 220 pp., McGraw-Hill, New York City, $4.50

This very readable book was prepared to give the average person an insight into the application of sound scientific principles of efficient body use to everyday living. In her own words, the book "deals with the problems of fitness in terms of the efficient expenditure of human energy to produce maximum results with minimum effort."

The book contains information on basic body structures, relaxation, the uses of exercise and balanced posture for standing, sitting and work activities. The appendix contains an excellent selected list of exercises. The illustrations are effective, and while often utilizing the female figure, are representative of mechanical principles equally applicable to all human beings.

Throughout the entire book, Dr. Metheny develops her concept of constructive rather than destructive utilization of energy. The material in the book has been developed from years of work with elementary, secondary and adult groups, including her "Body Mechanics Workshop' which is as popular with men as with women.

The athletic trainer will find in this book new approaches and practical applications of kinesiology and body mechanics which ars as scientifically sound for the athlete as for the tired business man or his secretary.

D. F. Gillanders, Ed. D.
Arizona State

PERIODICAL LITERATURE OF INTEREST

Bauer, Albert W., "Ultrasonic Research Progress During the Past Three Years," **British Journal of Physical Medicine**, 30:151-58, July, 1957.

Cicerica, Erbert F., and Morton Hoberman, "Braces and Brace Management," **American Journal of Physical Medicine**, 36:136-52, June, 1957.

Ford, Dorthy E., and Edward M. Krusen, Jr., "Conservative Management of Certain Types of Back Injury: Analysis of Results," **Archives of Physical Medicine**, 38:395-401, June, 1957.

Gonet, C. L. C., "Tennis Elbow, A New Conception." **Annals of Physical Medicine**, 4:70-73, May, 1957.

Hunsicker, Paul, and George Greey, "Studies in Human Strength," **Research Quarterly**, 28:109-21, May, 1957.

Kolb, Mary E., "Principles of Underwater Exercise," **Physical Therapy Review**, 37:361-65, June, 1957.

Lee, Harold G., "Surgical Repair in Recurrent Dislocation of the Ankle Joint," **Journal of Bone and Joint Surgery**, 39-A: 828-34, July, 1957.

McCloy, C. H., "Exercises to Increase Flexibility," **Journal of the Association for Physical and Mental Rehabilitation**, 11:91-, May-June, 1957.

Nyquist, Roy, and others, "Horizontal 'Leg Press' Exercises," **Archives of Physical Medicine**, 38:454-55, July, 1957.

O'Donoghue, Don H. "Impingement Exostoses of the Talus and Tibia," **Journal of Bone and Joint Surgery**, 39-A: 835-57, July, 1957.

EXERCISES—

(Continued from Page 1)

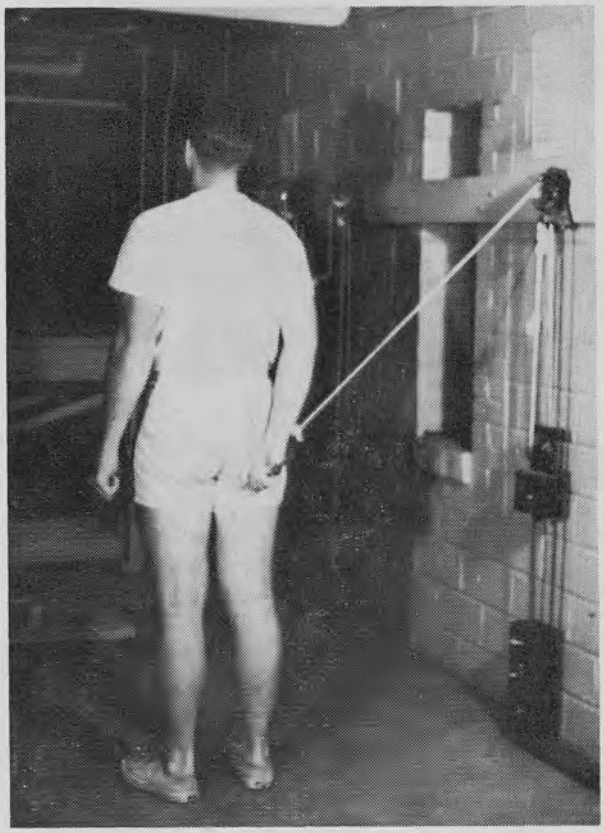
but continue at a slower rate for an extended period of time if the subject continues exercising. To gain maximum benefit it seems advisable, at the present time, to continue the exercises for a minimum of twelve weeks.

The results of this program have been very encouraging. The majority of subjects who participate in the program have responded favorably. At the present time there are more than fifteen persons who have participated in this activity, and in only one or two instances have recurrent dislocations occurred. In these cases, the recurrent dislocation have been infrequent as compared to the number prior to treatment by exercise.

order that the shoulder would be better protected against future accidents. These supplementary exercises should not be given to the subject immediately, but should be worked into the program gradually, after the subject has put in a minimum of six weeks on the internal rotation.

Diagrams of the exercises for preventing shoulder dislocations have been included here. The one diagram shows the subject performing the movement to develop strength of the inward rotators of the humerous, and the second diagram shows the subject performing an exercise which will strengthen the adductors of the humerous. It is very important that these two exercises be performed properly.

If the subject elevates his arm too high, or if he rotates it outwardly too far, he may dislocate his shoulder, or cause



In addition to the two exercises that have been specifically designed to hold the head of the humerous in the glenoid fossa, a complete program of upper body development should be instigated. The kinds of exercise which will prove most beneficial include such thing as: pull overs and lateral raises from a supine position, forward raises and lateral raises from a standing position, forearm curls, and the military press in the standing position. A bench press from a supine position may be used if the instructor would prefer this type of movement. The idea of these supplementary exercises is to build up the general musculature in trauma that will force him to discontinue the exercises for some period of time. During the early stages of the exercise program the subject should be encouraged to keep his arm down, and not to elevate it or use any flinging movements. When these precautions are taken and the exercises are properly performed, there is little doubt that the subject will respond favorably to the program which has been described in this paper.

*From the Physical Education Laboratory and the Department of Orthopedics, State University of Iowa.

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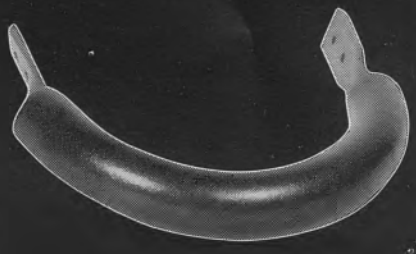

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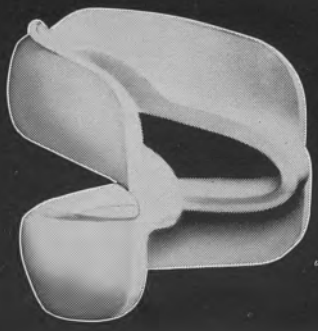

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HEATEX IN ATHLETIC HEAT EXHAUSTION

Eddie Wojecki, Head Trainer
Athletic Department
Rice Institute, Houston, Texas

All trainers and coaches in the Southwest, particularly in the Gulf Coast area, have a close and moist memory of our climate. It is possible that here the problem of athletic heat exhaustion is most acute.

Heat exhaustion should be distinguished at the outset from heat-stroke. The latter is an acute condition, seldom encountered in collegiate athletics, characterized by cessation of sweating, patient is flushed, skin hot and dry — all precisely opposite to the symptons of heat exhaustion. This condition is a serious threat to life.

Heat exhaustion or heat fatigue is complex and difficult to define precisely. According to Taber's Syclopedic Medical Dictionary, it "usually affects adults, especially the debilitated and fatigued. Symptoms: Dizziness, faintness, nausea, weakness. Unconsciousness often follows. Skin pale, cool, moist, pulse rapid, respiration shallow and hurried." The Merck Manual adds that heat exhaustion or prostration "results from failure of the peripheral circulatory system" and "the victim is listless, apprehensive . . . mild muscular cramps may precede the attack." Profuse sweating is a part of heat exhaustion.

In a groad sense, heat exhaustion implies a diminished capacity for work or performance. Tiredness or weariness is not always characteristic in athletes suffering from heat exhaustion in our experience. Actually, we have taken primarily to watching for time of recovery or "bounce back" after exertion. How does the suspected athlete approach the next workout? Is his zip gone? Is he not working as hard as formerly for that starting berth, that record? Our experience with athletic heat exhaustion leads us to the conclusion that most of our cases are, to use a medical phrase, sub-clinical or, in other words, not easily recognized nor classified by means of standard symptoms.

We seldom have occasion to fret about the lad who glories in the amount of sweat that has poured from him; he looks upon it as evidence of a trimming down, hardening, speeding up program essential for achieving his goal. The suspect usually has some worries about how much vitality was removed by sweating how much strength was lost, and he longs for a chilly air-conditioned room like the chubby football player on a diet longs for a slab of chocolate cake.

We also believe that many of our cases in the past have been cumulative, the exhaustion building up by degrees over a number of days or even weeks. Watch carefully the man who states he has not slept well for several nights. You may well have a heat exhaustion case building up. In a ten year study of industrial heat exhaustion by the DuPont Company at their Richmond, Virginia plant, they found the cumulative factor a great one in that heat exhaustion led to sleeplessness which in turn increased the fatigue. This vicious circle was earlier reported from England and it was there concluded that fatigue often becomes both the cause and the effect of ill health.

Football is our largest problem. The weather is usually mighty warm, the humidity high, the sun brilliant, the equipment heavy and the competition for positions particularly keen, with success often based on a number of opinions, rather than specific performance as manifested by times or distances. Basketball, while played under more consistently favorable weather conditions, does involve a continuous running and body temperatures do mount. Note also again here, that starting jobs depend on opinions and uncertainties do creep in; insecurity is probably an occasional factor. Distance runners and some baseball players also come in for our close scrutiny with regard to heat exhaustion. Members of these squads should be checked regularly with regard to sleeping habits. Do you sleep soundly or do you toss and turn?

It would be just fine if we had a specific diagnostic check-off list for heat exhaustion — we don't have such a helpful aid. We keep an eye on the temperature, the sun, the humidity, the length of the workout and the number of rest periods which are most helpful even though short. We check players' weight, appetite, sleep, pulse rate and occasionally body temperature by the thermometer after a prolonged workout. We look for mental weariness as evidenced by dull play or indifferent attitude and we, as trainers, encourage each of them and never discourage, watching carefully their attitude toward recovery from any injury.

Let us examine some of the medical background on heat exhaustion and its prophylactic treatment, bearing in mind that the average general practitioner, not a team physician, is not likely to encounter frequently this type of stress. As an aid, however, we do have a number of Houston physicians report numerous cases of heat exhaustion in their practice.

The main physiological point of interest insofar as heat exhaustion is concerned has for years been elecrolyte balance. Preventive medicine has believed that replacement of chlorides lost in perspiration was the main preventive measure. Sodium and potassium levels were regarded with interest. Attempts to associate fatigue with measurable changes in body tissue and accumulation of specific fatigue substances have not been too successful.

Treatment according to Saunders **Current Therapy**, 1952, consists of "removal to a cool place in a reclining position, elevation and massage of legs. If patient is dehydrated, fluids should be given by mouth with some added saline . . . If the patient is not suffering from any chronic disease, he may be allowed back to work the following day." The Merck Manual states "cool water containing sodium chloride may be given orally."

In 1950 two physicians concluded a ten year study at the DuPont, Richmond, Virginia, plant, referred to earlier. The two men were W. L. Weaver, M. D. and B. E. Field, M. D. They used ascorbic acid (Vitamin C) and summarized as follows . . . "it was found that heat exhaustion did not occur in a group of men given ascorbic acid when exposed to high temperatures, whereas it occurred in a control (non-treated) group with less rigorous exposure. Heat exhaustion cases disappeared in the control group after ascorbic acid was given following the end of the test period . . . it is thought that ascorbic acid acts by partially protecting the body against over-adaptation to stress." These men reviewed the literature, pointing out successes with ascorbic acid at

the Haskell Laboratory of Industrial Toxicology, by Savage and Finch in industry, by Horsley in the Army, who reported an 80% reduction of heat exhaustion by use of ascorbic acid.

The role of salt or sodium chloride in dehydration is succintly reviewed by Dr. Eeverett in his **Medical Biochemistry** under Dehydration. He states "A sodium chloride deficiency is produced by excessive perspiration . . . about one-fifth of the daily water excretion occurs as insensible perspiration of the skin, and another one-eighth as sweat (32%) . . . at sufficiently high environmental temperatures and humidities, it can exceed 10 liters per day . . . when sweating is inadequate, the body temperature rises and heat stroke can occur."

So what have we? The necessity for profuse sweating with exertion in warm weather while losing the various minerals required by the cells. Also we have a defense mechanism of the body, triggered by the stress of heat and loss of body fluid including blood volume, which defense mechanism is violent and often over-zealous. Lastly we have a great diminution of energy.

At our school we have had complete success with the tablet Heatex. This tablet contains: salt 5 grains, in the new form of trace elements sea salt; ascorbic acid 100 mg; dextrose for quick energy, 3 grains. This tablet is placed in the training room and each athlete helps himself to one pre-practice, one post-practice and takes one tablet for use the following morning — three a day is our recommendation. Last Fall (1956), we started this program after the end of the first day of practice. That first afternoon we had three cases of frank heat exhaustion. Treatment with Heatex was then initiated and to date of writing, we have not had any more such cases and we submit this fact as rather significant. Bear in mind that we had much hot weather and strenuous practice for more than ten weeks, not to mention spring practice this year — all without any evidence of fatigue attributable to heat. Basketball, track and baseball squads were likewise unaffected by the heat.

In summary, we believe in the wisdom of sea salt which contains the thirty-nine trace elements found in uman perspiration and sera in the same proportions that they are there found; we believe that ascorbic acid, 300 to 500 milligrams a day, will protect the body against over-adaptation to stress, as in heat exhaustion; and we believe that dextrose will provide a primary source of energy when greatly needed, as in heat exhaustion. The combination appears to be a most effective one.

THE SECRETARY'S REPORT

Eighth Annual Meeting of
National Athletic Trainers Association
18 June, 1957

The eighth annual meeting of the National Athletic Trainers Association was held in the ballroom of the Cornhusker Hotel at Lincoln, Nebraska. The meeting was called to order at 1:20 p.m. by Chairman of the Board, Duke Wyre.

The roll call was dispensed with.

The minutes of the 1956 meeting at Boston, Massachusetts were read by the secretary, Pinky Newell. It was moved and seconded to accept them as read; it carried unanimously.

The treasurer's report was read along with a certified statement from the Purdue National Bank of Layfayette. It was moved and seconded that the report be accepted which was approved.

NATA Treasurer's Report

June 13, 1957		
Balance on hand June 1957		$1,942.14
Deposits:		
Dues	$984.00	
Sale of Pins and Emblems	41.00	
Balance of '56 Picnic Fund	605.00	
'56 Registration Fees	284.00	
Journal Advertisements	432.49	2,346.49
Disbursements:		
Layfayette Mailing Service	276.11	
Secretarial Work	755.00	
Postage	44.00	
Stationary, Membership cards, Certificates, etc.	148.05	
Four Honor Award Certificates	20.00	
Three issues of Journal	717.25	
Dues returns	23.00	1,983.41
Balance on Hand June 1957		2,305.22
Checks not canceled		100.00
Certified statement from Bank		2,405.22

Membership June 1957

Active	341
Associate	163
Allied	36
Advisory	49
Honorary	3
Total Membership	589

The secretary read the report of the Chairman of the Board of Directors. At the Board of Directors' Meeting, these actions were decided:

1. The following committees were appointed or renewed:

HONORARY MEMBERSHIPS AND AWARDS

Walter Bakke, Chairman, University of Wisconsin; E. W. Pennock, Springfield College; Julius Reichel, Syracuse University; A. C. "Whitey" Gwynne, West Virginia University; Ollie DeVictor, University of Missouri; Wayne Rudy, Southern Methodist University; Naseby Rhinehart, University of Montana; Bob Peterson, University of California; Joe Worden, Vanderbilt University.

MEMBERSHIP COMMITTEE

Elmer Brown, Chairman, Texas Christian University; Kenny Howard, Alabama Polytechnic Institute; Mel Moretti; College of Pacific; Dean Nesmith, University of Kansas; Joe Stanitis, Amherst College.

TWENTY-FIVE YEAR AWARD

Lawrence Morgan, Chairman, Kansas State College; James Hunt, University of Michigan; Ernie Biggs, Ohio State University; Dave Wike, University of Miami.

CODE OF ETHICS COMMITTEE

Howard Waite, Chairman, University of Pittsburgh; Stephen Witkowski, Wesleyan University; Martin Broussard, Louisiana State University; Jack Williamson, University of California; Robert Brashear, MD, Advisory.

PUBLICITY

Publicity will again be handled through the districts with Bill Linskey acting as Publicity Director.

2. Certificates will be re-issued to all members with the 1958 dues payment. Thereafter, only membership cards will be issued to renewals. In case a member requests a new certificate, he will receive a duplicate. This is to do away with the Gold Seals as used in the past two years.

3. All districts will be encouraged to bring their constitutions into line with the national . . . particularly the Article on Memberships.

4. The staff of the "Journal of the National Athletic Trainers Association" is now composed of the following three men:

Art Dickinson, Jr.' Editor
Bill Linksey, Publicity and Public Relations
Tom Healion, Advertising Manager

5. Elected to the Constitution and By-Laws Committee for the following years are:

Chuck Medlar, three years.
Buck Andel, two years.
Ken Rawlinson, one year.

At the end of each year a replacement will be appointed for a three year term.

6. Chuck Cramer was reappointed Ex-Officio member of the Board of Directors.

7. The chairman requested that a statement be prepared concerning the unethical procedure as defined by the Code of Ethics and that this be published by one of the wire services.

8. Three sites were taken under consideration for 1958.

Oxford, Ohio — presented by Jay Colville.
Miami Beach, Florida — presented by Sam Lankford.
Columbus, Ohio — presented by Ernie Biggs.

Miami Beach, Florida will be the site for the 1958 annual meetings with District No. 9 acting as hosts. Sam Lankford will be program chairman. June 15, 16, 17 was set as the dates. Colorado Springs was selected as the site for the 1959 annual meetings with District No. 7 acting as host.

An insurance plan was discussed and the chairman was instructed to invite the carrier of the plan to speak to the floor of the national business meeting.

9. District No. 8 asked that the Board consider a new injury report. They were instructed to file their recommendations with the chairman of the injury committee.

10. Bill Newell was re-elected as National Secretary.

11. Districts are to be charged with the responsibility of acting on members declared delinquent in dues by the association.

The report was moved for approval, seconded, and carried.

Committee Reports:

Honorary Membership Awards

Walter Bakke, Chairman presented to S. E. Bilik, MD honorary membership and an honor award for outstanding service to the Athletic Training Profession. This action was

received with a standing ovation.

Twenty-Five Year Award

Porky Morgan, Chairman, announced that the following men were eligible for the twenty-five year award:

JOHN KAMMER

1929-30	Freeport High School
1929-30	Dubuque MVL
1930	Loras College
1931-57	Loras College (Permanent Appointment)

RUDY SCHNEIDER

1931	Yale University

JOSEPH KEARNS

1927	Yale University

FRANK FOLEY

1918-28	Leo Flynn
1928-38	Elm City Gymn
1938-45	New York University
1945	Yale University

STEVE WITKOWSKI

1932-57	Wesleyan University

ARTHUR DICKINSON

1919-24	Washington and Marshalltown High Schools
1924-56	Iowa State Teachers College

RICHARD COLE

1932-40	Brown University
1924-56	Rhode Island University

Code of Ethics

Howard Waite, Chairman, reported the re-wording of one sentence:

It is further suggested that any report of unethical conduct be sent directly to the Chairman of the Board of Directors.

AMENDMENT

It is further suggested that a written report of any unethical conduct be sent directly to the Chairman of the Board of Directors.

Injuries Committee

Future work to be as read in the minutes of the Board of Directors Meeting.

Constitution and By-Laws

Chuck Medlar, Chairman, advised of future work concerning the revision of the By-Laws to be presented at the next annual meeting.

It was moved that the reports of the committees be accepted. This was seconded and carried.

It was moved that the Code of Ethics be approved as amended. This was seconde, and unanimously carried.

Bill Linskey received permission to read to the floor a release to be given to the wire services showing by the Code of Ethics, the association's views of unethical practices.

This was greeted with a unanimously spontaneous ovation.

Duke Wyre read a letter to the floor from Walter Byers, Executive Secretary of the National Collegiate Athletic Association, of the election of NATA to an affiliate membership in the NCAA.

Art Dickinson, Jr. was given a fine han dfor his work as Editor of the "Journal." The chairman asked that each district take the responsibility of keeping the ojurnal staff supplied with articles.

The athletic trainers with the United States Olympic teams in Australia, were congratulated for their contributions to world peace by Duke Wyre.

The chair thanked the many companies exhibiting and congratulated them for a job well done.

Mr. William R. Link Lyman presen ed to the floor, an insurance plan to be known as the Nation Athletic Trainers Association Life Insurance Plan. It was moved and seconded to adopt this plan. This is to be a service to the membership. The secretary was instructed to send a letter of approval to Mr. Lyman.

Duke Wyre presented the new Board of Directors:

District No. 1, Bill Dayton, Yale University

District No. 2, Chuck Medlar, Penn State University

District No. 3, Warren Ariail, Wake Forest College

District No. 4, Jim Hunt, University of Michigan

District No. 5, Fred Wappel, University of Missouri

District No. 6, Ross Moore, Texas Western College

District No. 7, Jim Conboy, US Air Force Academy

District No. 8, Bob Officer, University of Oregon

District No. 9, Marty Broussard, Louisiana State University

Jim Hunt, University of Michigan was presented as the new chairman of the Board of Directors.

Paul Schneider was given a standing ovation for his direction of the 1957 program.

The meeting was adjourned at 2:30 p.m.

WILLIAM "PINKY" NEWELL
William "Pinky" Newell
National Secretary

TO ALL ACTIVE MEMBERS OR ASSOCIATE N.A.T.A. MEMBERS

Here is the emblem officially adopted by your Association at the 1952 Convention.

It is available in two ways:

Gold pin, 9/16" wide - - - - -	$2.50
Cloth patch, 3" wide - - - - -	$1.00

These are in colors and will dignify your coat lapel, or uniforms.

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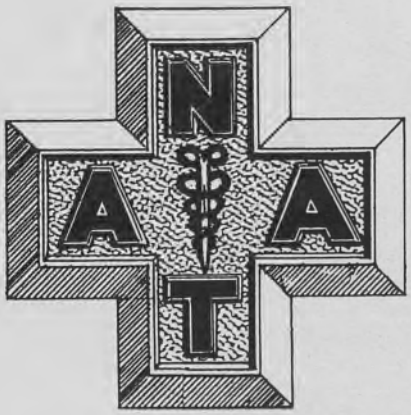

PROGRAM NOTES

NATIONAL ATHLETIC TRAINERS ASSOCIATION

Eighth Annual Meeting
JUNE 17, 1957
9:00

June 17-18, 1957
Cornhusker Hotel
Lincoln, Nebraska

A very warm welcome was extended to the Athletic Trainers by the Governor of Nebraska, **The Honorable Victor Anderson.**

Duke Wyre, Head Trainer of Maryland University, National Chairman of N. A. T. A. added his welcome to the members and turned the program over to Paul Schneider, University of Nebraska, Program Chairman.

9:30

Ankle and Knee Injuries and Repair

Fred Webster, M.D., Orthopedic Surgeon of Lincoln, Nebraska, gave a very interesting lecture on the ankle; the major portion of his talk centered around spurring of the anterior border of the distal end of the tibia and spurring found on the adjacent talus bone.

A. **Spurring along anterior border of the tibia:** Dr. Webster remarked that this was a relatively new finding in relation to ankle pain and malfunction. Reports are present in the British literature concerning this entity found in soccor athletes, and Dr. Webster went on to say that Dr. O'Donaghue, M.D., of Oklahoma City, Oklahoma, had given an earlier report on spurring. Dr. Webster selected 60 athletes at the University of Nebraska and 60 students (non-athletes) and conducted x-ray studies of their ankles. These people had complained of ankle pain. Findings showed over 50%, or 32, of the athletes displayed this entity; and a very low percentage of the non-athletes, eight, demonstrated spurring. The conclusions drawn are:

1) Absence of clinical signs of ankle difficulty other than pain is not to be taken lightly.

2) X-rays are always indicated in stubborn or sub-acute ankle problems when clinical evidence is lacking.

3) The problem is strictly mechanical, and from this one can see why dorsi-flexion or rather full dorsi-flexion can cause pain in pushing off or when the running athlete really goes "all out."

4) It may be a carry-over from a high school injury.

5) Treatment can be handled conservatively or surgically. Dr. Webster commented that hydrocortone can be used conservatively, but more often surgical intervention is necessary. Several very fine slides were shown throughout Dr. Webster's talk, many of which demonstrated the spur from x-ray findings. Also, many fine color slides taken in the operating room dramatically showed the surgical findings. Surgical intervention proved most satisfactory in these cases with no post-operative problem for the athlete.

6) Spurring of the anterior border of the tibia at the distal termination of the bone and adjacent tarsal bone (talus) can be a fairly common finding in sub-acute or chronic ankle trauma. Perhaps spurring in this area is an "occupational hazard" of the athlete, fairly uncommon to the non-participant.

B. **Sprain of the ankle:** Dr. Webster emphasized proper handling, the use of ice, elevation, and compression bandage (evenness of compression bandage very important). X-ray, of course, was stressed with the ankle in inversion and perhaps the use of hyaluronidase or other enzymes at discretion of the team physician.

C. **Posterior Injury to Talus Tubercle:** Not too common but can occur. The eubercle will avulse a little as demonstrated on the x-ray film. Dr. Webster noted that sometimes flexion of the great toe against resistance can cause pain at this local site because of the tendon of the flexor hallacus longus passing in close proximity to the talus tubercle as it goes behind the medial malleolus. Dr. Webster presented a slide showing involvement of the talus tubercle. I thought his comments significant because we could possibly be thinking in terms of Achilles tendon involvement, and it **may not be that at all.**

Following Dr. Webster, Donald H. O'Donaghue, M.D., Orthopedic Surgeon, Oklahoma City, Oklahoma, gave a very interesting talk on the knee. Following are notes taken on Dr. O'Donaghue's presentation.

A. **Knee Injury:** Dr. O'Donaghue analyzed the knee beautifully with his challenge to the Athletic Trainer concerning observation.

1) Severity of the injury?
2) Degree of disability?
3) Abnormal motion? (in extension)
4) Location of tenderness.
5) Amount and **rapidity** of swelling:
(a) Fast — indicative of blood.
(b) Slow — synovial fluid.
6) Restriction or pain on normal motion.
7) Locking?

B. **Severity of Knee Injuries:**

1) **Mild** — some fibers of ligament damaged; no real loss of strength; no real weakening of the ligament.

2) **Moderate** — a definite tear in the ligament, loss of strength.

3) **Severe** — complete tear of ligaments, complete loss of the integrity of the joint.

C. **Mild Knee Sprain**

1) **Symptoms:**

Positive:

a) Tender at site of tear.
b) Pain on abnormal stress.
c) Local swelling (knee shouldn't swell up with blood)
d) Pain on forced motion.

Negative:

a) No instability.
b) No blood in joint.
c) No effusion.
d) No locking.
e) No pain in normal motion.

2) **Treatment:**

a) Rest (remove from game).
b) Cold — then heat.
c) Protection — strapping.
d) Injection — local hyaluronidase, hydrocortone, procaine, etc. (**If** injected, no participation for 24 hours.)
e) Early active motion.
f) No immobilization.

D. **Moderate Knee Sprain:**

1) **Symptoms:**

a) **Pain** in the knee.
b) Local tenderness.
c) Disability.
d) Swelling.
e) Fluid in the joint.
f) Pain on stress.
g) Locking (?)

Negative:

a) No abnormal motion.

2) **Treatment:**

a) Rest.

b) Cold — then heat.

c) Aspiration of joint — Dr. Donaghue advocates continued aspiration of the joint when indicated to avoid capsule stretching and distention.

d) Injection — important; **but** if symptoms are relieved by novacaine, nature's warning system, pain, is thrown out of order.

e) Protection — splint, plaster cast, adhesive strapping.

f) Rehabilitation — Dr. O'Donaghue advocates immediate quadriceps setting exercises **bilaterally.** (Some recent research seems to indicate the good quad. will help the quad. on the injured side respond more readily to exercise; therefore, bilateral quad. setting exercise is indicated.)

E. **Severe Knee Injuries:**

1) **Symptoms:**

a) Immediate disability, severe; knee gives way on walking, for example.

b) atient **states** knee "gives away."

c) Severe pain.

d) Abnormal motion — lateral, anterior and posterior, rotatory. (**Compare** with other knee.)

e) Blood in joint.

f) Blood infiltration up and down leg.

g) Swelling.

h) Locking.

i) X-ray findings (?)

2) **Treatment:**

a) **Non-surgical:**

1/ Rest — pressure dressing.

2/ Cold — then heat.

3/ Aspirate joint.

4/ rotection — in cast (8 weeks), splints, adhesive support.

5/ Rehabilitation.

b) **Surgical intervention:**

1/ Prompt decision (within 24 hours).

2/ Early repair.

3/ **Complete** repair of **all** ligaments torn (so boy can partisipate again).

4/ Repair, not reconstruction.

Note: In complete ligament tears, a better result is achieved if done quickly and is found to be much more desirable. An injury of lesser degree operated at a later date does not seem to display the same good results of a fresh repair.

10:45

Open Forum on Knee and Ankle Injuries

Donald H. O'Donaghue, M.D.

Fred Webster, M.D.

Frank Stone, M.D., Orthopedic Surgeon, Lincoln, Neb.

Paul Geotowski, M.D., Orthopedic Surgeon, Lincoln, Neb.

There were many excellent questions asked by N.A.T.A. members. The writer did not write down all questions and answers because of the rapidity of the panel discussion. However, a few were recorded and follow.

Q. 1. Did Dr. Webster feel **low cut** shoes played a part in spur formation?

A. He did not know, nor did he care to comment either way. He did feel it may be a good point for investigation.

Q. 2. The panel was asked how long after cartilage removal could high school boys return to "full go."

A. The concensus was of course it depends on the extent of injury and the boy, but in general it was felt regardless of date of injury (Ex. — Sept. 1 or 2) the boy was **out** for the season. If received in the spring, he **might** be ready by fall.

Q. 3. Dr. Geotowski (a former football player) was asked what improvements he had seen in equipment in modern day football and what improvements he would like to see.

A. Dr. Geotowski felt that head and shoulder equipment had come a **long way;** when "pinned down," he commented that **foot gear** was the present piece of equipment he would like to see improved the most.

Q. 4. The panel was asked "how long" is cold applied?

A. The consensus was two to three hours and even much longer at the discretion of the team physician.

2:00

Dangers of Nerve and Head Injuries in Athletics

Dr. Louis J. Gogela, M.D.

Neurological Surgeon, Lincoln, Nebraska.

Dr. Gogela gave an excellent presentation eagerly received by the members. Slides were shown during his talk emphasizing the emergency that can arise following a blow to the head.

A. **Concussion** — nothing more than loss of consciousness due to temporary cessation of the physiological (function) aspect of the brain.

B. **Contusion** — bruise of the brain.

C. **Laceration** — actual tearing or laceration of the brain.

Dr. Gogela commented on: How serious is the head injury on the field? You **cannot** tell at first impression. Watch out for the individual who is stunned momentarily and recovers, then later (perhaps 15 to 30 minutes) is stunned and dazed again. This can be a serious injury and immediate medical counsel is indicated. When the boy is down on the field, you do not necessarily have to raise his head. Stimulants can be used, **but** the boy will awaken when it is physiologically the right time for him to do so. Dr. Gogela emphasized **not** to put a boy back in a game once he has been rendered unconscious.

Dizziness and headaches are very common a great deal of the time (weeks and months) following a head injury. Best to have these boys checked by the team physician.

D. **Spinal Cord Injuries:**

1) As a rule spinal cord injuries are more serious and disabling than minor brain damage.

2) How do you suspect spinal cord damage?

a) Is back pain present?

b) Can the boy move his fingers and toes? Have him squeeze your hand; ask him to wiggle his toes.

c) Is numbness present anywhere? If back pain is present, presume he has a spinal cord injury and send to a physician in the proper manner — **never** raise the boy to his feet; **never** attempt a manipulative procedure of the spinal column after an injury.

Dr. Gogela had a few brief comments about nerve injury. They are of the pulled or stretched variety. Adequate protective, of course, is protective gear; and treatment is physical therapy and splinting as directed.

2:40

Internal Injuries in Athletics

Jon T. Williams, M.D.

Lincoln, Nebraska.

Dr. Williams' presentation was most interesting to the members and prompted many questions in the panel that followed. Following is some of Dr. Williams' presentation.

Dear Trainer:

Here is our most recent and possibly our most unusual aerosol spray. We feel that it fits in to your program because of its ability to relieve the symptoms of the common cold.

It can be used as a home vaporizer. It replaces the "home cooker" and in five seconds will prepare the bed room for relaxed sleep. It may also be sprayed on a handkerchief or pillow or used in a "stale" halftime room five minutes before the team comes in.

Show it to your team physician!

A. **Thorax:**

Fracture of the Rib: Painful but not serious unless the pleura or lung itself is punctured resulting in colections of blood in the pleural cavity or in the lung (which can reseult in lung collapse). Also, collections of blood can occur between the lobes of the lungs. These last stated entities can result in coughing of blood and require hospitalization.

B. **Abdominal:**

1. **Rupture of the Spleen:** Severe pain under the ribs on the left; may clear all most entirely; **BUT** suddenly in a matter of hours the patient can become white and pass out. The reason for this is that the bleeding occurred under the spleen capsule and finally the capsule of the spleen ruptured, resulting in extensive bleeding. This is a surgical emergency.

2. **Infectious Mononucleosis:** Is a benign disease. As a rule patients recover with no complications. **But** complications can result — hepatitis, jaundice.

Symptoms:

a) Fatigue (feel draggy).

b) Enlargement of lymph nodes along posterior cervical region, axilla, and groin. When these appear **and if** a boy is playing contact sports, spleen rupture is a possibility because the disease makes the spleen soft.

3. **Rupture of Abdominal Organs:**

a) Severe pain!

b) Most are obvious!

c) Surgical emergency!

d) Bleeding in abdominal cavity can cause pain in the shoulder under the clavicle due to inflammation of the diaphragm by blood.

4. **Kidney Injury:**

a) Blow in the back near 12th rib.

b) Blood in urine.

c) Hospitalization and observation.

5. **Rupture of Full Bladder:**

a) The habit of a pre-game void practically eliminates this.

b) Rare, but it can occur.

6. **Blood coagulations:**

a) **Hemophilia** — can be present and unobserved; no characteristic appearance.

b) **Lack of stable coagulating factor** — A boy showing more than normal bleeding from tonsilectomy or teeth extractions or boys with unusual history of bleeding or having had transfusions in his past history — suggest check of coagulation time by team physician. May prove boy a poor risk in athletics.

c) **Lack of Blood Platelets** — Has a boy a history of excessive nose bleed and gum bleeding; does he **bruise easy;** are petechial hemmorrhage present? This boy may be a poor risk — have checked by team physician.

3:20

Open Forum Nerve and Internal Injuries

Dr. Louis J. Gogela, M.D.

Dr. Jon T. Williams, M.D.

Many fine questions were asked the panel; a few comments follow:

Dilation of one pupil of the eye getting progressively larger is an **emergency,** following blow to the head, especially if it does not react to light. Fixation of the eye may be a sign of brain damage. Rolling of the eyes is due to uncoordination of the eye musculature and is **not** in itself indicative of upper motor damage. This eye uncoordination will most usually subside in a short time and is in the same category as the return to consciousness. That is, when the brain is physiologically ready, the eyes will become coordinated.

If a high school boy has a history of a head injury (diagnosed as concussion), it is **not** a predisposition to his more easily receiving a second one in college or that the second head injury will be more serious if it is in the concussion category. (In Dr. Gogela's opinion, the first head injury, providing it was not serious and the physician's o.k. was given to continue participation, **should not** cause concern in terms of more proneness to a second injury.

NOTE: Any dilation of the eye following head injury is serious, GET A PHYSICIAN.

Trauma received in the region of the heart or pain in that area could be a sign of bruising of the cardiac muscle, and the boy should be seen by a physician. If such diagnosis is confirmed, the boy may be out of competition six weeks or more.

You cannot go wrong in applying cold to an acute abdominal injury, but you **can be very wrong** in applying heat.

JUNE 18, 1957

9:00

Physiology of Muscdle

Donald M. Pace, Ph. D.

Department Chairman.

Professor of Physiology, University of Nebraska.

Dr. Pace presented a most interesting lecture on human muscle. He explored the history of man's knowledge of muscle physiology from ancient times to the present. Interesting slides were presented showing the electro-microscopic findings of the complexity of the individual muscle fiber, which contains hundreds of fibrils and thousands of filaments inside the fibrils which collectively make up individual muscle fibers.

He commented on man's exploration after the turn of the century into the what and why of muscle contraction. The trigger was not known, neither was muscle chemistry to any great extent. Finally man found the true chemistry of muscle and the resynthesis of lactic acid (waste) was proven. He presented the phases of muscle contraction by projection of slides and commented that there is a neurological influence as well. In the first phase of muscle contraction there is no O2 present (anerobic phase); and in the second phase (aerobic phase), O2 is present and utilized. The athlete cannot store O2, neither can he perform without its presence in the muscles of his body. Excess of lactic acid breeds fatigue. The athlete can overdo his effort, get out of **balance,** and fatigue and muscle malfunction result.

9:40

Physiological Use of Hot and Cold

Gordon M. Martin, M.D.

Department of Physical Medicine

Mayo Clinic

Rochester, Minnesota

A highlight of the presentations was his remarks concerning technique.

A. **Local Application of Cold:**

1) Reduction of tissue temperature to considerable depth. (15° to 25° at a depth of two inches in the calf in two hours; in the cheek, 10° in 30 minutes.

2) Cutaneous vessels contract.

3) Blood flow is reduced.

4) Transcient general vasoconstriction.

5) Persistent general vasoconstriction.

6) Reduction of blood volume.

7) Painful pressure effect.

8) Reduction of cellular metabolism and O2 needs.

9) Local anesthetic effect.

10) Slowness of muscle action — sluggish contraction.

11) Increase clotting time of blood.

12) Destructive Effects — too long an application at too low a temperature (41° F. or lower for three hours, edema and swelling result and lymph volume increases; 45° F. is the critical temperature in the tissues.)

B. **Local Application of Heat:**

1) Reflex superficial vasodilation, (hyperemia).

2) Deeper Hyperemia — deep muscle dilation.

3) Local histamine production — (occurs with superficial dilation).

4) Some sensory reflexes.

5) Increase in local metabolism (Metabolites are one of the sources of local vaso-dilation).

6) Sedative effect on muscle.

C. **Present State of Knowledge of Heat Producing Modalities:**

1) **Conductive** — heat pads, hot baths, whirlpool (superficial heat producers). Wise to be cognizant that burns can occur.

2) **Radiant** — Infrared lamps, the tungsten filament and the carborundum rod units. The carborundum rod type is less penetrating than the tungsten filament but gives a greater sensation of warmth on the skin. Research into patterns of infrared sources reveal that the **terraced** type of reflector is by far the most efficient in terms of even heat distribution on the skin. The red pyrex bulb reflector gives an uneven, unsatisfactory pattern leading to hot spots. The round reflector also shows an uneven pattern of heat distribution. The "baker" source of heat is still an effective means of therapy.

3) **Short Wave Diathermy** — In the slides that Dr. Martin showed, short wave diathermy gives maximum benefit in terms of dilation and heat production in 30 minutes or more. This is a little longer than the conventional 20 minute treatment time. He also stated the **pre-heating** of an extremity in a whirlpool (30 min.) may afford better conduction of short wave energy and therefore offer a better treatment technique.

4) **Micro-Wave Diathermy** — The slides presented evidence that a 20-minute treatment time was the ideal method. Another slide showed the C-director to offer a slightly higher heat production in a **small** area in comparison to the A or B hemisphere type. Dr. Martin felt microwave diathermy was one of our better modalities when local, deep heat penetration is desired. He did, however, state that it can penetrate into bone, a characteristic not possessed by short-wave; and therefore, he preferred short-wave over a joint, particularly the knee.

5) **Ultrasonation — Ultra Sound:** It was explained by Dr. Martin that there are some athermal effects of ultrasound. This is still being evaluated and could prove to be much more valuable than the thermal effects. resently the thermal effect is the thing of value. Perhaps one of the main athermal effects is psychological. As far as Dr. Martin was concerned ultra-sound is now the "vogue," **but** there is far too much about it not yet known. He feels the acute trauma should still be handled in the conventional manner (cold, rest, etc.) for the first 24 or 48 hours, and perhaps on the third day ultra-sound is indicated. It is a **heat producer** and as such should not be used too early because of the chance of increasing the hemmorrhage.

10:10

Pathology

Dr. Frank H. Tanner, M.D.
Pathologist, Lincoln, Nebraska

Dr. Tanner emphasized that he would present some slides to help stimulate the panel discussion to follow. He discussed some of the changes seen in the heart following disease, showed slides of the results of sub-dural hemmorrhage, and talked about muscle injury. He reported on Myositis Ossificans as being present sometime after a bout with a severe muscle contusion and remarked that it can become fractured and when interfering with function should be removed. He also remarked that muscle tears **do repair** but perhaps not exactly the same as before due to connective tissue invasion. (He closed his presentation with a most unusual slide of a kidney removed from a patient injured in a shot gun blast. There was a pellet lodged directly in the pelvis of the kidney and Dr. Tanner remarked that if the patient had lived and passed the pellet in his void, it certainly would have stimulated the diagnosticians.)

10:30

Open Forum Muscle Injuries

Donald M. Pace, Ph. D.
Gordon M. Martin, M.D.
Frank H. Tanner, M.D.

Again questions were asked; only a few comments follow:

The panel was asked about scar (cicatrix) becoming smaller, and it was explained that scar tissue will contract over a given period of time.

Dr. Martin was asked about duration of cold. He commented on two to three hours length as probably the best technique. Also, he did not appear eager to institute any massage in the acute phase of injury. He did not advocate use of ultra-sound in acute injury and felt it was a highly potent modality to be used only by those qualified and trained in its use.

The panel felt that cold and heat are still among the best methods of treating athletic injury.

Micro-wave is a modality of considerable value when heating a great tissue depth is desired. Many inquiries, of course, were made about ultra-sound. Dr. Martin emphasized the conservative approach in his remarks.

PLEASE NOTE: The preceding program notes are the result of this writer making an attempt to record pertinent information as he heard it. In no way do I feel they are complete, nor do they bind me as to **complete accuracy.** The program was so rich and well done; and in my interest, the pencil may have slipped once or twice.

"Bob" Grant
Bob Grant, Ass't Trainer
Purdue University

N. A. T. A. Membership List

Abramoski, Ed, U.S. Military Academy, West Point, N. Y.
Aldrich, Donald R., U.S. Air Force Academy, Denver, Colo.
Andel, Buck, Georgia Tech., Atlanta, Ga.
Ariail, "Floogie", Wake Forest, Winston Salem, N. C.
Aten, Dennis W., Univ. of Nebraska, Lincoln, Nebr.
Bakke, Walt, Univ. of Wisconsin, Madison, Wisc.
Beeten, Robert L., Bowie High School, El Paso, Texas
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Billmire, Arch, Bike Webb Co., San Francisco, Calif.
Birtcher, Cecil, The Birtcher Corp., Los Angeles, Calif.
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Boucek, Bill B., Ottawa University, Ottawa, Kansas
Boughton, Lloyd L., Cramer Chemical Co., Gardner, Kansas
Boyle, Packey, University of Idaho, Moscow, Idaho
Brisnahan, Jim, Indiana University, Bloomington, Ind.
Broussard, Marty, Louisiana State Univ., Baton Rouge, La.
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Close, Mike, Macgregor, Cinncinnati, Ohio
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Doller, Joe, Dr., Chicago Cardinals, Chicago, Ill.
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Gwynne, A. C. "Whitey", W. Virginia Univ., Morgantown, W. Va.
Hall, Bill, John T. Riddell, Inc., Chicago, Illinois
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Howard, Kenny, Auburn Univ., Auburn, Alabama
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Reninger, Jim, MacGregor Co., Kansas City, Mo.
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Sparks, Marvin, Vibra-Whirl & Co., Panhandle, Texas
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Sullivan, Geo. F., Univ. of Nebraska, Lincoln, Nebr.
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Witkowski, Steve, Wesleyan Univ., Middletown, Conn.
Wojecki, Eddie, The Rice Institute, Houston, Texas
Wyre, Duke, Univ. of Maryland, College Park, Md.
Yocum, Chas. H., Becton Dickinson Co., Rutherford, N. J.
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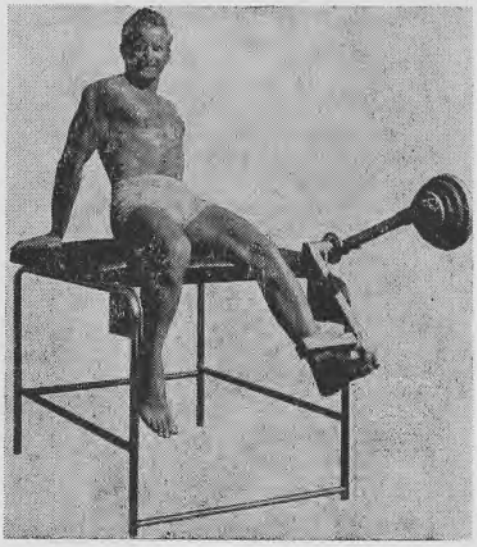
CONVENIENT

ADJUSTABLE



EFFECTIVE

COMFORTABLE

MOTIVATING

It is well known that the knee joint is one of the most commonly injured in athletics. Experience and mediical research have shown that the best way to prenvet knee injuries or to return injured knees to normal function is to strengthen the knee joint muscles, particularly the quadriceps, through the use of heavy progressive resistive exercises. THE N-K UNIT HAS BEEN SPECIFICALLY DESIGNED FOR THE MOST EFFECTIVE ADMINISTRATION OF PROGRESSIVE RESISTANCE EXERCISE TO THE IMPORTANT KNEE JOINT MUSCLE GROUP.

SIMPLE to operate. Patient places leg against leg contact. Weight arm is set for desired resistance and disc weights added. Nothing more is required — no collars, bars, buckles, or clumsy foot attachments. The unit is calibrated so that resistance can be varied without changing the weights.

Completely ADJUSTABLE from the smallest child to adult; accomplished by merely sliding the mobile leg rest to the desired position.

COMFORTABLE. Contact with leg is soft kid leather padded with foam rubber.

Maximum EFFECTIVENESS because the resistance can be given throughout the COMPLETE RANGE of knee joint motion with maximum resistance during the middle phases of joint range and diminishing resistance at either end, thus to coincide with the muscle force pattern. This is not possible with the usual technique of attaching the weighet directly to the foot.

CONVENIENT. It is possible to exercise both quadriceps and hamstrings without changing the patient's position. To change legs, simply place the unit in the opposite bracket.

MOTIVATION. Another unique feature is the built-in Range-of-Motion indicator which gives a measurement each time the exercise is performed, thereby giving an accurate day-to-day check on progress. This is not only convenient but an additional motivational factor for the patient. The ROM Indicator is included on every unit.

Note■ Weights are not furnished with the unit but any conventional disc weight or even sand bags .....may be used.

AVAILABLE IN TWO MODELS

Complete Assembly NK 100 B (pictured above) . . . The improved standard table model includes the new steel, all welded, chrome-plated table with padded maroon top in genuine Naugahyde and the NK 75B Torque Resistance Unit and brackets, completely assembled . . . (note price change) $179.50

Complete Assembly NK 200B . . . The Fold-A-Way Model (Space saving, designed to fold against wall when out of use) Includes the new steel, all welded, chrome-plated table for wall mounting with padded maroon top in genuine Naugahyde, NK 75B Torque Resistance Unit and brackets, complete and ready for wall attachment $179.50

Either of above but with Naugahyde Burnished Antique Color of your choice, 20 color selection, samples on request $192.00

FOR FURTHER INFORMATION WRITE

N-K PRODUCTS COMPANY

P. O. BOX 172 DALY CITY, CALIFORNIA

MEXSANA MEDICATED POWDER
Best For Routine Conditioning

Routine procedure of dusting Mexsana Powder into sports shoes, sweat socks, and street shoes reduces athlete's foot infection to a minimum, and establishes an important routine conditioning pattern for maintaining complete epithiel normalcy of feet. Mexsana Powder's exceptionally fine texture better absorbs moisture and helps control germs in difficult-to-reach prints of the skin. The Hexachlorophene in Mexsana Powder is an effective antiseptic that destroys up to 95% of irritating bacteria on the surface of the skin. By clinging to the skin, Mexsana Powder buffers chafe and skin rub due to socks and shoes... Order Mexsana Powder from your regular drug store . . . or your sporting goods dealer will order for you.

Samples and literature on request. Write Plough, Inc., Memphis, Tenn.

MUSTEROLE

Best For Fast Relief of Muscular Soreness, Aches, Pains, Strains

Always a popular counter-irritant among coaches and trainers, new, improved Musterole is far more effective than ever before. Super-stimulating oil of mustard plus the amazing pain-reliever, GM-7 (glycol monosalicylate), now makes this new, modern-formula Musterole give better, faster-acting, longer-lasting relief for sore, stiff muscles. Musterole gives deeper, warming "baked heat" relief of muscular aches, pains and strains. You can depend on Musterole whenever your players need a really effective counter-irritant... Order Musterole from your regular store... or your sporting goods dealer will order for you.

Samples and literature on request. Write Plough, Inc., Memphis, Tenn.

MUSTEROLE
Flushes Congestion To Ease Pain

MUSTEROLE, with super-stimulating oil of mustard plus amazing pain-reliever, GM7 (glycol monosalicylate), gives deep, penetrating counter-irritant action for sprains and sore, achy muscles. Goes to work faster to flush blood through congested areas for prompt relief, and help promote rapid healing.

Order from your neighborhood drug store.
For samples,
write Plough, Inc. Memphis, Tennessee

Eliminate Risk Of Infection.. *Routine use of Mexsana Medicated Powder*

prevents rash, gall, itch, chafing, abrasions in all strap or close-fitting areas—helps keep athlete's feet in good condition.

Order from your neighborhood drug store. For samples, research studies.. write Plough, Inc., Memphis, Tenn.