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MERAC by Universal tests and rehabilitates all planes of movement of the knee, ankle, hip, wrist, elbow and shoulder, even diagonal patterns, plus flexion/extension of the back. The system includes 35 attachments that can be quickly and easily adjusted to accommodate any body size, while insuring proper body alignment and functional movement throughout the range of motion. Setup can be accomplished in just minutes. And all MERAC attachments are marked for test/retest repeatability.

Call or write for more information or to arrange for a FREE demonstration. Ask about MERAC seminars in your area.
Correction

It was erroneously printed in the Fall Journal that the 1989 Annual Symposium will be in Fort Worth. Please correct that to read DALLAS in 1989. The update did not reach us in time for the Fall issue.

Member Activities

Please send items of interest concerning members (district news, individual accomplishments, credits, awards, etc.) to Dave Yeo, Athletic Training Department, Eastern Connecticut State University, Willimantic, CT 06226. Dave will announce such items to the entire membership in Association Activities.

Remember

The telephone number for the Journal Business Office is (919) 355-5144. The telephone number for the NATA Business Office is (919) 752-1725. NATA members should call the NATA number for answers to their questions or to update their membership records.

Abstracts

The deadline for submitting abstracts for Dallas is January 15, 1989. See “Research & Injury” in Committee Forum for full information.

Closing

Here’s hoping everyone had a very successful fall and is looking forward to enjoying the holiday season. Happy Holidays!

SY(SSSA)

Letter

Dear Mr. Yates:

I am the District V Representative to the Student Trainer Committee of the NATA. During our organizational meetings at the National Convention in Baltimore, a primary concern of our group was the failure to have adequate communication between certified supervisors and their students. An avenue which we discussed as being available to us to assist in correcting this problem is the ATHLETIC TRAINING JOURNAL. We hope to develop a chart or list of guidelines which can be published in our magazine which will remind ATC’s of such things as having their students renew their NATA memberships, submit their applications for scholarship, etc. A sub-committee was organized to work on this project and you will probably be notified by them in the near future.

continued on page 413
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Editorials

Athletic Trainers for Secondary Schools
Kenneth L. Knight

One of the goals of the NATA has been to promote the hiring of certified athletic trainers by our nation's secondary schools (see Ray, Athletic Training 23:32-35). Much of the public relations campaign and the efforts of the Research and Injury Committee are directed toward this end. And their efforts seem to be working. One of the articles in this issue may also help. "Certified Athletic Trainers in our Secondary Schools: The Need and the Solution" has excellent information for administrators interested in hiring an athletic trainer, or for athletic trainers to use in their efforts to convince secondary school administrators to hire an athletic trainer.

One member of the editorial board suggested that the manuscript was better suited for a journal associated with secondary school coaches, administrators or school boards. The article is written toward that audience so I passed this suggestion on to the authors. Their response convinced me to print the manuscript and part of their response. After detailing her involvement in promoting jobs for ATC's in Florida, Stopka wrote:

"We've learned that certified athletic trainers are the ones who need to get the ball rolling and work with these other people to get the schools to hire athletic trainers. Coaches and administrators need the knowledge and guidance of a certified athletic trainer to make an effective case, to draw up contract specifics, and to communicate effectively with other medical professionals. If our (ATC) colleagues could have access to this information, in addition to the other helpful NATA brochures and publications referenced in this paper, perhaps they could use some or all of it to help sell this very necessary 'dream'. A school board member alone, or PE teacher, coach or AD may learn to appreciate the need, but cannot sell it without direct ATC involvement and support. We ATC's must no longer tolerate apathy, especially our own. We must realize this goal. That is why I would like to once more submit this article to our Journal."

Readers are encouraged by the authors and Athletic Training to copy and disseminate the article as often as desired and to whomever will read it. In fact, we have published a copyright release statement with the article to facilitate this action.

Surely there must be other materials that would help "sell" secondary athletic training jobs. If you know of such materials, please send them to me or encourage the authors to do so. We'll continue to publish material that we feel will be helpful in promoting jobs in the high schools. We must increase the health care of our secondary school athletes.

But there is a flip side to this issue. How many athletic trainers with teaching credentials are there who are looking for a job? How many new young professionals who have this "dual certification" are we preparing to enter the job market each year? Bob Behnke, my colleague at ISU and chairman of the NATA Professional Education Committee, is concerned. He sees more and more graduates of curriculum programs who do not have teaching credentials.

For most students, obtaining a teaching certificate requires at least an extra year of college. Curriculum graduates who want to teach must earn a double major in addition to taking the teacher education courses. They major in athletic training, or earn the equivalent of a major, and must also earn a major in a teaching field (athletic training is not a recognized teaching field and you must have a major in a teaching field in order to become certified to teach). So obtaining dual certification is much more difficult than just getting a degree in athletic training.

So as we promote more positions in high schools, we must also promote preparing for those positions among our students. The positions will not help secondary school athletes if there is no one to fill the positions.

Protecting Our Most Valuable Resource: Our Kids
Steve Yates

American car manufacturers are now installing lap and shoulder safety belt systems in back seats on a model by model basis. By September 1989, every American passenger car will include them as standard equipment. That's good safety news for children according to the National SAFE KIDS Campaign.

The lap/shoulder belts offer parents another weapon in the fight against the number one killer of children —preventable injuries. Warning: safety belts are effective only if they're used, and used correctly. That's why the SAFE KIDS Campaign has prepared the following article and safety tips.

If you would like additional information, please call Nancy Reder (202/939-4993), or Kim Haddow or Kurt Guenther (202/338-7227).

Please take of couple of minutes to read this reprint of the SAFE KIDS release. A heeding of this reading could save your child's life.

AMERICAN KIDS NEED BACK SEAT SAFETY

The back seat of the American passenger car is about to become a safer place, and that's great news for America's children according to the National SAFE KIDS Campaign. Automobile accidents are still the leading cause of death and serious injury for children in the United States. According to the National Safety Council, 3,401 children, newborn to 14-year-olds, were killed and 180,000 were injured in motor vehicle accidents in 1986.

American car manufacturers have bowed to pressure from the marketplace and have begun installing lap/shoulder safety belts in back seats. By the time 1990 models roll off the assembly line in September 1989, all American passenger cars — with the exception of minivans — will be equipped with three-point safety belts in both the front and rear seats. A three-point safety belt combines the traditional lap belt with a shoulder strap that crosses the chest. The lap/shoulder belt is now standard equipment in the front seats of American-made cars.
Until now, most seat belt legislation has been aimed at front seat passengers, or adults, and has not addressed the safety needs of rear seat passengers — which are primarily children. Herta B. Feely, executive director of the National SAFE KIDS Campaign explained, "The installation of lap/shoulder belts in the back seat is long overdue. Their proper use could cut the risk of serious or fatal injury to children in half. The lives of more than a thousand children a year could be saved, if we can get parents to use the belts and use them correctly."

Even though the use of child safety belts is mandatory in all 50 states, 40% of parents of children under four still do not use them. Four out of five children age four and older either are not using seat belts or are not using them right.

Val Radovich, an engineer for the National Highway Traffic Safety Administration (NHTSA), explained that safety belts in combination with other child restraint systems make the back seat much safer for all children.

Current child restraint systems include infant, toddler and booster seats. According to Radovich, "The lap/shoulder belts do a good job of anchoring the seat and the child in place."

The safety of booster seats will be particularly enhanced by the addition of shoulder belts in the back seat. Radovich explained, "The lap/shoulder belt combination makes booster seats safer than a lap belt alone in protecting the child who’s outgrown an infant and toddler seat. The three-point belt diffuses the impact of a crash so that the upper torso, and not the abdomen, which is a much more vulnerable part of the body, takes the brunt of the collision."

Child Passenger Safety: It’s No Accident

Parents can reduce the risk of death and injury in motor vehicles by taking the following steps.

- Always use child restraint and seat belt systems. Some parents believe that the belts don’t have to be used on short trips, but 80% of all serious and fatal injuries occur in crashes within 25 miles of home and at less than 40 mph.
- Insist that your children ride in the back seat. Injury and fatality rates are 25 - 40% lower for children seated in the rear seat.
- Use safety seats and belts correctly. Properly used safety seats reduce fatalities by an estimated 71% and serious injury by 67%. Misuse of the seats can seriously compromise their effectiveness.
- Buckle lap belts low and snug across the hips, not across the stomach.
- If the shoulder belt crosses your child’s face or neck, place it behind the child and use the lap belt only.
- Never use a shoulder belt without using a lap belt at the same time. During a crash without a lap belt to hold your child in place, the child could slide forward and be choked by the shoulder belt.

The installation of the lap/shoulder belt in the back seats of American passenger cars gives parents one more weapon in the fight against the number one killer of children — preventable injury. The National SAFE KIDS Campaign is a five-year effort to teach parents, caregivers, policymakers and children about the problem and how to stop it. ©

Certificate and Plaque Order Form For NATA Certified Athletic Trainers

The Board of Certification is offering a graphically designed certificate printed in Old English Script with gold embossed NATA logo and seal of certification. Each certificate is professionally personalized with the athletic trainer's name, certification number, and date of certification. The certificate may be purchased on a 12" x 18" hardwood plaque protected by plexiglass, or ordered as the certificate of Certification only.

Please indicate below which of these two alternatives would better suit you:

_____ I wish to order the plaque mounted certificate for the price of $45.00 each.
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Enclose this order form with a check or money order in payment for the plaque or certificate and mail to the following address:

NATA BOARD OF CERTIFICATION
1001 East Fourth Street
Greenville, NC 27858

Use a permanent street mailing address. No post office boxes please. Delivery will be by United Parcel Service. (allow 4 to 6 weeks for delivery)

NAME _______________________________________________________________
(as you wish it to appear on the certificate)

ADDRESS ____________________________________________________________

CITY_________________    STATE_________________    ZIP____________

Certification Number __________________________

Certification Date __________________________
Dear Members,

I hope your fall sports have been exciting and injury free. I am very pleased to announce that on October 11, 1988 the NATA, Inc. and Medipren reached a SIX year agreement that will prove beneficial for all of us. Our Executive Director, Otho Davis, and Mr. Kim Zeitlin, our legal counsel, are to be commended for their efforts in finalizing this contract. In addition, negotiations for the purchase of the Dallas property are proceeding satisfactorily.

By now you should have received your first NATA NEWS newsletter. I hope you enjoyed it as much as I did.

The Board of Directors will meet in February to discuss and review job descriptions formulated by the Board-appointed search committee pertaining to the full-time Executive Director and assistant (or full time person) as you have asked us to do. Many other important issues will be discussed as well.

Please express your ideas on how we can improve and grow stronger to your Director or to me.

Have a good year.

Sincerely,

Mark J. Smaha
ABSTRACT: Tennis elbow is the common term for lateral epicondylitis. This disorder, recognized since the 19th century during which the game of tennis evolved, results from the repetitive trauma sustained in the extensor carpi radialis brevis tendon at the lateral epicondyle. Histologically, the tissue changes have been termed fibroangioplastic hyperplasia (7). This occurs from increased load forces sustained from improper biomechanical techniques. The conservative management technique is highly successful with complete healing rates around 92% and requires about six to eight weeks to complete the healing process. The treatment regimen consists of 1) ice, 2) anti-inflammatory agents, 3) rest, 4) exercise to prevent detraining of the body, 5) progressive resistive exercise for the injured elbow, 6) equipment changes/modifications, and 7) biomechanical technique changes. If the player has not responded to the above regimen, then either an infiltration of a corticosteroid into the tendon area or surgery is needed. However, the surgical treatment requires a much longer period for healing and rehabilitation (greater than 3 months). Tennis elbow can be effectively treated and cured, but the best way to treat this pathologic state is with proper prevention.

ETIOLOGY

Tennis elbow symptoms most commonly result from an inflammation at the attachment of the extensor carpi radialis brevis muscle at the lateral epicondyle (7,8) [see Figures 1 and 2]. It may also involve the extensor communis and the extensor carpi radialis longus. One must also be aware that the muscle bellies and musculo-tendinous junctions may also be involved. Nirschl and Sobel (8) labelled the injury and inflammation as “fibroangiomatos hyperplasia” which is, histologically, a reparative tissue. Due to limited muscle attachment at the epicondylar area, there is a great force load developed at that point when the muscles contract to hit the ball. Since it commonly appears in persons over 40 years old, it could be described as a degenerative process. Other studies have shown tennis elbow to be an accumulative process (10). Thus, repetitively hitting a technically inadequate back hand may lead to tennis elbow (2).

SIGNS AND SYMPTOMS

The classic symptoms of tennis elbow are a distinct tender point or pain elicited by palpation over the lateral epicondyle, pain over the same area when the hand is extended, and/or weakness observed in both the wrist and hand grip areas (8). Although the first appearance of the above symptoms should encourage the athlete to seek appropriate medical attention, they usually wait until it is too late. If the player seeks treatment from a physician, then an x-ray should be taken to rule out associated possibilities of a fracture, loose body or other elbow joint problems.

TREATMENT

Nirschl (6,7,8) has reported a success rate of 92% by using the multifocal treatment approach. Other physicians (5) have reported similar success using his method. The treatment goals are to reduce pain and inflammation by icing for 30 minutes to three hours per day. Duration of ice application depends on the severity of the symptoms as well as pain duration. Non-steroidal anti-inflammatory drugs (NSAID) are very important and useful in conjunction with the cryotherapy. Typical NSAIDs used are ibuprofen (Motrin, Advil, Medipren), piroxicam (Feldene), indomethacin (Indocin) and naproxen (Naprosyn). Oral corticosteroids (Medrol) may be
used but should be reserved for the most severe cases refractory to NSAIDs.

The athlete should avoid the stroke(s) which causes the pain but may use other strokes that do not elicit pain. Participation in cycling, running, aerobics, and other such activities should be encouraged to avoid detraining.

Once the pain is alleviated enough so that the athlete may painlessly shake hands with someone, begin a progressive exercise program. The program consists of flexibility, isometric, and dynamic training exercises for the wrist extensors and the shoulder (11). Increased resistance is allowed as the level of pain decreases and as pain tolerance increases. Active motion and strengthening of the affected musculotendinous unit may or will aid healing (8). Additional recommended components of treatment in severe cases are high volt electrical muscle stimulation (HVEMS), TENS, ultrasound and hydrotherapy, giving the trainer, therapist or physician some alternatives in recalcitrant cases. One recommended HVEMS treatment is 20 min of negative polarity at approximately 60-80 pulse/sec, with intensity adjusted to the patient's tolerance (8).

Even though the athlete may return to playing, he or she must not be allowed to return to full competition until completely symptom free. In addition to actual medical treatment there must be modifications in the individual's tennis biomechanics, which will be discussed in the next section. The usual process takes from six to eight weeks. Once there is normal strength (the dominant arm should be 5-10% stronger than the nondominant arm), full non-painful flexibility, and a pain-free state without medications, the athlete may return to competition (5).

If the conservative approach fails, a physician may want to use local steroid infiltration (2 ml of 0.5% lidocaine mixed with 20 mg of triamcinolone) or surgery. Two to three weeks of rest for the elbow are needed after infiltration due to possible potential for tendon rupture. Surgery is performed in about 8% of cases (7), with a success rate of 92-96% (1,7).

Although promoted by some people, DMSO (dimethyl sulfoxide) has been shown to be ineffective in the treatment of tennis elbow at a 70% solution. However,
TECHNIQUE AND EQUIPMENT MODIFICATION

Correct playing and stroking techniques are the most important preventative measures to consider (10). If the athlete is serious about his/her game and wishes to prevent tennis elbow, a thorough analysis of their game is essential. Even though modification may be somewhat costly, optimal pain-free performance is contingent upon finding efficient ways to avoid the offending overload forces. Tennis lessons and stroke evaluation by a qualified tennis teaching professional (USPTA certified or Professional Tennis Registry certified) is the first step. Altering racquet strokes and/or changing equipment is important, having been shown by some studies to be 100% effective (10).

Optimal racquet handle size for an individual's grip can be measured anthropometrically using the Nirschl technique (6). An estimated grip size is made by placing a tape measure on the radial border of the ring finger and measuring from the proximal palmar crease to the tip of the ring finger. This measurement represents an excellent guide for proper handle/grip compatibility (6,10). Proper racquet grip size helps decrease torque on the racquet thus decreasing injury potential at the tendon site (6,10).

Concerning equipment selection and modification, graphite and composition racquets are best for absorbing the energy of impact. Light weight racquets (12-12½ oz) are preferable to heavier racquets. The recommended type of racquet string is 16 gauge nylon, and the recommended tension is two to three pounds less than the manufacturer's suggested tension for the particular racquet (6). Also, a foam rubber device (Vibrasorb by Donnay) can be inserted in the string pattern to absorb excess vibrations and minimize transmission of stress to the elbow. Another possible modification is an oversized racquet. It has a larger "sweet spot" which decreases torque when a tennis ball is hit off center.

Forearm extensor braces are used frequently and help allay painful symptoms as well as enhance the healing process (6,8). Do not use pressureless or dead tennis balls, and change playing surfaces when possible. The better surfaces for treatment and prevention of tennis elbow are the slow surfaces (clay, Har-Tru).

References

CEU Credit Quiz

TENNIS ELBOW: A BRIEF REVIEW OF TREATMENT
James C. Sterling, MD, MS, Michael C. Meyers, MS
Frank Walters, PhD, ATC, R. David Calvo, MD

As an organization accredited for continuing medical education, the Hahnemann Medical College and Hospital certifies that this continuing education offering meets the criteria for .3 hours of prescribed CEU credit in the program of the National Athletic Trainers' Association, Inc., provided the test is used and completed as designed.

To participate in this program, read the material carefully and answer the questions in the test. Mark the answers you select by placing an X in the proper square. Then xerox the test sheet, fill in your name, address and other information, and mail with $12 for processing to Hahnemann University, School of Continuing Education, Broad and Vine, Philadelphia, PA 19102.

The NATA National Office will be notified of all members with passing scores over 70%. CEU credit will be issued to each member's record at that time. Participation is confidential.

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<tr>
<th>Questions</th>
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<td>1. Tennis elbow occurs exclusively in the lateral epicondyle.</td>
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<td>a. True</td>
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<td>b. False</td>
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<td>2. Anatomically, tennis elbow may involve the</td>
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<td>1. extensor communis.</td>
<td>a. 1,2,3</td>
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<td>2. extensor carpi radialis longus.</td>
<td>b. 1,3</td>
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<td>3. muscle bellies.</td>
<td>c. 2,4</td>
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<td>4. musculotendinous junctions.</td>
<td>d. 4 only</td>
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<td>e. 1,2,3,4</td>
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<td>3. Tennis elbow may be described as a degenerative process.</td>
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<td>a. True</td>
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<td>4. Classic symptoms of tennis elbow include</td>
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<td>a. paresthesias in the thumbs.</td>
<td>a. 1,2,3</td>
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<td>b. pain over the lateral epicondyle with the hand extended.</td>
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<td>c. wrist weakness.</td>
<td>c. 2,4</td>
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<td>d. b and c above</td>
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<td>e. all of the above</td>
<td>e. 1,2,3,4</td>
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<td>5. Which of the following treatments is/are used routinely for the management of tennis elbow?</td>
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<td>a. oral corticosteroids</td>
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<td>b. application of ice to the affected area</td>
<td>b. 1,3</td>
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<td>c. both a and b above</td>
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<td>d. none of the above</td>
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(May be xeroxed)
Questions

6. A progressive exercise program for rehabilitation of the athlete with tennis elbow is initiated when there is no
   a. pain with palpation of the area,
   b. pain upon shaking hands with someone,
   c. problem with paresthesias in the hand,
   d. b and c above
   e. all of the above

7. Recommended treatments for severe cases of tennis elbow include
   a. 1, 2, 3
   1. galvanic stimulation.
   2. TENS.
   3. ultrasound.
   4. hydrotherapy.
   b. 1, 3
   c. 2, 4
   d. 4 only
   e. 1, 2, 3, 4

8. The Nirschl technique
   a. is a surgical procedure for correcting tennis elbow.
   b. is an exercise program for rehabilitating the athlete with tennis elbow.
   c. is a method for altering racquet strokes.
   d. aids in determining optimal racquet handle size.

9. For prevention of tennis elbow it is recommended that the racquet
   a. be light weight.
   b. have 16 gauge nylon strings.
   c. both a and b above
   d. none of the above

10. Clay is a preferrable playing surface for treatment and prevention of tennis elbow.
    a. True
    b. False

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Hahnemann University by March 15, 1989

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Name ____________________________
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Check one
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☐ College  ☐ Other (please specify) ____________________________
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Certified Athletic Trainers in Our Secondary Schools: The Need and the Solution

Christine Stopka, PhD, ATC
David Kaiser, MPE, ATC

ABSTRACT: The purpose of this article is to provide athletic trainers with a comprehensive, yet brief and effective, document which can be used in addition to other NATA publications and brochures, to help convince coaches, administrators, parents, school board personnel and state legislators to work more aggressively to increase the number of certified athletic trainers in our nation’s secondary schools. The most recently known injury statistics are presented and discussed along with current NATA policies and recommendations to support the need for certified athletic trainers. For example, despite the fact that over 636,000 injuries occur every year in football alone, fewer than ten percent of the nation’s high schools currently employ certified athletic trainers, resulting in only one certified athletic trainer for every 5,500 high school athletes. Several hiring solutions are discussed briefly, including the full-time athletic trainer, the district athletic trainer, the permanent substitute teacher/athletic trainer, the assistant athletic director/athletic trainer, the part-time athletic trainer, the contracted athletic trainer, the graduate assistant athletic trainer, and the teacher/athletic trainer. Although the full-time teacher/athletic trainer is the ideal model, all of the alternatives are viable and should be considered. The teacher/athletic trainer model is emphasized due to its immediate economical feasibility. The medical, legal, and educational benefits of employing a certified athletic trainer are discussed in some detail. Finally, the actual mechanics of locating a certified trainer for a position, i.e., via the NATA’s Hotline service, is presented.

THE NEED

There are approximately 24,000 high schools in the country with 5.6 million student athletes (5). Nearly one in six of these athletes will have injuries serious enough to be classified as time-loss injuries (5,6). Time-loss injuries, as defined by the National High School Injury Reporting System, are those that require the player to suspend activity for at least 21 days (5). Approximately 100,000 of these injuries will occur in football (6). Of all interscholastic sports injuries will be severe enough to preclude participation in sports for at least 21 days (5). Each year, about 36 youngsters will die or become permanently paralyzed as a result of accidents from their interscholastic participation (4). Seemingly, many of these injuries can be prevented or at least lessened in severity by employing certified athletic trainers. Athletic trainers are educated and trained to prevent, evaluate, treat and rehabilitate injuries. Thus, a means exists to reduce the number and severity of high school injuries but, principally due to lack of public awareness, very little is being done to rectify the problem. Fewer than ten percent of the nation’s high schools employ certified athletic trainers (6). At the professional and college levels, there is one certified athletic trainer for every 25 professional and college athletes. In contrast, there is only one certified athletic trainer for every 5,500 high school athletes (4). When physical education classes and intramural sports are added, this ratio drops much lower.

In comparison to collegiate and professional athletes, high school athletes have the least access to health care professionals. Secondary school athletes are younger and less mature physiologically and athletically than their collegiate counterparts (3). It is somewhat ironic that the level of athletic competition that has the greatest need for athletic trainers is where the fewest are found (4). Further, the legal community is strongly advising high schools to hire certified athletic trainers (1). School systems would be less likely to be held liable for injuries if certified athletic trainers were included on the athletic staff (1,2).

THE SOLUTION

At least eight viable methods exist for hiring a certified athletic trainer. These may include a full-time athletic trainer, a district athletic trainer, a permanent substitute teacher/athletic trainer, an assistant director/athletic trainer, a part-time athletic trainer, a contracted athletic trainer from a sports medicine center, a graduate assistant athletic trainer, or a teacher/athletic trainer (4,5). The options where the athletic trainer is on-site for the entire school day generally allow the individual to be more effective in injury prevention, care, and rehabilitation.

The full-time athletic trainer is the ideal, but rare, option. This person would be responsible for overseeing the entire sports medicine program for both boys’ and girls’ sports. He/she would have the tasks of consulting with coaches about prevention and conditioning programs as well as scheduling athletic training coverage to maximize the efficiency of the program to the satisfaction of all concerned. Organization and administration of injury records, supplies, and equipment...
would also be the responsibilities of this individual. In addition, the athletic trainer would consult with parents, physicians, and therapists about particular students' injuries and individual rehabilitation programs. Although the full-time athletic trainer is the ideal solution, this option may not be financially or administratively feasible for some schools.

A second alternative is the district athletic trainer. In this option the cost of one athletic trainer is shared by the schools in the district. In the mornings the athletic trainer can schedule time to be at each school for evaluation of injuries, consultation with coaches and athletes, rehabilitation, etc. However, in the afternoon and evenings when the athletic trainer is needed most, he/she can only be in one place at a time. Although this model saves money and is a step in the right direction in providing athletic training services, the option obviously has deficiencies and inadequacies in relation to sports coverage and program effectiveness.

The permanent substitute teacher/athletic trainer option involves using the person as a substitute teacher during the school day and then as the athletic trainer after school. The major drawback here is the uncertainty of a day to day schedule for the individual which can significantly interfere with rehabilitation schedules, medical consultations, and necessary administrative duties.

The assistant athletic director/athletic trainer can assist the athletic director in whatever functions are deemed appropriate. Hopefully, the athletic training duties would be attended to as a first priority and major responsibility. This option could be viable depending on the intensity of the added administrative responsibilities of this position.

The part-time athletic trainer is an option that appears to be economical for the school; however, the athletic trainer usually gets relatively little compensation for the time demands of the job. Because of that, there is typically a high turnover rate which detracts from the consistency and effectiveness of the program.

The services of an athletic trainer could be contracted from a sports medicine center or physical therapy clinic. The drawback with this option is that the school loses a degree of administrative control for the employee related to hiring, dismissal, salary, and the like. The "boss" for this athletic trainer is the administrator of the center or clinic.

If a high school is located near a college or university, the services of a graduate student athletic trainer might be obtained. Again, this is a cost saving option for the school, but there will usually be a new athletic trainer every one or two years as the graduate student completes his/her studies and moves on. Additionally, if the graduate student is not a certified athletic trainer one of the college athletic trainers will have to visit the high school daily and serve as the supervising athletic trainer, especially if other students are working toward certification at the high school.

The teacher/athletic trainer option may be the most affordable for obtaining athletic training services. A teacher/athletic trainer is an individual who teaches in an academic area during the day and serves as the athletic trainer for the sports teams after school. The teacher/athletic trainer could receive an amount equivalent to coaches supplements in pay for his/her services as the athletic trainer for all sports, all year, male and female (4). Like other teachers, and unlike some contracted athletic trainers, the school system would have full administrative control of this person. If possible, this person's teaching load would be reduced to allow for some of the tasks detailed in the discussion of the full-time athletic trainer. To assist with the heavy time demands on the athletic trainer, some schools hire two certified teacher-athletic trainers. This way no new positions need to be created; only monies in the range of coaches supplements are necessary.

Due to economic feasibility, the teacher/athletic trainer option may be an especially desirable option, at least initially, for schools just starting the service. Once a minimal number of certified athletic trainers are employed in the school system, interested teachers presently employed at the schools can work toward becoming eligible for certification by assisting the certified athletic trainers. In two to five years, depending on the necessary coursework accomplished and the number of hours completed, one or more certified athletic trainers could be in every middle school and high school, costing a minimal amount of dollars but providing tremendous medical, legal, and educational benefits to all concerned.

MEDICAL BENEFITS

At least one benefit of hiring an athletic trainer will be the peace of mind for the administrators, coaches, parents, and students that a qualified professional exists at their school to provide effective prevention, evaluation, treatment, and rehabilitation of athletic injuries. Physical education students and intramural participants, if given access to the athletic training room, can also benefit greatly from the athletic trainer's service and educational advice related to the treatment, rehabilitation, and prevention of their activity related injuries.

LEGAL BENEFITS

The employment of a certified athletic trainer will decrease the possibility of litigation being brought against the school (1,2). Those in charge of sports activities have a legal duty to provide adequate medical assistance to injured participants (7). This duty is fulfilled when satisfactory medical assistance is provided within a reasonable period of time. If a doctor in attendance at a sports event provided "immediate and reasonable medical assistance" to an injured athlete, "liability would presumably not be found" (7). The athletic trainer is able to provide more extensive coverage of both competitions and practices than a physician (1). The hiring of a certified athletic trainer not only fulfills the legal duty to provide medical assistance, but also it shows a clear, demonstrable policy by school officials that they are concerned with securing the best health care possible for their student athletes (1,2). Indeed, the escalation of scholastic professional liability insurance premiums could possibly slow if the hiring of certified athletic trainers was the norm rather than the exception (5).

EDUCATIONAL BENEFITS

A significant benefit of having a certified athletic trainer on staff is the educational services available. Education and counseling of athletes, coaches, administrators, and parents are part of the athletic trainer's daily duties. As discussed above, the presence of a certified athletic trainer provides new career opportunities for the existing high school staff. By assisting the athletic trainer, these individuals can begin the path to becoming certified athletic trainers.

High school students can also benefit academically from the presence of a certified athletic trainer on staff. The certified athletic trainer would be the person to
teach any athletic injury courses the school might offer. High school students can assist the certified athletic trainer and thereby possibly qualify for college scholarships. For example, those who have worked as high school student athletic trainers may qualify for full or partial scholarships for room, board, tuition, books, and/or other financial assistance. Many athletic training students, as well as students majoring in other disciplines, have paid their way through college by serving as student athletic trainers. Many of these people were able to qualify for that position due to their previous high school athletic training experiences.

LOCATING CERTIFIED ATHLETIC TRAINERS

Certified athletic trainers, including those certified to teach various subjects, are available and can be located. One way to find prospective applicants is to contact the National Athletic Trainers’ Association (NATA) National Office (919-752-1725 or 1-800-334-NATA) to place an employment advertisement on the free Hotline service. The NATA staff will make a recording of the position specifics and place it on the 24 hour a day, seven days a week Hotline Service. Since certified athletic trainers looking for positions should know to call the Hotline service for job information, it should not take long for the employer to be contacted by prospective job applicants. Anyone is welcome to contact the National Athletic Trainer’s Association’s National Office for further information regarding the employment of certified athletic trainers in their secondary school.

References


Author’s Note: We encourage colleagues to reproduce and disseminate this article as often as needed if they find that the information is facilitative in improving upon the desperate need for more certified athletic trainers in our nation’s secondary schools.

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Normative Strength Values for Knee, Shoulder, Elbow and Ankle For Females Ages 9-73 as Determined by Isokinetic Testing

Gail Weldon, MS, ATC
Susan L Snouse, BS, ATC
Sandra Shultz, MS, ATC

ABSTRACT: Data were collected over a five year period from a sample of 1,282 females between the ages of 9-73 using a Cybex II Isokinetic Dynamometer. Peak torque at 60 degrees/second or 30 degrees/second in 5 reciprocal joint motions was obtained. The purpose of this testing was to develop normative strength data for a healthy female population. These norms can be used in the development of strength training and rehabilitation programs. In all cases of joint motion mean peak torque values increased with increasing age. The highest peak values occurred within the 19-30 year age group. Torque values progressively and incrementally decreased with further increase in age. Torque values in each age group consistently increased with increased weight, until reaching subjects weighing 220 pounds or more.

Isokinetic evaluation and exercise has increased greatly in recent years. This increased use has created a need for normative data.

Molnar and Alexander (1,18,19) published normative data on knee and elbow extension and flexion in children ages 7-15. Numerous studies (6,7,8,9,10,11,12,13,14,15,16,17,20,21,22,23,25,26,27,28) have followed. The majority of these (6,10,11,12,14,15,20,21,23,25,26,28) have focused on the knee. The remaining literature offered limited numbers of studies identifying normative data on other joints (1,7,8,16,21,25,27). A factor not accounted for in previous norms is the degenerative nature of such categorization. All activity levels were analyzed together under the assumption that athletes would comprise the highest extreme of the range, while the sedentary population would generally comprise the lowest extreme of the range. All age groups included a range of athletes who were competing in some sport activity to sedentary individuals.

A Cybex II Dynamometer (Cybex, Division of Lumex, Inc., Ronkonkoma, NY. 1980) with dual channel recorder was used to measure peak torque. It was calibrated monthly as recommended by the manufacturer, using manufacturer’s procedures (2). The testers were certified athletic trainers familiar with the Isolated Joint Testing and Exercise protocols (2). Each tester received a written protocol for administering the test and all were trained by one individual.

Each subject completed a five minute submaximal Fitron warm-up at 90RPM at 600 KPH or less. Upon completion the subject began a series of flexibility exercises. Each exercise was held for a count of ten and completed three times. Hamstrings, quadriceps, gastrocnemius, low back, anterior shoulder girdle and posterior shoulder girdle were stretched.

Standard testing procedures as outlined by Cybex were used for each joint tested (2). Each subject was given four to six submaximal trial repetitions and one to two maximal trial repetitions before testing. Each subject was allowed a brief rest (less than two minutes) prior to testing. Four voluntary maximum contractions, not corrected for gravity, were used to obtain peak torque output. Peak torque values for five reciprocal joint motions were collected. These included knee flexion/extension, shoulder flexion/extension, and elbow flexion/extension, tested at 60 degrees/second. Ankle inversion/eversion and plantar/dorsiflexion were tested at 30 degrees/second as suggested by the manufacturer (2). The testing was randomized so as to eliminate dependent ordering effect. Testing order assured that no muscle group was tested without rest.
### Table 1a
Isokinetic Knee Extension in Females  
(Ft. lbs. Torque; Mean and Standard Deviation)

<table>
<thead>
<tr>
<th>Age Group (Yrs.)</th>
<th>9 - 12</th>
<th>13 - 18</th>
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<th>46 - 60</th>
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<tbody>
<tr>
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<td>18</td>
<td>76</td>
<td>449</td>
<td>570</td>
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<tr>
<td>(Torq. Range)</td>
<td>27.0-88.5</td>
<td>39.0-150.0</td>
<td>34.5-195.0</td>
<td>35.5-163.0</td>
<td>26.5-146.0</td>
<td>35.0-75.55</td>
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* = Less than 5 subjects

### Table 1b
Isokinetic Knee Flexion in Females  
(Ft. lbs. Torque; Mean and Standard Deviation)

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<tr>
<th>Age Group (Yrs.)</th>
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<th>19 - 30</th>
<th>31 - 45</th>
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<td>449</td>
<td>570</td>
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<tr>
<td>(Torq. Range)</td>
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<td>Weight (lbs)</td>
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* = Less than 5 subjects
## Table 2a
Isokinetic Shoulder Extension in Females
(Ft. lbs. Torque; Mean and Standard Deviation)

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<th>Age Group (Yrs.)</th>
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<th>19 - 30</th>
<th>31 - 45</th>
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## Table 2b
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* = Less than 5 subjects
### Table 3a
**Isokinetic Elbow Extension in Females**
*(Ft. lbs. Torque; Mean and Standard Deviation)*

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* = Less than 5 subjects

### Table 3b
**Isokinetic Elbow Flexion in Females**
*(Ft. lbs. Torque; Mean and Standard Deviation)*

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* = Less than 5 subjects
### Table 4a

Isokinetic Ankle Inversion in Females  
(Ft. lbs. Torque; Mean and Standard Deviation)

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* = Less than 5 subjects

### Table 4b

Isokinetic Ankle Eversion in Females  
(Ft. lbs. Torque; Mean and Standard Deviation)

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<tr>
<th>Age Group (Yrs.)</th>
<th>9 - 12</th>
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* = Less than 5 subjects
Table 5a
Isokinetic Ankle Plantarflexion in Females
(Ft. lbs. Torque; Mean and Standard Deviation)

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<th>Age Group (Yrs.)</th>
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<th>19 - 30</th>
<th>31 - 45</th>
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<td>449</td>
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<td>Mean</td>
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</table>

* = Less than 5 subjects

Table 5b
Isokinetic Ankle Dorsiflexion in Females
(Ft. lbs. Torque; Mean and Standard Deviation)

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<th>Age Group (Yrs.)</th>
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<th>19 - 30</th>
<th>31 - 45</th>
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<td>449</td>
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<td>147</td>
<td>22</td>
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</table>

* = Less than 5 subjects
periods between subsequent test. All joint tests were completed in the same testing session.

The age groupings were determined as follows: preadolescent 9-12, adolescent 13-18, young adult 19-30, adult 31-45, menopausal 45-60, post menopausal over 60. Total body weight groupings were divided into 10 pound increments.

RESULTS

Mean peak torque values are presented for each muscle group as it related to age and weight in Tables 1-5. In all cases of joint motion, peak torque increased with increasing age with the highest peak values occurring within the 19-30 year age group. Values progressively and incrementally decreased with further increase in age. Mean torque output increased with increased body weight in all age groups. The exception to this occurred in certain subjects over 220 pounds. These individuals frequently displayed a decrease in torque output in upper extremity and ankle inversion/eversion.

DISCUSSION

The use of normative data is controversial, but if used properly relative to the specific population they can be used as guidelines for testing and/or rehabilitation (4). The trend toward unlimited sports participation for women has created a need for normative peak torque data (6). These data allow clinicians to set rehabilitation and training goals for females specific to their weight and age group. The scarcity of data on women over 30 was increasingly apparent as this study progressed. The increase in masters level athletes as well as the numbers of women involved in all levels of recreational activities would seem to indicate the need for information on this group. The fact that torque values continue to increase until 30 should provide professionals responsible for strength training programs with an increased expectation for strength development in older athletes. The fact that the 31-45 age group shows only a 20% drop in values for isokinetic testing of shoulder strength. Abstract. Med Sci Sports Exercise 12: 441, 1980.

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There has been much discussion concerning the anthropometric variables that influence strength. Strength has been shown to be correlated to age (1,18,19), height and weight (6,12,13,22,23,28). Data available on children prior to this study were categorized by age and height. However, the range of mean scores in this study closely resembled those noted by Molnar and Alexander (10) who evaluated 25 9 to 15 year old females. The similarity in the range would suggest that both height and weight may be used with age to identify reasonable norms for children. This study also supports the works of others (7,8,9,11,14,26) in that age is a primary contributing factor to the decrease of strength.

Hopefully, the normative peak torque data will serve as a base to enable clinicians to identify realistic strength goals for healthy female clients. The clinician will be able to evaluate each client with relation to age and weight. These guidelines should be of benefit in the development of both strength training and rehabilitation programs. Prior to this study there were no norms to use as guidelines for return to activity for the older female athlete. Continued study is recommended to develop increased normative data for women. Areas suggested for further study include, power, agonist/antagonist ratios, body weight to torque output and lean body weight to torque output ratios.

References

24. Scudder GN: Torque curves produced at the knee during continued on page 366

Volume 23 Number 4 • Athletic Training 331
On impact, becomes lateral protective brace that shields the knee and diffuses impact.

Spools are fixed pulleys on contoured thigh and calf plates that maintain position, wrapped or taped.

Unique action loop floats on spools, moves with player; doesn't pre-load ligaments.

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9160 Shanley Lane • Auburn, CA 95603

U.S. Patent 4,832,097; foreign patents pending.
Isokinetic Torque Production of the Shoulder in a Functional Movement Pattern

Robert W. Day, MA, ATC
Robert J. Moore, PhD, ATC, PT
Patricia Patterson, PhD

ABSTRACT: The purpose of this study was to evaluate the power production of the shoulder across a spectrum of speeds in functional movement patterns. Thirty-four male volunteers (18 to 29 years old) who had not participated in a throwing sport since their sophomore year in high school, were free of injuries to the shoulder and arm and had no cardiac pathology participated. Each subject performed reciprocal contractions of both shoulders in the movement patterns of F/Ab/ER and E/Ad/IR at 60, 120, 180, 240, and 300 degrees per second on a Cybex II isokinetic dynamometer. Torque at 90 degrees from full F/Ab/ER was calculated for each movement at all five speeds for both arms. Significant differences in mean torque production were found between the two movements for both arms. Mean torque production decreased significantly (p<.05) as the contraction speed increased for both arms and movements. F/Ab/ER mean torque was not significantly different between the non-dominant and dominant arms. The same was true for E/Ad/IR. The ratios of F/Ab/ER to E/Ad/IR were not significantly different between the two arms. The ratios did not change as the testing velocity increased. Intraclass reliability coefficients for trials at each speed and for each of the movements ranged from R=.935 to R=.977. Calculations were also made for reliability across speed for the two movements. F/Ab/ER was lowest (R=.795) while E/Ad/IR was higher (R=.870). This study investigated comparisons between the non-dominant and dominant arms of non-throwing sport males by calculating torque at a specific angle of movement which decreased the effect of gravity and eliminated "overshoot". Previous research has used peak torque measurements and made no allowances for the effect of gravity on torque production in the shoulder.

The purpose of this study was to evaluate the power production of the shoulder, at a specific movement angle, across a spectrum of speeds in a functional movement pattern. There were two specific objectives of the study. The first was to compare the dominant and non-dominant arms in the movement patterns of flexion/abduction/external rotation (F/Ab/ER) and extension/adduction/internal rotation (E/Ad/IR). Second, was to determine the ratios of F/Ab/ER to E/Ad/IR.

METHODOLOGY

Thirty-four physically active males (age =21.1 ± 3.1 years; height = 71.3 ± 2.8 inches; weight = 168.4 ± 19.1 pounds) volunteered for the study. Seven (21%) were left arm dominant; 34 (79%) were right arm dominant. Subjects were screened for shoulder, elbow, hand, and heart problems and were informed of all risks before signing a consent to participate. None of the subjects had participated in any interscholastic, intercollegiate, or professional throwing or modified throwing sport since their sophomore year in high school.

A Cybex II Isokinetic Dynamometer (1982 model) was used in combination with the Upper-Body Extremity Testing Table (UBXT).* Testing was done at 60, 120, 180, 240, and 300 degrees per second. The speed selector and dual channel recorder were calibrated according to manufacturer's specifications (4). The torque channel

EDITORS NOTE: This paper was awarded 1st place in the 1987 NATA Research Contest.

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Robert J. Moore and Patricia Patterson are with the Department of Physical Education, San Diego State University, San Diego, California 92182.

*Cybex Division of Lumex, Inc., Bayshore, NY
was set for 180 foot-pounds and the goniometer 300 degrees. A dampening of two was selected. The chart paper was run at 25 millimeters per second to allow for greater accuracy in measuring the torque and range of motion.

The UBXT was positioned at an angle of approximately 30 degrees to the dynamometer. This position established the functional movement pattern of F/Ab/ER and E/Ad/IR as described by Knott and Voss (14). The long, L-shaped lever arm with the rotating hand grip was attached to the dynamometer to allow for proper positioning of the subject's arm. Proper E/Ad/IR position was established when the subject's elbow fell between the nipples and the hand across the opposite hip (Figure 1). Correct F/Ab/ER occurred when the elbow fell next to the ear and the hand touched the restraining pad attached to the UBXT (Figure 2).

Testing was done in groups of five subjects. The order of speeds and dominant and non-dominant arms was randomized for each subject. Once the subject was secured to the UBXT and proper alignment achieved, a warmup bout was performed. The subject began the movement in full E/Ad/IR with the forearm pronated so that the thumb was pointing to the floor. The subject was instructed to reach over the head, gradually supinate the forearm, and point the thumb to the floor again. Instructions were then to return to the starting position. After instruction, the subject was moved and guided through the testing range of motion by the tester. This was repeated until the tester was confident the subject understood the motion.

Each subject was instructed to perform three sub-maximal repetitions, at what the subject perceived to be 50 to 75 percent of maximum effort, then to perform one maximal effort, all at 150 degrees per second. A one-minute rest period followed.

During the rest period the goniometer alignment on the dual channel recorder was established. The subject's shoulder was placed in full F/Ab/ER with the hand and hand grip resting on the restraining pad above the head (Figure 2). The goniometer baseline was then established, adjusted, and marked on the chart paper.

The speed selector was set to the first testing speed. The tester instructed the subject to perform three sub-maximal repetitions and one maximal repetition. This protocol is similar to that used by Johnson and Seigel (18) who found that stable measurements in the knee occurred when three sub-maximal trials followed by three maximal efforts were used for a warmup. A one minute rest followed.

The subject then performed three maximal reciprocal repetitions if the testing speed was 60 degrees per second, or five maximal repetitions if the speed was 120, 180, 240, or 300 degrees per second. Three repetitions at 60 degrees per second was used due to the intensity of the slow speed contraction. A one minutes rest followed each exercise bout. These procedures were followed until all five speeds were tested.

The same procedure was followed for each of the five subjects in the group. After the entire group had been tested on one arm, testing was repeated for the other arm with testing and speed order maintained.

The torque generated at 90 degrees of movement from full F/Ab/ER was then calculated for each movement of each repetition. The 90-degree position was chosen for torque measurements for four reasons. First it allowed the subject time to reach the speed of the machine and develop torque. Second, it eliminated any "overshoot" problems inherent with the electronics of the recorder and the higher speeds of movement (26, 35). Third, the effect of gravity was minimized due to the horizontal movement of the apparatus at the point of torque measurement (10, 24, 26, 35). Finally, a consistent angle of torque measurement was used to stabilize and more accurately compare the data.

Each subject's values were averaged for each speed and used in the data analysis. The ratio of the average F/Ab/ER torque to E/Ad/IR torque was also calculated from the average values for each speed. The data were analyzed using five separate analyses of variance (the non-dominant shoulder, the dominant shoulder, the F/Ab/ER data, the E/Ad/IR data and the ratio data) with repeated measures (13, 15, 18). A two (non-dominant and dominant arms) by five (speeds) factorial design was used. The conservative Geiser-Greenhouse method was used to evaluate the F-ratios with post hoc analysis.
using the Scheffe test (15, 37). An alpha level of .05 was used for all analyses.

Intraclass reliability coefficients between trials and speeds were calculated for trends in the data (19, 34, 46). Ten two-way analyses of variance were used to evaluate the trials of F/Ab/ER and E/Ad/IR at each of the five speeds. Reliability coefficients were also calculated for the two movements across speed.

RESULTS

The mean torques for F/Ab/ER decreased as the speed of movement increased for both the non-dominant and dominant arms (Table 1). The same trend was present for E/Ad/IR for both arms. The non-dominant arm produced more torque in all but two cases. The dominant and non-dominant arm ratios remained the same as the contraction velocity increased.

Mean torque production of F/Ab/ER was less [Scheffe (4, 29) > 3.92, p = .05] than E/Ad/IR for all speeds in both the non-dominant and dominant arms. The differences between the two movements decreased as the speed of contraction increased.

Mean torque production decreased significantly [Scheffe (4, 29) > 3.92, p = .05] as contraction speed increased for both movements with both arms. A significant change in torque production for both movements was found as speed increased except for 60 to 120 degrees per second with the non-dominant arm and 60 to 120 degrees per second with the dominant.

F/Ab/ER and E/Ad/IR mean torques were not significantly different between arms (Table 1). The ratios of F/Ab/ER and E/Ad/IR were not significantly different between the two arms (Table 1). There was a significant difference in the ratios as the speed of testing increased; however, no significant pairwise comparisons could be found. A trend of slightly decreasing ratios with increased velocity was seen with the dominant arm while the non-dominant ratios were very similar.

Reliability coefficients ranged from .93 to .98 for trials for each of the movements. Lower correlations were found for speed than for trials. F/Ab/ER was lowest (R = .795) and E/Ad/IR was highest (R = .970).

DISCUSSION

No other studies were found which measured functional movement patterns. However, other authors have made bilateral comparisons using linear movement patterns. Ivey (11) reported no difference between non-dominant and dominant shoulder torques at a slow and a fast speed (degrees per second not given) with shoulder internal and external rotation, abduction and adduction, and flexion and extension even though the dominant shoulder consistently recorded greater torque. Smith et al. (29) reported no difference in peak torque between the right and left sides in ice hockey players.

Two other studies reported bilateral torque comparisons of baseball pitchers (1, 23). Aldernick and Kuck (1) tested high school and college baseball pitchers and found the only significant differences to be dominant shoulder flexion at 210 degrees per second (p = .04) and non-dominant external rotation at 210 (p = .002) and 300 degrees per second (p = .008). Their data indicated a trend toward bilateral equality. However, the large variation in age (14 to 21 years) and pitching experience of the subjects may have caused a regression of the data toward the mean. Perrin and Robertson (23) tested pitchers, swimmers, and non-athletes and found dominant shoulder flexion and extension at 60 and 180 degrees per second and internal rotation at 180 degrees per second to be significantly (p < .05) stronger for the entire group of subjects. There were, however, no inter-group comparisons made so the non-throwing sport subjects (swimmers and non-throwers) may have caused a data regression and distorted the possible dominant arm strength of the pitchers.

The use of functional movement patterns in the present study makes it difficult to compare the torque outputs to studies using linear movement patterns; however, such a comparison reveals large data differences (Table 2). Non-dominant and dominant shoulder peak torques reported by Perrin and Robertson (23) at 60 and 180 degrees per second and those reported by Aldernick and Kuck (1) at 120 and 300 degrees per second are larger than the mean torques we measured. Both authors used different types of subjects than ours, and more importantly, the previous investigators used peak torque measurements, the standard Cybex testing protocol, and made no corrections for the effect of gravity.

Peak torque may not occur at the same point in the range of motion with each repetition and particularly with increasing velocities. This can be seen clinically but has not been studied for the extremities. In trunk flexor and extensor musculature, as the velocity of contraction increased, so did the angle at which peak torque occurred (5, 32). Unfortunately, these changes were not investigated by the authors.

The standard Cybex testing protocol for flexion and extension requires the subject to be in a sitting position for testing (4). In this position the shoulder flexes against gravity and extends with gravity, thus causing a decrease in actual torque production in the movement against gravity (flexion) and an increase in actual torque production with extension (24, 26, 35). While we did not correct for the effect of gravity, it was minimized by testing the subjects in a supine position and taking the torque measurements at the 90 degrees of movement position which was perpendicular to gravity.

The relationship of antagonistic muscle groups within the major points of the body have been reported by numerous authors (3, 6, 21, 30, 36). Similar data has been reported for the shoulder in linear movements but no previous data exist for the functional movement patterns.

Knee extension torque has been reported to be significantly greater than flexion torque at all tested speeds (3, 8, 36). Davies and Gould (5) and Thompson et al. (32) also found extension torque to be higher than flexion in their studies on the trunk. However, they did not test for significance.

Our data indicating the ratios between the contralateral muscle groups of both upper extremities for each speed are not different is consistent with the fact that there was no difference between the non-dominant and dominant torque values. Similarly, the ratios were not different across speeds for either arm. This is in contrast to what has been reported for the knee (3, 6, 8, 27, 29, 30, 36). These studies indicated that the peak torque ratios tend to increase as the speed of testing increases. Some studies have shown similar trends in ratios across speeds with the shoulder (1, 7, 11, 23).

Aldernick and Kuck (1) found small but significant (p < .05) differences in ratios of shoulder abduction/adduction, external/internal rotation, and flexion/extension across speeds when looking at peak torque. Two studies showed shoulder flexion/extension ratios similar to the present study. Dummer et al. (7) found peak torque ratios of .76 and .67 at 180 degrees per second when testing two female masters level swimmers. Perrin and
Robertson (23) found peak torque ratios of .67 and .70 at 60 degrees per second and .67 and .70 at 180 degrees per second with the right and left shoulders, respectively. However, the data were not broken down by subject group, nor was the difference between speeds tested. Ivey (11) reported a shoulder flexion/extension ratio of 0.80 after testing 31 subjects at two speeds, but did not identify the speeds or separate the ratios by speed.

The different antagonistic ratios of the knee and shoulder may be explained by the fact that the two joints are dissimilar arthrokinematically. The knee is a sellar joint with two degrees of freedom acting across a single joint. The shoulder girdle contains three degrees of freedom with numerous muscle groups acting across three true joints and two pseudo joints (17, 34).

Continued assessment of the relationship of the non-dominant and dominant arms of throwers, non-throwers and sedentary subjects should be continued. Investigations should continue across the full spectrum of available speeds.

The decreased effect of gravity and the constant measurement angle are two contributing factors that may also be responsible for the differences in ratios. A change in hamstring/quadriceps ratios was reported by Schlinkman (27) after correcting for gravity. Peak torque hamstring/quadriceps ratios decreased. Also, the ratios did not increase at the same magnitude with increasing speed as has been reported by other research.

### Table 1

<table>
<thead>
<tr>
<th>Test Speed</th>
<th>Movement Pattern</th>
<th>Means ± Standard Deviations</th>
<th>Range</th>
<th>Dominant</th>
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<tr>
<td></td>
<td></td>
<td>Non-Dominant</td>
<td>Non-Dominant</td>
<td>Non-Dominant</td>
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<tr>
<td>60°/sec</td>
<td>F/Ab/ER</td>
<td>40.1 ± 7.1</td>
<td>39.9 ± 7.3</td>
<td>27.7 - 59.0</td>
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<td>E/Ad/IR</td>
<td>59.2 ± 13.3</td>
<td>56.9 ± 14.6</td>
<td>33.7 - 107.3</td>
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<td>F/E Ratio</td>
<td>.70 ± .14</td>
<td>.74 ± .21</td>
<td>.50 - 1.05</td>
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<tr>
<td>120°/sec</td>
<td>F/Ab/ER</td>
<td>37.1 ± 7.7</td>
<td>36.5 ± 7.0</td>
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<td>E/Ad/IR</td>
<td>56.3 ± 13.6</td>
<td>55.8 ± 11.8</td>
<td>38.6 - 94.0</td>
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<td>F/E Ratio</td>
<td>.67 ± .12</td>
<td>.67 ± .14</td>
<td>.43 - .95</td>
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<tr>
<td>180°/sec</td>
<td>F/Ab/ER</td>
<td>33.9 ± 7.2</td>
<td>33.7 ± 6.8</td>
<td>22.4 - 55.5</td>
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<td>E/Ad/IR</td>
<td>51.2 ± 11.8</td>
<td>51.2 ± 10.2</td>
<td>33.8 - 94.0</td>
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<td>F/E Ratio</td>
<td>.67 ± .12</td>
<td>.67 ± .14</td>
<td>.43 - .95</td>
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<tr>
<td>240°/sec</td>
<td>F/Ab/ER</td>
<td>30.0 ± 6.2</td>
<td>29.3 ± 5.7</td>
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<td>E/Ad/IR</td>
<td>46.6 ± 12.4</td>
<td>46.4 ± 9.4</td>
<td>25.6 - 86.3</td>
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<td>F/E Ratio</td>
<td>.67 ± .12</td>
<td>.64 ± .11</td>
<td>.44 - 1.00</td>
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<td>300°/sec</td>
<td>F/Ab/ER</td>
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### Table 2

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<th>Test Speed</th>
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<th>Aldernick (1)</th>
<th>Present Study</th>
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<tr>
<td>No. subjects</td>
<td>45 Flex, 45 Ext</td>
<td>26 Flex, 26 Ext</td>
<td>34 Flex, 34 Ext</td>
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Non-Dominant Arm

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<th>Aldernick (1)</th>
<th>Present Study</th>
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<tr>
<td>60°/sec</td>
<td>62.8</td>
<td>90.2</td>
<td>40.1 - 59.2</td>
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<td>120°/sec</td>
<td>51.8</td>
<td>73.8</td>
<td>33.9 - 51.2</td>
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<td>180°/sec</td>
<td>26.5</td>
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<td>240°/sec</td>
<td>65.7</td>
<td>98.4</td>
<td>39.9 - 56.9</td>
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<tr>
<td>300°/sec</td>
<td>54.6</td>
<td>81.0</td>
<td>33.7 - 51.2</td>
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Dominant Arm

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<th>Test Speed</th>
<th>Perrin (23)</th>
<th>Aldernick (1)</th>
<th>Present Study</th>
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<td>60°/sec</td>
<td>40.7</td>
<td>77.2</td>
<td>36.5 - 55.8</td>
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<tr>
<td>120°/sec</td>
<td>54.6</td>
<td>81.0</td>
<td>33.7 - 51.2</td>
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<td>180°/sec</td>
<td>28.2</td>
<td>57.9</td>
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<tr>
<td>300°/sec</td>
<td>36.5</td>
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ers (3, 6, 8, 30, 36). In our study the gravity effect was reduced due to the fact that the arm was moving perpendicularly to gravity at the point of torque measurement.

The major contributing factor to the lack of change of antagonistic ratios may have been the constant position of torque measurement. No other studies have held the angle of measurement constant, in this case 90 degrees to the horizontal, when taking torque measurements.

Further research should continue to control the angle of torque measurement and the effect of gravity. The relationship between antagonistic movements needs to be compared using peak torque and specific angles. Gravity adjusted testing should be compared to traditional testing positions and measurements.

Johnson and Siegel (12) calculated intraclass reliability coefficients to be .94 in 40 subjects using the knee extensors at 180 degrees per second. Our subjects produced slightly higher R values for the two movements with reliability calculated at .970 for F/Ab/ER and .966 for E/Ad/IR.

Little and Sinning (16) reported similar intraclass coefficients (.989-.995) for shoulder horizontal flexion and extension at 60, 150, and 240 degrees per second with 24 subjects. No other investigators calculated the reliability of peak or mean torque values across various speeds. We found the coefficients for F/Ab/ER to be R=.795 while E/Ad/IR rotation was R=.870 across the five speeds.

The lower reliability of F/Ab/ER may be due to two factors. First, the overall power of F/Ab/ER was found to be approximately 67% of E/Ad/IR in the present study. Muscle groups with greater strength are more reliable in their production of force (2, 25). Second, the flexion movements of the shoulder involve numerous, complicated force-coupling and synergistic mechanisms of the scapula and rotator cuff which makes motions with flexion more complicated and possibly less reliable. There are numerous small muscle groups involved in shoulder flexion while extension involves primarily larger muscles.

The ratios of F/Ab/ER to E/Ad/IR found in this study must be looked at carefully. The fact that one movement of the ratio, extension, is considerably more reliable than the second, flexion, may contribute to inaccurate ratios.

Further evaluation of the intraclass reliability of trials and speed is needed to determine the best testing protocols for each joint.

CONCLUSIONS

Based on the results of this study, the following conclusions can be made in regard to this group of subjects.

Mean torque measured at 90 degrees of movement was not different between the non-dominant and dominant arms in a function movement pattern. Similarly, the ratio of the two movements, F/Ab/ER to E/Ad/IR, were similar across the five testing speeds.

The torque development of E/Ad/IR was significantly greater than that produced by F/Ab/ER. This held true across the entire spectrum of speeds tested.

Torque production decreased significantly as the speed of movement increased. However, the ratio of the two movements was not different as the speed increased.

It has been assumed that the dominant limb is always stronger than the non-dominant in the major muscle groups of the shoulder. The results of this study on the group of subjects tested casts doubt on this concept.

References

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Hydrocolloid Dressings in the Treatment of Turf Burns and Other Athletic Abrasions

Morris B. Mellion, MD
Denise M. Fandel, MS, ATC
Wayne F. Wagner, MS, ATC
Mark A. Kwikkel, MA, ATC

ABSTRACT: “Turf burns” and other forms of abrasions sustained while participating in sports present a special challenge for professionals who care for athletes; in addition to the usual problems of wound care, these lesions may limit performance both in practice and competition. Thirty-two college football players sustaining partial-thickness skin abrasions were treated with hydrocolloid dressing (Duo-Derm®) following an open protocol. One athlete failed to complete the protocol due to personal scheduling conflicts. The abrasions all healed in 4-8 days (average 5.7). Using a subjective rating scale, experienced athletic trainers rated skin appearance at discontinuation of treatment 26/31 (83.9%) “good” to “excellent” and 5 (16.1%) “average” for abrasion healing. The dressings met standard requirements for general abrasion healing plus special objectives for care of abrasions in athletes: 1) adherence in spite of sweating, 2) tolerance of clothing and equipment motion, 3) tolerance of increased body motion, 4) tolerance of shearing and collision forces of contact sports, and 5) prevention of wound exudate transmission to other athletes. A set of guidelines for the use of hydrocolloid dressings is presented.

Abrasions, known as “turf burns” or “grass burns” in football, “mat burns” in wrestling, and “road rash” in bicycling, are common in athletics. Although they generally heal within a few weeks and without complication, our experience indicates that they are often painful and sometimes difficult to manage. Occasionally, they inhibit performance, and, on rare occasions, even prevent participation by the athlete. They are particularly troublesome when they occur over the extensor surface of a joint such as the elbow or knee. All abrasions, even the most superficial, must be considered contaminated, and cleansed and dressed accordingly. There are numerous products on the market designed to protect the wound, promote healing, and permit the individual with skin wounds to resume normal activities (1-3, 10-15, 21).

Traditionally, abrasions have been treated in many ways, including salutary neglect allowing scab (eschar) formation (23), a variety of unguents (8), topical antibiotic ointments (2,9), sterile gauze pads (2,8,20), and non-adherent dressings (such as Telfa and Dermicel) (7,20). More recently, a variety of self-adherent occlusive dressings (DuoDerm, OpSite, Second Skin, and Tegaderm) have been used as well (2, 15).

This study evaluated a wound care regimen employing DuoDerm® hydrocolloid dressing in athletic abrasions. The hydrocolloid dressing consists of two layers, an outer 2 mm occlusive layer of polyurethane foam and an inner hydrocolloid polymer complex consisting of gelatin, pectin, carboxymethylcellulose sodium, and polyisobutylene.

MATERIALS AND METHODS

Thirty-two college football players at the University of Nebraska at Omaha, with “turf burns” and other partial-thickness skin abrasions incurred during football practice or competition, made up the study population. Of these, 31 completed the protocol; one athlete dropped out due to time conflicts with the dressing change protocol. All participants were between the ages of 17 and 22. None had erythema of the surrounding skin, fever, cellulitis of the surrounding skin, or an unusual odor or color of the wound exudate. All subjects gave informed consent and adhered to the following protocol:

The skin area around the wound was shaved a minimum of one inch from the edge of the wound. The wound was cleansed with povidone iodine. Residual povidone iodine was removed with sterile saline lavage prior to the application of the dressing. If there were visible foreign body particles, they were scrubbed or debrided out. The surrounding skin was carefully dried. An identification label and dressing and a measuring scale were placed adjacent to the wound but outside of the treatment field, and the wound was photographed.

A DuoDerm® hydrocolloid dressing (Convatec, A Squibb Company, Princeton, NJ) was cut to size so that it would extend at least ¾ inch beyond the wound margin in all directions. The protective backing was removed from the dressing with special care to avoid contact with the adhesive (sterile) layer. The hydrocolloid dressing was applied directly over the wound, paying particular attention to the wound margins. The dressing was smoothed in place for a few seconds to

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increase initial adhesion. If the abrasion was on an extremity, the DuoDerm was covered with taping underwrap which was then held in place by elastic tape. If the surface did not lend itself to this type of reinforcement, the DuoDerm edges were taped using hypoallergenic, water-resistant tape. The athlete was instructed to look for any "channeling" or leakage of the exudate to the dressing margin. The athlete was instructed that if this occurred, he was to report for a dressing change at the earliest possible time.

A mandatory dressing change occurred on Day 2 for each subject. The wound was labeled and photographed with the hydrocolloid dressing in place. The dressing was then removed. The wound was rinsed with saline, and another photograph was taken with the label and a measuring guide in place. Any changes in the appearance of the wound were noted on an evaluation form. The wound was then redressed with hydrocolloid dressing, as on Day 1. If the athlete was to practice, a layer of "combine" dressing, a thick soft material, was placed over the hydrocolloid dressing and held in place with taping underwrap and elastic tape. The athlete was instructed to return after showering following practice or competition for an inspection of the dressing to insure that no damage to the integrity of the dressing was incurred during the athletic participation.

Dressing removal was performed with great care to eliminate potential reinjury of the newly formed epithelium. Although the hydrated gel formed by the wound exudate and the dressing was lavaged off at each dressing change, it was not considered necessary to remove all traces of dressing material from the wound surface. Subsequent dressing changes were made:

1) when there was leakage of wound exudate;
2) when the hydrated gel formation visible through the dressing reached within ¼ inch of the border; or
3) on Day 5, if the dressing had not been changed since Day 2; and
4) every two days following dressing changes which took place on Day 4 and thereafter.

The procedures as described previously were followed at all dressing changes. Evaluation forms were completed at the times of dressing changes and at the completion of the protocol. These rated the appearance of the wound to the investigator. A subjective rating system was used by the investigators to describe the lesions at the time that healing was deemed complete enough to discontinue treatment (Table 3). The patient’s subjective appraisal of comfort of the wound between dressing changes and at the time of dressing change was also recorded on the evaluation form.

RESULTS

The average healing time of all abrasions was 5.7 ± 1.2 days (Table 1). There was no variation in healing time by location of the abrasion in these partial-thickness injuries (Table 1), nor with the size of the lesion (Table 2). It seemed healing time was more closely related to the depth of the abrasion than to size; however, no objective measurement technique was available to gauge the depth of the abrasions.

Most (26 of 31, 83.9%) lesions were rated "good" to "excellent" in appearance at the time the treatment was discontinued (Table 3). The remaining five (16.1%) were rated "average." Of these four were noted to be dry and scaly, and one was noted to be fragile.

When the athletes were questioned at the completion of the protocol about the comfort of the abrasions with the hydrocolloid dressings in place, 27 of the 31 indicated that the abrasions were comfortable, while
only four experienced significant discomfort.

No infections or allergic reactions, including skin sensitization to the hydrocolloid dressing, were noted in any of the 31 athletes who completed the protocol or the one who dropped out.

Figures 1a-d illustrate the progression of a typical abrasion from time of injury to completion of therapy.

**DISCUSSION**

The objectives of wound care for all abrasions include:
1) to debride the wound of necrotic tissue;
2) to promote re-epithelialization of the denuded skin site;
3) to avoid infection;
4) to reduce pain at the wound site;
5) to avoid skin sensitization and allergic reaction; and
6) to engender patient compliance with the regimen. In addition, athletes with abrasions have several special objectives of wound care:
1) a dressing must adhere to the skin surface in spite of sweating;
2) it must protect against clothing and equipment which rub and move over the wound site;
3) it should tolerate the increased body motion of sports participation;
4) it should withstand the shearing and collision forces of contact sports; and
5) it should prevent transmission of wound exudate to other competitors in contact sports.

We found that the hydrocolloid dressing met all these objectives of wound care for abrasions:

**Wound Debridement**

Hydrocolloid dressing debrides abrasions through a process termed “autolysis,” which results in a clean wound bed (10,21). The dressing provides a moist environment in which the body’s own regenerative processes may function to debride damaged tissue. Wound exudate interacts with hydroactive particles in the dressing to form a soft, moist gel. This gel functions as an excellent environment for both the skin’s own self-debridement process and rapid re-epithelialization. It also permits dressing removal without damage to newly formed epithelium (10,12).

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similar to, but different than, those of purulent drainage. When the wound bed is cleansed of residual gel and hydrocolloid material, however, the healing epidermis and dermis demonstrate the fresh pink color of healthy wound healing (12,19). The healing in this environment is similar to that which takes place in a blister, where the wound bed is bathed in tissue fluid covered by the intact epidermal surface of the blister.

Re-Epithelialization

The cornerstone of abrasion healing is re-epithelialization of the epidermis. In the unprotected wound, a scab, or eschar, forms to provide a somewhat protective outer cover for the new wound. When an athlete is exposed to the rigors of practice or competition, the eschar is often sheared off or damaged through motion and contact. The healing process must begin anew, thus delaying the time to full healing and prolonging pain and disability.

Abrasions heal by new epidermis developing from the wound edge toward the center of the lesion, and from islands of surviving epithelial cells in hair follicles and sweat glands radially outward, until a confluent layer is formed over the previously denuded area. This process is retarded by dry eschar formation. As the new epidermis develops, it “migrates below the dehydrated fibrous tissue” of the superficial dermis to a depth where “there is sufficient moisture for the cells to live.” This is a slow process. Winter (22,23) demonstrated that if eschar formation is avoided by the use of an occlusive dressing to keep the wound moist, the new epidermis forms over the superficial layer of the surviving dermis; and re-epithelialization occurs twice as fast as in wounds exposed to air while healing. Hinman and Maibach (14) demonstrated that split-thickness wounds in human volunteers healed more rapidly when occluded with a polyethylene film than when exposed to air. Subsequent research demonstrates that a variety of semi-permeable and occlusive dressings promote rapid re-epithelialization (1,3,10,12,13,16,19,21).

Occlusive Dressings and Bacterial Infection

A major theoretical concern about occlusive dressings is that they might promote the development of bacterial infection. Mertz and Eaglestein (17) have shown that under a semi-occlusive polyurethane film dressing bacteria indeed multiply, but “do not interfere with the re-epithelialization of partial-thickness wounds.” In a later study, Mertz et al. (18) demonstrated that the occlusive hydrocolloid dressing protected wounds from externally applied staphylococcus and pseudomonas bacteria, whereas the semi-permeable OpSite and Vicon dressings did not. Buchan and associates (5) demonstrated that the cell types and distribution in the exudate which accumulated under an adhesive polyurethane film dressing (OpSite) were typical of an inflammatory response and that the neutrophils were bactericidal for staphylococcus aureus at a rate similar to that of whole blood. They concluded that the risk of clinical infection, as opposed to colonization of bacteria, would be minimal with this type of dressing. Friedman and Su (10) reported there were no clinical signs of tissue infection in a series of 22 patients with 31 leg ulcers treated with hydrocolloid dressings. One patient did exhibit super-colonization of the wound with a new pathogenic bacteria, but he disclosed that he had been removing the dressing daily to observe the condition of the wound. Hermans and Hermans (13) treated 61 burn patients with hydrocolloid dressings and noted three infections. Of the three, one patient was using the dressing improperly; a second had pre-existing erythema, suggesting an already present tissue infection; and the third was using the dressing normally. Several groups have demonstrated series of patients using hydrocolloid dressings to cover skin graft donor sites without any development of clinical infections (3,16,19). In all of these studies, re-epithelialization was faster than previously experienced with other types of dressings, in spite of identifiable bacterial contamination.

Our results reaffirmed the extremely low rate of clinical wound infection found by others studying hydrocolloid dressings (3,10,13,16,19).

Pain Reduction

Abrasions, like burns and skin graft donor sites, are typically very painful. Previous research has demonstrated that hydrocolloid dressings relieve or eliminate the pain of burns and skin graft donor sites (10,12,13,19,21). Our results extend observation to abrasions as well. Only 4 of 31 abrasions (13%) were significantly uncomfortable during treatment with hydrocolloid dressing.

Lack of Skin Sensitization

Numerous studies of hydrocolloid dressings in burns, skin graft donor sites, and skin ulcers have indicated an absence of skin allergy or hypersensitivity to hydrocolloid dressings (10,12,21). Our results in abrasions echo their findings.

Compliance

The high rate of subject compliance with the protocol (97%) would lead one to anticipate a similarly high level of patient compliance in a routine medical care or training room situation. When the study was designed, we considered an open protocol comparative study, with other forms of abrasion care. It was decided, however, to conduct the single-method study because of previous poor compliance by our athletes using other abrasion therapies. Hydrocolloid dressing care for partial-thickness abrasions requires an initial application, a dressing change on Day 2 in all but the most superficial abrasions, and further dressing changes only if there is enough wound exudate to approach within 1/4 inch of the dressing margin or to actually leak out of the dressing. For most athletes, this requires a minimum of time and effort compared to the benefits of rapid wound healing and pain reduction.

Special Wound Care Objectives in Athletes

The special objectives for wound care in athletes were achieved. Hydrocolloid dressing adhered extremely well to the skin surface, in spite of the sweating. The dressing not only has the property of adhering to dry skin, but it also attaches securely to skin in the presence of moisture. This property, called “wet tack,” is the result of hydroactive particles in the dressing interacting with wound fluid to create additional adhesion (6).

The rapid healing rates demonstrated in Tables 1 and 2 attest to the fact that the hydrocolloid dressing, protected by underwrap, combined dressing, and elastic bandage, protected against friction of clothing and equipment and the shearing and collision forces of football participation. The movement of the athlete’s body did not seem to loosen the dressings. They were flexible enough to adhere well even over the extensor surfaces of major joints. The combination of
the hydrocolloid dressing itself and the outer protective layers used during participation prevented transmission of exudate to other competitors.

Guidelines for Abrasion Care with Hydrocolloid Dressings in Athletes

Based on our experience during this study, we offer the following guidelines for abrasion care with hydrocolloid dressings in athletes:

1. Cleanse wound with povidone iodine or equivalent anti-bacterial scrub and remove residual scrub with water or saline lavage.
2. Scrub out or debride any visible foreign body particles.
3. Shave > 1" beyond wound margin. Then dry surrounding skin.
4. Cut hydrocolloid dressing to size so that it extends at least ¾" beyond wound margin. Remove protective backing with special care to avoid contact with the adhesive (sterile) layer. Apply directly over wound and smooth in place to increase initial adhesion.
5. If the abrasion is on an extremity, it should be covered with taping underwrap which is then held in place with elastic tape. In contact and collision sports an additional layer of "combine" dressing or other padding may be added for participating and secured with taping underwrap and an elastic bandage.
6. In all but small and/or very superficial abrasions the dressing should be changed at 24 hours. The wound may be rinsed with water or saline at this time, but the dressing should be changed at 24 hours. The wound generally 6-7 days after injury. If healing is incomplete, 6-7 days after injury. If healing is incomplete, a fresh dressing should be applied.
7. Subsequent dressing changes should be made if: a) there is leakage of wound exudate; or b) the hydrated gel formation visible under the dressing reaches within ¼" of the border.
8. The dressing should be removed for wound evaluation when it is estimated that healing is completed, generally 6-7 days after injury. If healing is incomplete, a fresh dressing should be applied.
9. A hydrocolloid dressing should not be left in place for longer than 7 days.

References

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Conservative Management of Shoulder Impingement Syndrome

Edward Mulligan, PT, ATC

**ABSTRACT:** Shoulder Impingement Syndrome is the end result of cumulative microtrauma to subacromial tissues enclosed within the unyielding suprhumeral space. It is a difficult entity to treat and is best managed through musculoskeletal screening and prevention. Impingement type pain and disability in the athlete's shoulder is likely of pathomechanical origin. Proper treatment is aimed at recognizing abnormal biomechanics, addressing etiological factors, and understanding soft tissue capabilities and limitations. It is the athletic trainer's responsibility to understand the implications of this type of shoulder dysfunction and then skillfully apply his knowledge.

Chronic or recurrent subacromial shoulder pain is a common complaint of athletes of all ages. Soft tissue impingement beneath the coracoacromial hood is frequently the basis for this unfortunate phenomena. In sports such as tennis, swimming, baseball, volleyball, and gymnastics, an athlete's shoulder is required to repetitively perform overhead activities at or just below maximal levels of tissue tolerance. Such activities may stress the subacromial tissues beyond their physiological capabilities. Without synchronous force couples and coordinated movements, this cumulative stress results in microtrauma, more commonly referred to as overuse. This paper presents a comprehensive approach to the assessment and management of those etiological factors inherent to the development of this type of shoulder pathology.

**ANATOMY**

The roof of the subacromial space is formed by a bony and fibrous arch consisting of the acromion and coracoacromial ligament. The coracoacromial ligament is triangular in shape, originating from the coracoid process and traversing posteriorly, laterally, and superiorly to insert on the undersurface of the acromion. The humeral head, with the rotator cuff tendons inserting on its prominent greater tuberosity, lies below the arch. In between these unyielding structures are the rotator cuffs, the intra-articular portion of the bicipital tendon, and the subacromial bursa. These are the shoulder structures most commonly involved in impingement syndrome (Figure 1).

**PATHOPHYSIOLOGY**

Impingement syndrome may develop when the available subacromial space is decreased or when its contents increase in size. Persistent impingement of the subacromial tissues provokes a local inflammatory response, partial tearing, and thickening of the rotator cuff. The bursa may also be irritated with resultant thickening of their walls, accumulation of fluid, and adhesion formation (11). Continued repetitive trauma causes scarring, tendinitis, muscular trigger points, and ultimately progressive shoulder limitation (12).

This persistent irritation of subacromial periarticular tissues which causes space occupying effusion and synovitis is often due to the manner in which the upper extremity functions. Since the position in which the shoulder is used is in front of the body (22), the critical area for wear is centered on the supraspinatus tendon. When the arm is raised in the sagittal plane, the supraspinatus tendon passes directly under the anterior edge of the acromion, but impingement may also involve the long head of the biceps, subacromial bursa, and the acromioclavicular joint with other movements. Typically, these structures are not affected in isolation, but in combination.

**STAGES OF INJURY**

Impingement syndrome and its sequelae make up a complex disease group that Jobe (12) has divided into four stages. Stage I involves tendinitis, usually of the supraspinatus or bicipital tendon, often leading to a contracted or atrophied muscle. Stage II is characterized by fiber dissociation or fibrosis and thickening of the rotator cuff. Stages III and IV include tears in the rotator cuff and may require surgical correction. Since conservative care can be successful during the first two stages, it is imperative to intervene before the pathology progresses.

**BIOMECHANICAL CONSIDERATIONS**

**Scapulohumeral Rhythm**

Evaluation of normal shoulder arthrokinematics requires thorough and systemic assessment of all four shoulder joints involved in scapulohumeral rhythm. To evaluate scapulohumeral rhythm, observe shoulder elevation in the "scapular plane" which is 30° to 45° anterior to the coronal plane (13). In this plane the inferior part of the glenohumeral capsule is not twisted and the deltoid and supraspinatus are optimally aligned for elevation of the arm. Observance of arm elevation should reveal a coordinated, synchronous pattern of movement. In the initial 30°-60° the scapula can oscillate in a medial or lateral direction seeking a position of stability. Beyond 30 degrees of elevation, there is a wide range of scapulothoracic to glenohumeral ratios which can be considered within normal limits (1.25-2.34:1) (5,6,9,25). The ratio is often dependent upon the plane and arc of elevation, the resistance at the arm, and individual anatomical variations (24).

If scapular movement dysfunction is visibly detected, attention must be turned to the specific joints concerned. The 60 or so degrees of scapular movement on the
posterior thorax is allowed by a combination of sternoclavicular and acromioclavicular articular contributions (18). The sternoclavicular joint provides clavicular elevation during the first 90 degrees of overhead motion, while the acromioclavicular joint contributes to clavicular elevation at both the initiation and end range of overhead elevation.

Glenohumeral Osteokinematics

The humeral head goes through a process of rolling, gliding, and rotation at the joint surface during elevation (13). In the first 30-60 degrees of elevation, the humeral head moves approximately three millimeters superiorly in a rolling or gliding manner (25). Beyond 60 degrees of elevation there should be minimal displacement of the humeral head indicating pure rotation of the humeral head on the glenoid surface. All of these accessory motions must be available for normal elevation and should be manually evaluated as they are not under the athlete’s voluntary control.

Of primary importance is the inferior or caudal glide motion of the humerus. It can be checked by stabilizing the scapula and providing a distraction force along the humerus. As the force is applied, there should be a gapping under the acromion as the humeral head moves distally. If you're unsure about the quality and quantity of movement, compare it against the opposite extremity. Glenohumeral anterior glide is also an important involuntary accessory motion. It occurs concurrently with humeral external rotation and assists the greater tuberosity to slide under the acromion during elevation.

Postural Concerns

Faulty posture in the cervicothoracic area can cause a mechanical deformation of tissues in shoulder complex. A posture of forward head, rounded shoulders, abducted scapulae, and increased thoracic concavity may lead to a limitation of arm elevation range. The restriction is due to the altered starting position for overhead elevation. Scapular abduction causes an increase in acromioclavicular compression, lowering of the coracoclavicular tend, posterior slide of the sternoclavicular joint, and increased humeral internal rotation (3). All of these factors can create an environment in which impingement is more likely to occur.

ASSESSMENT

Subjective History

The examination of the shoulder begins with a subjective interview. This includes the date of onset and suspected mechanism of injury. Impingement syndrome is defined as insidious and gradual onset and usually without a single or specific traumatic event. This form of trauma usually develops over four to six weeks and the athlete describes the pain and limitations as “having come on gradually.” Hand dominance, previous history, and the success or failure of previous treatments are also important considerations during the subjective interview.

The location, nature, severity, consistency, and timing of the pain should be precisely evaluated. Later, palpation and crepitation findings can be correlated with the athlete’s pain description. Ask what activities aggravate and/or relieve the symptoms. The usual clinical presentation is a “deep” and poorly localized pain made worse by activity of the arm in the overhead position. Night pain and difficulty lying on the affected side are also commonly reported.

PHYSICAL EXAM

Range of Motion and Flexibility Assessment

The objective evaluation begins with a careful measure of range of motion of the involved and uninvolved extremities. A decrease in range of motion or loss of flexibility may be considered important according to the symptoms presented and the type of sport in which the athlete participates.

Pectoral flexibility and anterior capsule extensibility represented by range of motion in flexion, abduction, and external rotation is closely assessed. Shortening of these structures can approximate the acromion and the humeral head which decreases the suprachromeral space and consequently alters joint mechanics. Pectoral tightness leading to humeral internal rotation contractions may also cause increased frictional wear on the bicipital tendon in the bicipital groove (3).

Measure external rotation range of motion at 90°, 135°, and 180° of abduction. Generally, rotation of the humerus is progressively diminished as abduction range increases. At 90° of abduction, passive external rotation range of motion should approach 140° in throwing athletes. It is not unusual for these athletes to have increased external rotation, but they will have concomitant decreases in internal rotation range of motion and still have only 140° (1).

Posterior rotator cuff and posterior deltoid flexibility can be checked with horizontal adduction and mild elbow flexion at 90 degrees of elevation. Full range of motion in these structures is important to the follow through phase of throwing and racquet assisted motions.

Palpation may reveal myofascial dysfunction in the levator scapulae resulting in tightness or contracture that puts the glenoid in a relative position of downward rotation and may also restrict forward elevation (28).

Muscular Function Assessment

All of the rotator cuff muscles should be active throughout arm elevation. They provide the necessary force couple to maintain the humeral head at its center of rotation (18). The rotator cuff by its line of attachments acts specifically to depress and rotate the humeral head during flexion and abduction (18).

In some athletes, impingement syndrome is not related as much to anatomical structures as it is with relative deficiency in rotator cuff muscular function. Saha (27) labeled the rotator cuff as “steerers”, stating that these muscles are mainly responsible for the rolling of the head of the humerus in the glenoid fossa. If the deltoid works in isolation or dominance in the initiation of elevation, superior migration of the humeral head and impingement against the acromion results.

Assessment begins with palpation and observance for atrophy or asymmetrical tone. Specific evaluation of the supraspinatus, infraspinatus, and teres minor can be accomplished with manual muscle testing. The supraspinatus is isolated in the “empty can” position of 90 degrees abduction, 30 degrees horizontal adduction, and full internal rotation (12). Muscular function of the teres minor and infraspinatus can be assessed with resistance to external rotation at 90 degrees of abduction.

Because scapular rotation is necessary to overhead motion, evaluation of the upward rotation function of the serratus anterior and trapezius should also be included. The serratus anterior and trapezius act as a force couple to upwardly rotate the scapula (29). This function enables the glenoid to remain in firm opposition to the humeral head and maintains the optimal length-
tension relationship for the deltoid. Serratus function is evaluated by observing for winging during extremity weight bearing posture or in a motion of abduction (15). Consideration should be given to the concentric, eccentric, and endurance parameters of these muscles. The ability to repetitively maintain humeral head control during overhead activity is the key to symptomatic control. If the external rotators fatigue prematurely, pathomechanical breakdown is eminent. A recent study evaluating shoulder pain in swimmers suggested that in a 240°/second, 50 repetition anti-gravity isokinetic external rotation test, the sensitive value for predicting potential impingement problems was 50% (21). Those swimmers with less than 50% endurance, as defined by total work at the end of the test compared to the beginning of the test, were the subjects who had shoulder problems. In subsequent testing on athletes at our clinic we have found that less than 50% external rotation endurance is a very common finding among patients suffering from impingement syndrome.

**TREATMENT**

**Acute Care**

In the acute phase of treatment, standard care should include ice, anti-inflammatory agents, rest from aggravating activities, and Grade I and II mobilizations. Active range of motion within protected ranges and under the pain threshold may be started during this time. Strict immobilization should be avoided following this type of injury due to its deleterious effect on articular cartilage health, ligamentous tensile capabilities, and muscular enzyme function (23). Gentle Grade I and II oscillations provide a neurophysiological “gating” effect by stimulation of the mechanoreceptors present in the synovial joint capsule (4,31). Modality application during this phase to supplement resolution of inflammatory symptoms requires proper positioning to expose specific portions of the rotator cuff. Ice massage, pulsed phonophoresis, or iontophoresis are more successful when applied to the precise area of pathology.

Glenohumeral adduction and internal rotation, which places the hand behind the back, brings the supraspinatus tendon out from under the anterior edge of the acromion (10). The posterior portion of the cuff is made accessible by external rotation and horizontal adduction (10). The supraspinatus and infraspinatus are now palpable just inferior to the posterior acromion. The subacromial bursa will slide forward under the acromion with shoulder extension and mild external rotation (8).

When the athlete is resting or being treated, place the shoulder in mild flexion and abduction by placing a pillow support between the trunk and arm. This places the subacromial structures in a position in which vascularity to the rotator cuff is ensured. Also during the acute phase, emphasis should be placed on general conditioning with alternative activities. This may be a time to work on components of the sport which do not require prolonged or repetitive elevation. For instance, the tennis player may work on ground strokes and agility drills rather than overhead serves and smashes.

Although this phase may last from days to months, most athletes will respond favorably to this protocol and experience a decrease in symptomology (11). However, if flexibility, strength, and biomechanical deficits are not identified and corrected, pain will return as unrestricted athletic participation is resumed.

**EXERCISE REHABILITATION**

In most cases, a careful history and detailed physical examination will precisely define the specifics of the exercise rehabilitation program. Mobilizations to restore normal joint mechanics, stretching to increase range of motion, and strengthening to improve muscular control are all important components of the program.

**Mobilizations**

Limitations or restrictions in scapular mobility can be addressed through specific graded mobilization at the SC and AC joints. When glenohumeral caudal hypomobility is detected, graded inferior glide mobilizations are indicated (4). In the case of supraspinatus tendinitis it is preferable to manually apply this distal traction force in various positions of forward flexion and/or abduction. The microvasculature of the supraspinatus tendon is reduced in the neutral or resting adducted position (26). The critical zone is “wrung out” and will not allow the circulation necessary for healing. Oscillation in a caudal direction from an adducted position may also activate ballistic type loads on the supraspinatus tendon which may also be contraindicated.

A common exercise which provides anterior glide of the humeral head is the pendulum or Codman’s exercise program (3). This is a gravity assisted series of movements which puts traction on the humerus, stretches the capsule, avoids painful abduction and minimizes the shrugging type of scapular elevation. It serves as a very effective warm-up prior to other shoulder rehabilitation activities. If Codman’s exercises do not adequately increase anterior glide joint play, then specific mobilizations with the scapula stationarily fixed must be employed.

**Postural Training**

Postural exercises can be effective in correcting the sequela of increased kyphosis (15). These exercises should be designed to increase tonic strength in the rhomboids and trapezius and stretch the pectorals, latissimus, teres major, and serratus anterior (16).

Postural modification in daily activity may include lowering chair height and/or raising desk height to achieve a more upright position of the cervicothoracic spine. Positioning of the chair closer to the desk and the use of a lumbar roll will also help to prevent the rounded shoulder position.

**Stretching**

Flexibility enhancement, when indicated, should be sport specific and not encourage hypermobility. All stretching should be done in a gradual, easy, and painless manner with prolonged, but mild forces (30). Stretching exercises should address identifiable deficits in range of motion and be discriminately prescribed. Specific examples would include passive external rotation in 90, 135, and 180 degrees of abduction (Figure 2).

The inferior capsule is stretched with arm overhead and the elbow in extreme flexion. Placing the opposite hand on the elbow and the head into cervical extension provides a passive overstretch (Figure 3). Anterior deltoid stretching can be accomplished with gravity assisted horizontal abduction off the edge of a table in a supine position (Figure 4).

Pectoral flexibility is enhanced with a corner stretch. First with the 90/90 position to influence the horizontal sternal fibers of thepectoralis (Figure 5) and then in 135 degrees of abduction to stretch the clavicular portion of
Strengthening

Ideally, rotator cuff strengthening should be done in a position of abduction or forward flexion which mimics the athlete’s sport, does not aggravate the symptoms, and utilizes gravity as a form of resistance. Dumbell or surgical tubing resistance is preferred because it allows concentric/eccentric contractions.

Eccentric training improves the tensile properties of the posterior rotator cuff muscles which are necessary for the deceleration function in throwing and racquet motions. These violent contractions occur very rapidly and are necessary to slow down the force pulling the arm forward out of its socket. The deceleration phase also requires the scapula stabilizers to provide an anchor for rotator cuff function. The bicipital tendon is also contracting eccentrically during this time to slow down elbow extension which creates a stabilization force across the humeral head. Relatively low weights and a high number of repetitions are performed. A typical prescription of exercise asks for 5-8 sets of 10 repetitions with not more than 5-10 pounds of resistance (1).

Specific rotator cuff exercises include:

- With athlete prone and shoulder at 90° of abduction, extend and flex the arm. (Figure 9)
- With athlete prone and shoulder externally rotated, extend then flex the arm. (Figure 10)
- With athlete prone and shoulder in external rotation and 90-100° of abduction, horizontally abduct then adduct the arm. (Figure 11)
- With athlete standing and shoulder in mild external rotation, forward flex then extend the arm. This position emphasizes the long head of the biceps. (Figure 12)
- With athlete standing and shoulder in 90° of abduction, 30° of horizontal adduction, and full internal rotation, slowly lower then raise the arm through 45°. (Figure 13)

Primary accelerators in throwing and racquet sports can be strengthened with sitting dips (Figure 14). This is typically the only anterior shoulder muscle group

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**Figure 1.** Anterior Anatomical View of Area of Impingement

**KEY:**

- A = Acromion
- C = Clavicle
- SP = Supraspinatus Tendon
- CAL = Coracoacromial Ligament
- CP = Coracoid Process
- THL = Transverse Humeral Ligament
- H = Humerus
- SB = Subacromial Bursa
- BT = Bicipital Tendon
- SC = Scapula

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**Figure 2.** Passive External Rotation

Stretching at 180° of Abduction

**Figure 3.** Stretching of Inferior Glenohumeral Capsule

**Figure 4.** Stretching of Anterior Deltoid and Anterior Glenohumeral Capsule

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the pectoralis major (17) (Figure 6). Prolonged, static stretching of the scapula into upward rotation may increase soft tissue flexibility and enhance scapulo-humeral rhythm (Figure 7).

An aggressive stretch for the mildly symptomatic shoulder is the bar hang with the forearms supinated (Figure 8). This position allows the greater tuberosity of the coracoacromial ligament. Increasing the intensity of the stretch can be accomplished by increasing the degree of knee bend in a weight bearing position.
exercise that is used in the presence of impingement symptoms. The shoulder internal rotators, shoulder depressors, and triceps are all active in a concentric/eccentric fashion with this exercise. Serratus anterior exercise can be accomplished initially with wall push-ups that progressively move toward a more horizontal posture (2). In absence of symptoms, include serratus punches at the end range of a bench press motion emphasizes the lower digitations of the serratus which are of primary importance in overhead elevation.

RETURN TO ACTIVITY

Recognizing that speeds of motion may exceed 3000 degrees/second (19) in the throwing act and that these velocities, forces, and stresses cannot be duplicated in rehabilitation programs, the athlete must progress through a functional rehabilitation program specific to his or her sport before assuming full, unrestricted activity.

TRAINING ERRORS

The onset of impingement symptoms in a previously healthy shoulder usually follows an error in training. Training errors can be classified as overuse in frequency, duration, or intensity.

Frequency training errors are a result of increased number of workouts or repetitions within a specific time frame. Duration overuse occurs when an inappropriate or excessive amount of time per workout or game is spent in activity. Intensity training errors describe an increase or change in the type of resistance used in the workout. In order to prevent training errors, frequency, duration, or intensity should be increased by a maximum of 5%/week (7).

BIOMECHANICAL TECHNIQUE ERRORS

The last service that should be provided for the athlete who suffered from impingement syndrome is a thorough analysis of activity technique. The coach, athletic trainer, physical therapist, and kinesiologist may need to pool their skills and expertise to aid in the identification of potential problems.

In the tennis serve, watch for improper ball toss where the ball is thrown up too far behind and above the server. Note if there is improper follow through and failure to square up to the net. The “twist” serve with excessive glenohumeral internal rotation should not be allowed (14).

In the throwing athlete, counsel against “opening up too soon.” When the pitcher attempts to whip the arm to create arm speed, the shoulder is left behind the body. As a result, the elbow is dropped to allow the shoulder to catch up (14). This improper technique will create abnormal forces anteriorly in the shoulder.

The swimming stroke should be closely evaluated in terms of body roll, hand placement, breathing patterns, and elbow lead (20). Hand paddles to increase pull through intensity and prolonged forward flexion shoulder positioning with the use of kickboards are usually not recommended for the swimmer with shoulder pain.

Movement in the glenohumeral joint and the accessory joints which contribute to shoulder elevation are designed to be smooth and coordinated. But even the slightest alteration in the balance and synchronization of this movement can lead to pain and limitation. It is within the athletic trainer’s domain to detect and correct the abnormal forces and stresses which are responsible for this type of injury.

References


A Tip From The Field

Media Center Taping Table

Phillip Hossler, MS, ATC

The taping and treatment tables in most high school training rooms often must serve a variety of functions as well as utilize space efficiently. My solution for a small (12' x 18') training room was to construct a table which is greater in width and shorter in length (42 x 50 in.) than standard taping tables.

The width of the table allows two or three athletes to sit beside each other and be taped simultaneously. It also provides ample room for single or double treatments. This particular table has several unique features. The first is the table top surface. Since the majority of the table is made from standard \( \frac{1}{2} \) in. plywood, the prevention of an athlete picking up a splinter was paramount. To prevent the athlete from coming in contact with the plywood edges, the table is covered with a single piece of \( \frac{1}{4} \) in. plexiglass with edges filed smooth. The plexiglass is secured to the table top to prevent slippage by 2 in. flathead bolts (acting as cotter pins) placed within a hole drilled through the plexiglass and table top in each back corner. A piano hinge would also work very well.

By removing the flathead bolts, the plexiglass can be lifted, allowing sports schedules, current newspaper articles, student trainer announcements, practice schedules and team or individual pictures to be placed under this cover (Figure 1). In addition, information related to injuries, treatments, and anatomical drawings can be read by injured athletes receiving treatments on this table.

Another unique feature owing to the oversize of the table, is that the drawers and cupboards provide exceptional storage space. The drawers in the center one-third of the table measure 39 in. in length and vary in height from 6 to 10 in. The top drawer houses necessary taping supplies (Figure 1) while the bottom drawer (Figure 2) is divided into several compartments for items such as elastic bandages, moleskin, and insoles.

Phil Hossler is the athletic trainer at East Brunswick High School, East Brunswick, New Jersey. He is president of the National Interscholastic Sports Care Association and author of HANDBOOK OF ATHLETIC TRAINING.

Figure 1.

The cupboard doors on either side of the center drawers provide room for items such as 5-gallon coolers, foam rubber sheets, weights, ankle exerciser, towels and neoprene sleeves. The cupboard on the left side has a shelf which slides in and out and divides the compartment into halves. The cupboard on the right side is larger, measuring 14 x 31 x 38 in., and easily houses coolers and ice buckets (Figure 1).

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mounted. By using standard pegboard hooks, this side of the table provides a convenient area to hang scissors, tape cutters, extra shoelaces, informational packets or a tray for self-help items for the athletes (Figure 3).

In a larger room, this table could be placed away from the wall so as to become a taping island. Placing doors on both sides of the table would provide access to the cupboards from either side. The drawers in the center portion simply become one-half the width of the table so as to allow drawers on both sides.

This oversized, multi-functional media taping table was inexpensive to construct and has proven very useful in a variety of aspects of the daily workings within the training room. ©

Figure 3.
ABSTRACT: Mouthguards are a vital piece of protective equipment for any athlete participating in a variety of sports. The mouthguard acts as a shock absorber, helping to protect serious head and neck injuries. Mouth protectors may be divided into three types: the ready made or stock mouth protector, the mouth-formed protector, and the custom-made protector. These three types of mouth protection will be described in detail and the procedure for implementing custom-made mouthguards into an athletic program will be explained. Choosing the proper type of mouthguard for your athletic program is an important decision that could affect the safety of the athletes and should not be taken lightly.

It is no secret that a properly fitting mouthguard can be the most important piece of protective equipment that an athlete can wear. Along with preventing injuries to the teeth and soft tissues of the mouth, the mouthguard may also prevent serious head and neck injuries. The mouth protector reduces a force which could cause concussion, neck injuries and jaw fractures (5). Today the price of a mouthguard can range from under a dollar, to over fifty dollars for a well-fitting custom-made device. This article will give some insight into the different types of protectors available, and ultimately convince the reader that the use of the custom-made mouthpiece is the most beneficial and pleasing for the athlete to wear.

A need for some type of mouth protection was first addressed in 1960, when the American Dental Association and the American Association for Health, Physical Education and Recreation teamed up to deal with the issue of mouth protection for athletes (3). This joint commission later published a report that confirmed the need for athletic mouth protection. In 1962, face guards and mouth protectors became mandatory for football players of the National Federation of High School Association, the National Association of Intercollegiate Athletics, and the Junior College Athletic Association (3). A short time later the National Collegiate Athletic Association adopted a mouth protection rule (3). The results of these actions have been outstandingly successful. The number of mouth, head, and neck injuries has been drastically reduced. The decrease in injuries spurred further technological advancements, and the overall effectiveness of the mouthguard improved. Mouth protectors may be divided into three types: the ready made or stock mouth protector, the mouth-formed protector, and the custom-made protector (5).

Stock or factory made protectors are unmodifiable guards that are made of blocks of rubber or plastic (4). The stock protector is obtained over the counter and does not require fitting (5). Although the stock protector does provide some protection, it is not considered an ideal protector because they are cumbersome and lack a form fitting design. They tend to fit poorly, are bulky, and can interfere with talking and breathing. Also, they can only be held in place when the jaws are closed (5). The financial savings that the stock protector may provide is not advantageous to the athlete.

The second type of protector, and most commonly used, is the mouth-formed protector. The two types of mouth-formed protectors are the shell-liner type and the thermoplastic device (5). The shell-liner type consists of a pre-formed outer shell of polyvinyl chloride which fits loosely over the maxillary teeth. The liner is plasticised acrylic gel or a silicone rubber which is mixed, poured in the shell, and placed into the mouth while it sets up in a few minutes (5).

A preformed shell is the second type of mouth-formed protector. This type is immersed in boiling water for 10 to 30 seconds. After this, the protector is placed in the mouth, where the athlete forms it by biting and using the fingers and tongue for adaptation. A guard of this type is usually made of a thermoplastic copolymer of polyvinyl acetate-polyethylene (5). Some of the advantages to the pre-formed shell are that they can be reheated and reformed easily. Also, this type of mouthguard is usually quite inexpensive, and can be bought and distributed in mass quantities. Finally, this type of guard usually comes with a strap that facilitates easy attachment to the faceguard. Some problems are that the athlete may chew on, or cut away vital parts of the protector. If this is done, protective qualities of the mouthguard are lost, and injury may occur. Bulkiness and difficulty in breathing may also hinder the athlete who wears this type of protector.

The final, and most effective, type of guard is the custom-made mouth protector. Custom-made mouth protectors are fabricated on a model of the athlete’s maxillary teeth by a dentist, or under the supervision of aalter the fit of the mouthguards. If done correctly the result is a high strength dental stone that displays an entire model of the teeth and surrounding soft tissue (5). This durable stone can also be saved and re-used if the need arises during the season. Some type of identification system should be placed on the dental stone. In the case of St. Ambrose University, an identifying number was placed directly on the dental stone. A master list subsequently contained the corresponding number and name of the athlete. The next step is forming the thermoplastic material on the model, which is usually done in a laboratory setting.
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A vacuum is normally used to form the thermoplastic material onto the model of the athlete's teeth. The material is first softened under a heating element. The vacuum is turned on and the softened mouth protector material centered on the model (5). After approximately two minutes, the material will be completely and evenly formed to the model. Another viable way to form the material onto the model is using compressed air (5). The compressed air method is similar to the vacuum method in that the thermoplastic material is still heated, and then formed to the model. After the guard has been formed to the model, it should be chilled for 60 seconds in cold water (5).

The mouth protector is finished by removing it from the model and trimming away the excess material 1/8 inch short of the labial fold with a pair of curved, surgical scissors (5). Clearance for the buccal and labial frenum areas, which are the muscle attachments of the lips and cheeks to the gums, should be provided by notching the protector in these areas (5). The protector is then replaced on the model and the edges flamed with an alcohol torch and smoothed with wet fingers to remove any irritating or rough edges (5). A final check should be made to determine that the thermoplastic material is smooth and even throughout.

The mouthguard should be periodically cleaned in soapy water. Also a daily rinsing with cool water will help to prolong its life (5). If possible, the protector should be stored in a strong plastic container, this will help prevent loss or damage to the protector.

At St. Ambrose University, the services of a team dentist and a local dental laboratory were donated in order to incorporate the custom-made mouth protectors to our program. A nominal fee was paid for some of the materials. Planning and organization was required to efficiently make impressions of the athlete’s teeth and pour them up in dental stone. The impression making process is usually the most time consuming, but accuracy in making the impression is vital for a well fitting mouthguard. The impression making process for football took four hours and for sports such as basketball and volleyball no more than two hours was required. Each athlete received two mouthpieces, and more could easily be made if the need arose.

At St. Ambrose University tremendous success has been found with the custom-made mouth protection program. The athletes enjoy the added protection, fit, and comfort that the custom-made protectors afford. Also, the improved breathing and speaking abilities seem to aid in overall athletic performance. Since the mouthpiece plays a vital role in any athletic sporting equipment, it would be a prudent decision for any coach or athletic trainer to investigate the practicality of custom-made protectors for their athletes. Improved safety and performance is the goal of every coach, athletic trainer, and athlete. The custom-made mouthguard can help achieve this goal and make participation a healthier and more enjoyable experience for the individual athlete.

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Altered Tennis Ball Exercises for Hand and Wrist Rehabilitation

H. Keith Owsley, MS, ATC

There are various types of exercises used for rehabilitation of the shoulder, elbow, or wrist. One of these exercises is the ball squeeze, which is simply done by having the athlete place a ball in the hand and squeeze. However, there are times when this is not so simply done. For example, when an athlete has just had a cast removed from the wrist he or she may have limited range of motion and not have the strength to fully squeeze the ball. To allow the athlete to obtain a full range of motion and rebuild strength, a series of altered tennis balls can be implemented.

The first stage involves using a tennis ball that has been cut in half (Figure 1). This provides resistance and allows the weakened muscles to squeeze the ball through a full range of motion. As the athlete’s strength progresses, switch the athlete to a tennis ball with a slit half way around it (Figure 2). This allows for more resistance while still allowing the full range of motion as the slit will allow the ball to gap out when squeezed. The ball should be placed in the hand so the gap is away from the palm of the hand (Figure 2). As the athlete reaches the final stage of rehabilitation use a regular solid tennis ball. At this stage the athlete should have the strength to squeeze the regular tennis ball without pain through the full range of motion (Figure 3). ©

Figure 1. Athlete squeezing half a tennis ball.

Figure 2. Squeezing a whole tennis ball with a slit in it.

Figure 3. Squeezing a whole tennis ball.

H. Keith Owsley is a Graduate Assistant at Illinois State University-Normal, Illinois and serves as the head athletic trainer at University High School-Normal, Illinois.
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Exercise Physiology

The question that continually arises in athletics is, when is an athlete “in shape” or how can an athlete’s potential be measured? One of the most fundamental beliefs in exercise physiology is that performance during maximum exercise of short duration is limited by the inability of the heart and lungs to provide oxygen at a rate sufficiently fast enough to fuel energy production by the active muscle mass (1). This assumption came from earlier studies by A.V. Hill and H. Lupton in the 1920’s. In recent studies it has been shown that through critical reviews of Hill and Lupton’s work they inferred but did not prove that oxygen limitation develops during maximal exercise. Also, recent studies have shown that if such an oxygen limitation does indeed occur during maximal exercise, it develops in about 50% of the test subjects. Thus alternative methods may need to be used in order to explain exhaustion during maximal exercise (1).

The reviews studied propose that factors limiting maximal exercise performance might be better explained in terms of a failure of muscle contractility (muscle power), which may be independent of tissue oxygen deficiency, and discuss other means of predicting athletic performance.

Probably the most used procedure in exercise physiology is the test for maximum oxygen consumption (VO2max). Judging from the frequency in most publications of the topic, it would seem that many athletes, especially runners, swimmers, triathletes, and cyclists believe the VO2max is the best predictor of athletic potential.

Reviews of Hill and Lupton’s work show they concluded that the constant oxygen consumption measured at the fastest running speed represented an apparent but not a true steady state on the basis, 1) of Hill’s feelings of fatigue during the run and 2) their interpretation of the meaning of the “oxygen debt” which they knew to increase after exercise in increasing intensity. Hill used his belief that oxygen limitation explained his fatigue as the basis for his argument that an oxygen limitation was indeed present (1).

Hill and Lupton didn’t provide any evidence that they had actually measured either the oxygen debt for muscle and/or blood lactate levels during these studies, even though this was concluded and proposed in a study published in 1924 (2).

In one study on renal transplant patients it was found that in their first maximal exercise test, the subjects showed evidence for a peripheral, not central, limitation to their exercise tolerance as their values for maximal heart rate, maximal ventilation, respiratory quotient, and peak blood lactate levels were low. Also, none showed evidence for a plateau in oxygen consumption with increasing exercise workload. During retesting after a training program, the subjects exercised for longer and reached higher values for maximum heart rate, ventilation, respiratory quotient, and blood lactate levels without a change in the lactate turnpoint, principally because they were more powerful and able to exercise to higher workloads. Thus the increase in the VO2max that developed with these subjects was from peripheral changes in muscle power and not likely due to central cardiovascular changes increasing oxygen delivery to the active muscles.

Care must be exercised in the interpretation of the VO2max results in people who initially have some muscle weakness which in turn will most likely alter with training.

A study by J.T. Daniels, R.A. Yarbrough, and C. Foster showed that changes in running performance with training occurred without much changes in VO2max. They concluded that “physiological adaptations not integrated in the test of VO2max ... contributed to training-induced improvements in running performance” (3). Similarly, D. L. Costill demonstrated that a clear dissociation of exercise performance, muscle power, and muscle oxidative capacity with detraining improved swimmers’ performances, whereas muscle oxidative capacity fell by up to 50% during the same period (4,5).

In summary, it is suggested that the primary variable in predicting athletic performance, at least in running, is the maximum speed or workload that can be achieved during a maximum test. Also, findings between a relationship between VO2max and total work output during maximal isokinetic exercise of 30 second duration suggest that skeletal muscle contractility differs between fast and slow runners and between runners with high and low VO2max values. Other suggestions made about predicting athletic potential are that the lactate turnpoint and the respiratory ventilation threshold (“anaerobic threshold”) can predict performance especially in races of 10-48 kilometers. In distance runners who have relatively similar VO2max running economy (RE), and ventilatory threshold (Tvent) and who are similar in size, their anaerobic system will establish the winning margin. This concept previously has been overlooked by many researchers. This concept, however, may not be valid when applied to those who are not aerobically matched. Further research needs to incorporate measures, including assessments of all three major energy producing systems (phosphagen, lactate, and aerobic) which contribute to athletic performance.

References

AOSSM Presents George Sullivan with 1988 Distinguished Service Trainer Award

George F. Sullivan of the University of Nebraska has been presented with the 1988 Distinguished Service Trainer Award by the American Orthopedic Society for Sports Medicine (AOSSM). He received the award during ceremonies held in June at the NATA Annual Convention in Baltimore.

A life-long resident of Nebraska, Sullivan began his career as an athletic trainer while still an undergraduate student at the University of Nebraska. After earning a Bachelor’s degree in Education in 1951, he became a trainer for the Philadelphia Athletics minor league clubs. He subsequently earned a Certificate in Physical Therapy from Iowa State University. In 1953 he returned to the University of Nebraska campus as a staff physical therapist and athletic trainer, and earned a Master of Arts degree in Educational Administration in 1974. Sullivan has worked for the University throughout his career, and in 1977 was made head athletic trainer, a post he still holds.

Sullivan has frequently been called upon for his expertise in athletic training. He served as a trainer for the Pan American Games in 1959, and was the head trainer for the Pan American team in the 1963 games in Brazil and the Pan Pacific Games in Canada in 1973. He was also selected to be a trainer for the Olympic Games in Mexico City in 1968.

George Sullivan is not only respected for his abilities as an athletic trainer, but also as an educator and innovator in the athletic training field. He has lectured frequently at various meetings of professional trainers, physical therapists and medical practitioners. He has written for professional journals and publications, including a manual on athletic training developed jointly by the American Medical Association and the NATA. Sullivan also produced three 90-minute athletic training films in conjunction with the Nebraska Educational Television Council for Higher Education.

Sullivan has taken a strong leadership role in maintaining a nationwide commitment to a high level of professional practice and service to athletes. He has held a variety of positions with the NATA, to include District Director, District Secretary, NATA Representative to NOCSAE, Sub-Committee on Certification, and Professional Advancement Committee. He currently is the chair of the Honor Awards Committee. Sullivan has also served in several capacities with the American Physical Therapy Association, the Nebraska State Medical Association, the Nebraska State Board of Health, and the American Society for Testing and Materials F-8 Committee. He also serves on the national boards of advisors for Nike, Inc. and Southern Athletic-Bike, Inc.

Sullivan has been recognized on numerous occasions for his accomplishments, including receipt of the NATA 25-Year Award in 1975. He was named Sportsman of the Year in 1980 by Lincoln radio station KFOR; he received the 1984 M.E. Sacksteder Award for Contribution to Physical Therapy Education in Nebraska; he has been made an honorary life member of the Nebraska Coaches Association; and he received the Special Merit Award for the Nebraska Football Hall of Fame in 1985. In 1987 he received the Nebraska State Athletic Trainers Association Athletic Trainer of the Year Award.

As part of the Distinguished Service Trainer Award, the AOSSM made a $2,000.00 contribution to the NATA in Sullivan’s name. The Award was created in 1982 through the cooperative efforts of the AOSSM and NATA. Recipients must have been previously elected to the NATA Hall of fame, helped improve the quality of athletic training practice, and made a national impact with their work. Previous recipients have been Pinky Newell, Otho Davis, Fred Hoover, William Linskey, Warren Morris and Don Pfeil. The Journal and the NATA take great pride in once more congratulating George Sullivan for this prestigious recognition.

(Acknowledgement is given to AOSSM for part of this text)

District News

District 2

• Cranbury Country Club, West Windsor, New Jersey was the site of the first annual Victor “Vito” Recine, ATC golf outing on August 16. The event is in memory of Vito Recine who was one of the pioneers of athletic training, serving as athletic trainer for Sayreville High School and Rutgers University and a member of the NATA Hall of Fame.

Outing organizers Jeff Middleton (South Plainfield H.S.), Ron Sebastiani (Steinert H.S.) and Phil Hossler (East Brunswick H.S.) reported that the event generated three hundred dollars in donation to the Miami Project to Cure Paralysis. Johnson and Johnson, Inc., co-sponsors, matched this donation and assisted to defray the costs of the tournament.

The Miami Project fueled by the paralyzing football injury to Marc Bouoniconi, son of professional football player Victor “Vito” Recine, has been recognized with the Arthur Ashe Courage Award. The Miami Project is seeking to provide research and education for spinal cord injury.
great Nick Buoniconti, is based at the University of Miami. Its goal since its creation in 1985 is to find a cure for spinal cord paralysis.

Vito's son, Robert, is also a football paralysis victim as a result of playing weight-class football at Rutgers University in 1974. Robert has been involved in the Miami Project since its beginning.

Winners in the golf tourney included: athletic trainers Andy Altman (Rutgers University), Phil Hossler (East Brunswick H.S.), and Joe Camillone (Trenton State College).

• The N.Y.S. A.T.A. is proud to announce the results of its 1988 executive committee elections. Rick Zappala, Hofstra University will assume the office of President after serving as President Elect the past two years. Steve Norman, Columbia University was elected President Elect and Jeannette Hathaway, Manhattanville College was elected Secretary Treasurer.

District 4

• The 1987 Certification Examination Achievement Award had two winners this year. The two individuals who earned the highest score on the NATA certification exam were James Penkalski of Kent State University and Paul Widner of Indiana State University. Plaques were presented to representatives of their schools.

• Omitted from the list of District Scholarship Award Winners in the Fall 1988 issue of Athletic Training was the name of Brenda Gailhouse. Brenda is a student at Ball State majoring in athletic training and biology, and she was awarded a Swede-O Universal Student Athletic Trainer Scholarship.

• 1988 Ohio Trainer of the Year Awards were presented at the annual spring meeting of the Ohio Athletic Trainers Association.

The winners as selected by their peers included: (left to right in picture below) High school: Bill Mohn, Head Trainer for Solon City Schools, Solon, Ohio; College: Billy Hill, Co-Head Trainer of The Ohio State University, Columbus, Ohio; Clinic/Professional: Gary Giffen, Director of St. Elizabeth Sports Medicine Center, Dayton, Ohio.

District 6

• The Southwest Athletic Trainers Association’s Annual Meeting was held July 21-23 in Arlington, Texas. The meeting was highlighted by the awards presentations. Allen Eggert, Head Trainer at Rice University and Al Wilson, Head Trainer for Killeen High School were inducted into the S.W.A.T.A.T.A. Hall of Fame. Richard “Dick” Vandervoort, long-time trainer with the Houston Rockets, was inducted to the Hall of Fame posthumously. Paul Zeek, Head Trainer at Lamar University received the Frank Medina Award and Pete Carlon, Head Trainer at the University of Texas at Arlington, received the Eddie Wojcik Award. Both of these awards are for outstanding service to the Southwest Athletic Trainers’ Association.

There were also three honorary memberships presented. They were presented to Dr. John Richard Anderson, team physician for North Texas University, Dr. J. Byron Landress, team physician for Garland High School and Dr. Ira Livingston, team physician for the Amarillo Public Schools. Honorary memberships are given to those who have given a great deal of time and service to the Southwest Athletic Trainers’ Association or have made significant contributions to sports medicine, the health care of athletes in the area, or to the athletic training profession.

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continued from page 331


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DISTRICT 1 & 2: JANUARY 8-10, 1989
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NATA Contact: Jim Gossett (212/280-3178)

DISTRICT 3: MAY 19-21, 1989
Cavalier Hotel
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NATA Contact: Robbie Lester (919/733-3822)

DISTRICT 4: MARCH 9-11, 1989
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NATA Contact: Roger Kalisiak (312/882-8006)

DISTRICT 5: MARCH 17-19, 1989
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NATA Contact: Jerry Weber (402/472-2276)

DISTRICT 6: JULY 27-29, 1989


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NATA Contact: George Young (817/565-2371)

DISTRICT 7: MARCH 10-12, 1989
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NATA Contact: Bill Lyons (307/766-2305)

DISTRICT 8: JUNE 30-JULY 2, 1989
Bally Hotel
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NATA Contact: Bill Chambers (714/879-5227)

DISTRICT 9: JULY 11-13, 1989
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NATA Contact: Drew Ferguson (205/934-1041)

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Abstracts

John Wells, PhD, PT, ATC


The knee is the most frequently injured joint in many sports, and knee injuries are the leading cause of long-term disability from athletics. Definitions of injury change with time, as do methods of diagnosis. Important advances made subsequently in the clinical understanding of knee motions and instabilities were aided by substantial progress in defining ligament properties, ligament function, and knee kinematics. The precise identification of isometric attachment points for various ligaments has been an important advancement. The long-term success of surgery on knee ligaments depends on proper identification of the abnormal knee laxity and of any anatomical defects that may be present. In the past decade, important gains have been made in the diagnosis of knee disorders. The most important advance in the diagnosis of knee-joint disorders has been arthroscopy. The importance of hemarthrosis of the knee was not known until it was clarified arthroscopically. Arthroscopic methods of replacing the anterior and posterior cruciate ligaments with autografts, allografts, or prosthetic ligaments have been developed. Many knee injuries that previously caused disability can now be diagnosed accurately and treated successfully. Early reconstruction is usually effective in restoring stability and improving function.


This study was designed to investigate the effect of ultrasound treatment on the recovery of nerve conduction in compression neuropathy of the tibial nerve in rats. Using a compression machine, the bilateral tibial nerves of 25 adult Sprague-Dawley albino rats (BW 200 to 350g) were compressed between the knee and ankle. The pressure applied was usually between 20 and 40 kg/cm² when the tibial nerve was blocked completely. This degree of compression was maintained for five minutes. One side of the leg was randomly selected for ultrasound treatment and the other side was used as a control. The treatment was given under water, three times per week, with the dose involving either .05 watt/cm² or 1.0 watt/cm² for one minute. There was also evidence of Wallerian degeneration in 10% to 15% of nerve fibers observed in the light microscope in a pilot study of 5 animals. Ultrasound deep heat treatment was found to have a therapeutic effect on the recovery of nerve conduction in compression neuropathy of the rat tibial nerve when a low dose (0.5 watt/cm²) was used. However, higher doses of ultrasound may cause a decrease in conduction velocity, or even a conduction block, caused by "overheating" of a mechanical effect. The mechanism by which therapeutic ultrasound enhances tissue regeneration is uncertain. Nerve regeneration may also be affected by a thermal agent, but the mechanism remains unclear. The results of this study are encouraging with respect to the development of ultrasound therapy for peripheral nerve lesion.

Betsy Nadler
UNC-Asheville


Anatomy and physiology combine to make the extremities particularly vulnerable to the dangers of compartment syndrome. If the pressure rises in one of the compartments - through trauma or hemorrhage, for example - serious muscle ischemia damage can quickly follow. The major effect of compartment syndrome is necrosis of the muscle caused by inadequate capillary blood flow. The pathophysiology of the compartment syndrome is unclear, but nonspecific trauma is the precipitating factor. Systematic complications of compartment syndrome can occur as a result of muscle wasting. The most common and important presenting symptom is deep, unrelenting, progressive, and/or poorly localized pain unrelieved by analgesics or elevation of the extremity. If neurovascular problems are suspected or if neuromuscular changes are noted, immediately remove all constricting dressings and bivalve any casts to alleviate any external pressure.

Brandi Schober
UNC-Asheville

REMINDERS TO NATA MEMBERS

• Membership expires December 31, 1988. If you have not yet returned the dues statement for your 1989 membership renewal, please do so right away to assure that your name stays on the mailing list to receive 1989 notices and the Spring Journal.

• Convention information packets will be going out early in 1989 and you don’t want to miss these either! Watch for complete Dallas coverage in the Spring issue.

• Communicate with the National Office: 1001 East Fourth Street, Greenville, NC 27858, (919) 752-1725.
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Book Review

Phil Callicutt, EdD, ATC

Beyond Training
Melvin H. Williams, Ph.D.
Box 5076
Champaign, IL 61820
1988
224 pages, Illustrated
Price: $10.95

More and more athletes at all levels of competition are turning to legal and illegal substances and treatments to improve athletic performance, even when such practices defy the ethics of sport. As sad as it is, there is not a week that passes without new headlines publicizing drug abuse in the athletic world, i.e., the NBA, NFL, and even the queen of athletic events, the Olympics, which started centuries ago on the premise of fairplay and sportsmanship.

Dr. Melvin H. Williams has researched such substances and treatments, commonly referred to as ergogenic aids, for the past 20 years. He also brings personal experience as a marathoner and former coach into play in this timely and well-written text.

By taking readers into the locker rooms and onto the playing fields, Dr. Williams shows how athletes are using everything from steroids to blood doping to baking soda in order to improve performance. The text is divided into seven interesting and easy to read chapters: Improving Sports Performance-Preliminary Considerations, Energy and Sports Performance, Nutritional Ergogenic Aids, Pharmacological Ergogenic Aids, Physiological Ergogenic Aids, Psychological Ergogenic Aids, and closes with a chapter on Mechanical and Biomechanical Ergogenic Aids.

"No banned ergogenic aid will be recommended in this book", Dr. Williams emphasizes from the beginning. Every text written on athletic training today has a section or chapter on ergogenic aids, but many stop short of providing the reader with good solid information and advice. Dr. Williams has completed the full circle and the reader leaves with the feeling that he or she has learned a great deal on this paramount and urgent modern day sports medicine problem.

I would like to strongly suggest that this text be considered required reading in our NATA approved curriculums. If every incoming freshman athlete read this text prior to entering school, many of our substance abuse problems would be solved. While traveling across this nation talking with athletes and sports medicine professionals, one basic fact always surfaces: athletes have information concerning ergogenic aids, but it is not always sound information, and more times than not, they have misinformation. The misuse of ergogenic aids can cost an athlete his or her career, reputation, or life.

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PLAN AHEAD!
- Dallas 1989 -
Calendar of Events

Jeff Fair, ATC, EdD, CCT

January

2-8  Sports Medicine “Recharge” Cruise. Contact Lynnea Johnson, College of Continuing Education, Northern Illinois University, DeKalb, IL 60115.

5-7  Annual Meeting of the National Association for Physical Education in Higher Education, San Antonio, TX. Contact Don Chu, Program Chair, Skidmore College, Saratoga Springs, NY 12866-0851.

8-10  District 1 & 2 Meeting. Kutcher’s Lodge, Monticello, NY (914/794-6000). NATA contact: Jim Gossett, 212/280-3178.

13-14  Third Annual 2-day Conference on Injury Prevention and Treatment Techniques in Baseball, Manhattan Beach, CA. Contact Pat Aycock, Kerlan-Jobe Orthopaedic Clinic, 501 East Hardy Street, Inglewood, CA 90301.

26-29  Ninth Annual Sports Medicine Conference, Lake Placid, NY. Contact Maureen E. Hanagan, Director, Continuing Medical Education, 233 Rowell Building, University of Vermont, Burlington, VT 05405.

February

18-25  Sixth Annual Office Based Sports Medicine Conference, Sun Valley, ID. Contact: University of California, San Francisco, Room 569-U, Extended Programs in Medical Education, San Francisco, CA 94143.

24-25  “Wellness in the Workplace”, Cleveland, OH. Contact Lynne Pender, Coordinator, Continuing Education, The Cleveland Clinic Educational Foundation, 9500 Euclid Avenue, Cleveland, OH 44195-5241.

March


10-12  District 7 Meeting. Little America Hotel, Cheyenne, WY (307/634-2771). NATA contact: Bill Lyons, 307/766-2305.


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Sprains & Strains
Sports Medicine Reporter

“I sprained by ankle when I . . .” “I strained my shoulder lifting . . .” We often use or hear these terms but what do they really mean? Is it better to have a sprain than a fracture (break)? How should they be treated?

Sprains and strains are similar as they both involve injury to fibrous supporting structures of the body. A sprain is a tear in a ligament. Ligaments are fibrous bands with join together and run from one bone to another. Strains involve tendons which are fibrous bands which join together and run from one bone to another. Strains involve tendons which are fibrous (The major difference it that if a tendon heals a bit “loose,” the muscle can tighten it, but a loose ligament can produce permanent problems.) Ligament tears or sprains are medically classed as Grade I, II or III. A Grade I injury produces some local pain and swelling but usually not enough to seek medical treatment. Grade II runs from moderate pain and no looseness to just short of a complete rupture. Grade III is complete separation of the ligament.

To understand treatment, the structure of the ligaments must be understood. They are composed of bundles of fibers roughly parallel to each other. (Blood vessels run between bundles to carry nutrients.) When too much force is applied, the fibers begin to snap, but not all at once. How many fibers snap determines how severe the injury is. (A ligament may look and feel normal except for being painful, when it has lost 80% of its strength.) Weakened ligaments must be protected or more tearing will take place. While 6-8 weeks will see good strength returned, as much as a full year is required for 100% strength to return.

What treatment is best then? Obviously, ligaments which are badly torn must be protected with casts or braces and may even require surgery. In less severe injuries, goals are to relieve swelling and pain and return protected use as soon as possible.

Ice and compression are the first steps. They minimize inflammation which would lead to more scar tissue. Careful therapy and exercise produce new fibers which are parallel, and therefore stronger. Many ligament injuries will lead to a loss of muscle reflex so that muscles will not respond fast enough to enable more rapid return to activity.

Ligaments and tendons are tough and strong but without them you would fall apart. Treat them with respect. Don’t say “it’s just a sprain . . .” If it swells much, hurts more than a day or two, or turns “black and blue,” have it checked out.

Calcium As Estrogen Supplement Seen Ineffective On Osteoporosis
P. T. Bulletin

Should women throw away their much-advertised calcium supplements? Not yet. But new research on osteoporosis has shown that calcium supplements given along with estrogen replacement therapy in post-menopausal women do not provide any extra protection against osteoporosis.

In a two-year study in Denmark, 66 healthy post-menopausal women (average age, 51) were randomly treated with various daily doses of estrogen, alone or combined with daily supplements of either 1,000 or 2,000 milligrams of calcium carbonate. A control group of 25 women received a placebo. The women’s skeletal bone mineral content and rate of bone loss were measured every three months.

Women who were not treated with anything experienced significant bone loss. Calcium treatment alone prevented some bone loss in the women’s forearms but not in their spines. And though estrogen therapy was effective in preventing further bone loss, the beneficial effect was not enhanced by calcium supplements.

“This does not mean that postmenopausal women who are taking estrogen should not have a sufficient amount of daily calcium,” emphasized researcher Bente J. Riis, MD, reporting at the recent International Symposium on Osteoporosis in Denmark.

“Rather, what these data suggest is that around the time of menopause, a reasonable calcium intake—500 or 1,000 milligrams a day—is sufficient if women are taking enough estrogen. More calcium than that is not going to help prevent bone loss any better.

The Nutritional Gender Gap
Good Health Digest

A young couple eats out. He gobbles up a steak, baked potato, salad, two dinner rolls, and apple pie a la mode. She eats half of her chicken and a salad, knowing full well that dessert is out of the question.

Let’s face it, men can eat more than women—they are larger so they burn off more calories. But there’s more to it. The weight women put on contains proportionately more fat; for men that weight contains more lean body tissue. So if a woman and man gain the same amount of weight, she will appear to have gained more.

Clearly, women must be extra cautious. According to the Food and Drug Administration, the older a woman gets, the fewer calories she needs to maintain her weight. When she passes menopause, her energy requirement is about 15 percent less than when she was in her 20s, yet her nutritional requirements are the same.

The recommended daily intake for women aged 23 to 50 is 1,600 to 2,300 calories. For men, that recommendation is 2,300 to 2,700 calories. Just another one of life’s little inequities.

Little League Teams Get New Face Guards
Prevent Blindness News

The I Care Auxiliary of the Northern California Society presented 30 face guard helmets to two Little League A-Teams in Menlo Park. The donation of the face guards kicked off their campaign to make children aware that serious eye injuries can be prevented by wearing proper sports safetywear.

“We were afraid they wouldn’t like them, that they wouldn’t wear them,” said I Care President Sally Newman. “But that wasn’t the case. As soon as they saw the helmets, they fought over who was going to put one on first.”

The A-Team members are 8-and 9-year-olds who have advanced from T-ball to hard ball.
The helmet, which is recommended by the National Little League, has a protective impact resistant eye guard. Use of the face guard helmets in baseball has been shown to dramatically cut down on the number of eye injuries, noted Newman.

**Predictions For The Year 2000**

*Feel Good*

When medical researchers gaze into the future, they come up with some interesting predictions. Louis Harris polled over 200 world-class researchers as part of a study on medicine in the next century.

Here are some of the more “startling” predictions for the year 2000, according to Modern Maturity:

- Diseases most likely to be eliminated are AIDS and measles, followed by polio, malaria, hepatitis, and cancer.
- Doctors will be able to cure two out of three cancer patients, and there will be a vaccination against certain types of cancer.
- The practice of traditional psychoanalysis will virtually disappear in favor of increased drug therapy.
- Artificial devices will be more common. There will be implantable hearing aids, implantable pumps to deliver drugs, and artificial blood and bones from bone banks.
- The common cold will remain incurable.

**Spices To Burn Calories**

*Good Health Digest*

Eye-watering foods such as jalapeno peppers, chili, and hot mustard may increase the rate at which your body burns calories.

Researchers at Oxford Polytechnic, London, measured the metabolic rates of individuals who ate identical meals over a period of several days. On alternate days, however, three grams of chili and three grams of hot mustard were added to meals. Comparing the individuals’ metabolic rates three hours after the meals, the researchers found that, on average, 45 more calories were burned on the days that hot spices were added. That may not create a great weight difference, but it’s a start.

---

**“A Psalm of Jogging Life”**

*Fitness News*

Tell me not in mournful numbers
Jogging is but an empty dream!
For the body wastes that numbers,
But jogging keeps it strong and lean.

Life is real. Life’s a custody;
An early grave is not our goal.
Care taken of the body,
Is taken also of the soul.

Not indolence and not dullness
Is our destined end or way,
But to jog, that each tomorrow
Finds us more active than today.

Life is brief and health is fleeting,
And our hearts need workouts to save.
Like muffled drums, they are beating
Funeral marches to the grave.

In the world’s broad field of battle,
In the bivouac of life,
Be not like dumb, plodding cattle!
Jog joyfully into the strife!

Trust no regimen however pleasant!
Diet and rest alone betray so,
Jog, jog in the living present,
And learn to feel God’s joyful glow!

Lives of great men all remind us
We can make our lives sublime,
And departing leave behind us
Nikeprints in the sands of time.

Nikeprints that perhaps another
Jogging through life’s stress and strain,
A wearied and winded brother,
Seeing, shall jog along again.

Let us then be up and jogging,
With vibrant health our goal.
Still achieving, still improving,
Exercise, diet, and stress control.

by H. Longfellow and O. McClain
Houston, TX, August 1986 ©
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Certification

Schedule of Sites and Dates

All regional sites are subject to a minimum of six candidates per site and limited to a maximum of forty candidates. Completed applications must be received by the Certification Office within the prescribed deadline for the examination date chosen.

**January 22, 1989** — Deadline for the receipt of application is December 16, 1988 at 5:00 pm E.S.T.

Boston, MA
Chenery, WA
Chicago, IL
Columbia, SC
Costa Mesa, CA
Fort Worth, TX
Granville, OH
Huston, TX

**May 21, 1989** — Deadline for the receipt of application is April 14, 1989 at 5:00 pm E.D.T.

Albuquerque, NM
Anderson, IN
Chicago, IL
Columbia, SC
Costa Mesa, CA
Denver, CO
Fort Worth, TX
Houston, TX
Kansas City, MO
Lexington, KY
Mechanicsburg, PA
Minneapolis, MN
Montclair, NJ
New Britain, CT
Omaha, NE
Portland, OR
Santa Clara, CA
Seattle, WA

**July 9, 1989** — Deadline for the receipt of application is June 2, 1989 at 5:00 pm E.D.T.

Boston, MA
Birmingham, AL
Claymont, DE
Costa Mesa, CA
Dayton, OH
Denver, CO
Edinboro, PA
Eugene, OR
Greensboro, NC
Kansas City, MO
Madison, WI
Mt. Pleasant, MI
Omaha, NE
Santa Clara, CA

**November 19, 1989** — Re-Exam only — Deadline for the receipt of application is October 13, 1989 at 5:00 pm E.S.T.

Albuquerque, NM
Anderson, IN
Costa Mesa, CA
Greenboro, NC
Kansas City, MO
Madison, WI
Mechanicsburg, PA
Nashville, TN
New Britain, CT
Seattle, WA
Continuing Education

The Board of Directors of the National Athletic Trainers' Association, Inc. at the June, 1988 Board meeting in Baltimore, Maryland approved the Continuing Education Committee's request to delete the Continuing Education Requirements for the Associate and Graduate Student (4B) members of our Association. This action is retroactive to January 1, 1988. Therefore, as an Associate or Graduate Student (4B) member you no longer are required to report Continuing Education Units.

In the future only Certified members will be required to maintain Continuing Education Units.

If you have any questions regarding this action contact the National Office.

CONTINUING EDUCATION REQUIREMENTS AND APPEAL PROCESS FOR THE CERTIFIED ATHLETIC TRAINER

Units of Continuing Education shall be approved by the Continuing Education Committee of the National Athletic Trainers' Association, Inc. Where it is applicable, the Continuing Education Unit (CEU) will be adopted as the unit of measurement to meet the Continuing Education requirements of the Certified Athletic Trainer of the NATA. The Continuing Education Unit (CEU) is defined as “ten contact hours of participation in an organized Continuing Education experience under responsible sponsorship, capable direction, and qualified instruction” (10 contact hours = one CEU).

To maintain Certification the minimum number of units to be accumulated each three (3) year Continuing Education period shall be 6 CEUs. Those Certified within the 3-year period shall have their CEU requirement prorated for that period only. The CE report periods are January 1, 1985 through December 31, 1987; January 1, 1988 through December 31, 1990; etc.

THE CERTIFIED ATHLETIC TRAINER is responsible for sending to the Continuing Education Office proof of completion of any Continuing Education Units (CEUs) and activities to be used in updating his/her record in a required period of THIRTY DAYS after completing the activity.
THE CERTIFIED ATHLETIC TRAINER who does not accumulate the required number of CEUs during the designated 3-year period shall have his/her name turned over to Membership and Certification for appropriate action. Any action taken affecting the status of a Certified Athletic Trainer relating to Continuing Education may be appealed to the Board of Certification (Please refer to the Appeal Process section).

Certified Athletic Trainers serving as members of the Armed Forces may request (in writing) a waiver of CEUs during their tour of active duty. The request will be granted at the discretion of the Continuing Education Committee. This waiver would apply only to time spent stationed overseas.

Certified Athletic Trainers who are not members of the NATA, Inc. should consult the Board of Certification Office for the recording of their CEUs and appropriate fees.

The Continuing Education Committee has developed the following definitions of acceptable Continuing Education for Certified Athletic Trainers:

A. NATA ANNUAL MEETING AND CLINICAL SYMPOSIUM: 2 CEUs for registration and attendance of each annual meeting.*

B. SCIENTIFIC WORKSHOPS OFFERED AT NATA ANNUAL MEETING AND CLINICAL SYMPOSIUM: 1 CEU for every 10 contact hours of workshop. (1 contact hour = .1 CEU).*

C. NATA DISTRICT MEETINGS: 1 CEU for every 10 contact hours will be awarded for the scientific program content offered at the District Meeting. (1 contact hour = .1 CEU.)

D. SHORT TERM COURSES AND SCIENTIFIC MEETINGS: Clinics, workshops, seminars, or NATA approved courses, etc., endorsed by the Continuing Education Committee. One CEU will be awarded for every 10 contact hours. Maximum of 2.0 CEUs per meeting. (1 contact hour = .1 CEU.)

E. PUBLICATION OF ORIGINAL WORK: Publication of an original paper in the NATA’s quarterly publication ATHLETIC TRAINING will be awarded 1.5 CEUs per original paper. One CEU will be awarded per original publication in a state or national scientific journal or publication of a related professional organization. Newspaper/newsletter articles awarded .5 CEUs.

F. PROGRAM PARTICIPATION AT STATE, DISTRICT OR NATIONAL MEETINGS: Credit units will be awarded for the presentation of an original paper or program participation at State, District or National level NATA meetings. One CEU will be awarded per meeting.

G. PROMOTION OF ATHLETIC TRAINING: The presentation of athletic training, or any aspect thereof, to organizations, school groups, civic groups, etc. will be awarded .5 CEUs per meeting. This also includes participation in workshops/seminars/symposiums as a speaker.

H. TEACHING OF ATHLETIC TRAINING COURSES: .5 CEUs will be awarded for each credit hour of actual teaching that is not a part of your job description, not to exceed 2 per year.

I. STUDENT TRAINER SUPERVISION: (inclusive of high school trainers). .5 CEUs per year will be awarded for supervision of a student trainer program for a full calendar year. If more than one Certified Athletic Trainer is supervising the student trainer, each receives equal credit.

J. POSTGRADUATE STUDY: Any study completed after receiving a Bachelors degree may be submitted for consideration by the Continuing Education Committee. The study must be related to improving one’s Athletic Training skills and/or knowledge. There will be .5 CEUs awarded for each credit hour accepted, with a limit of 2.0 CEUs per year to be accompanied by a copy of the transcript and course description.

K. CORRESPONDENCE COURSES: Correspondence courses in ATHLETIC TRAINING, The Journal of the National Athletic Trainers Association, Inc. will be awarded .3 CEUs per course. Correspondence courses offered by other publications related to Athletic Training will need to be approved in advance by the Continuing Education Committee. All courses approved by the Continuing Education Committee will require an examination that certifies the satisfactory completion of the course.*

L. OTHER NATA ACTIVITIES:

1. Serving as a National or District Officer in the NATA will be awarded one CEU per year.*

2. Committee membership in the NATA at the National level and/or District level will be awarded one CEU per year. An additional .5 CEUs each year will be awarded for the chairmanship of the committee.*

3. Certification testing. Those members participating in the certification examination will be awarded .5 CEUs per testing date.*

4. Examiner Development Workshop. Completion of an NATA Certification Examiner Development Workshop will be awarded .3 CEUs.*

5. Official liaison activity. Those members participating in the capacity of a liaison for the NATA will be awarded .5 CEUs each year.

6. State Organizations. Those members serving as elected officers or committee chairpersons in a formally organized State Athletic Trainers organization recognized by the NATA shall receive .5 CEUs for each full calendar year served in that capacity. This would include those committee persons officially designated as working toward state licensure.

7. Visitation team members doing curriculum evaluations shall be awarded .5 CEUs per visit not to exceed 1.0 CEUs per year.

M. TAPES AND CASSETTES OF PROCEEDINGS: Purchase of audio cassette
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tapes from NATA will earn .1 CEU per tape acquired. Proof of purchase is necessary to receive credit.

N. SPECIAL PROJECTS AND CONSIDERATIONS: All projects and educational activities must be submitted to the Continuing Education Committee District Representative for consideration. Projects such as development of, or participation in films, radio conferences, television programs or other audio-visual aids that may be used as a teaching aid or for public relations in the field of athletic training will be awarded .5 CEUs per project. Preparation and presentation of scientific athletic training exhibits at the local, District or National level: Limit .5 CEUs per exhibit. Current CPR and First Aid is creditable for .5 CEUs per year. Teaching CPR and First Aid is also creditable for .5 CEUs per session taught. EMT is creditable for up to 1.0 CEUs per Continuing Education period.

O. U.S.O.C. ATHLETIC TRAINING SERVICES: Any Certified Athletic Trainer who volunteers two (2) weeks service to any United States Olympic Committee sponsored training center will be awarded 2.0 CEUs. U.S.O.C. will validate CE credit to the National Office in December of each year.

*CEUs for categories A, B, K, L-1, L-2, L-3 and L-4 are automatically recorded and do not require individual reporting.

PLEASE REFER ALL QUESTIONS CONCERNING APPROVAL OF CEU PROGRAMS TO YOUR DISTRICT CONTINUING EDUCATION REPRESENTATIVE, ALONG WITH A SELF-ADDRESSED STAMPED ENVELOPE.

APPEAL PROCESS

The Certified Athletic Trainer will receive an annual statement showing the number of CEUs accumulated. CEUs earned in excess of requirements for the current period cannot be credited to the next recording period.

If a Certified Athletic Trainer has not earned, reported, and had recorded the appropriate number of CEUs for the current period, his/her name will be turned over to Membership and Certification for appropriate action.

A Certified Athletic Trainer who fails to accumulate sufficient CEUs will receive notice that his/her name has been turned over to Membership and Certification. The Certified Athletic Trainer may appeal this action.

An appeal may be filed by notifying the Board of Certification IN WRITING WITHIN SIXTY DAYS of the receipt of such notice. The appeal should be sent to the following address:

Committee on Continuing Education/Appeal
1001 East Fourth Street
Greenville, NC 27858

National Athletic Trainers Association, Inc.
Continuing Education Committee
James B. Gallagasy - Chairperson
University of Southern Mississippi
P.O. Box 5105
Southern Station
Hattiesburg, MS 39406-5105
(601) 266-5577

DISTRICT REPRESENTATIVES

DISTRICT 1
Connie Bauman
Wellesley College
Mary Hemenway
Wellesley, MA 02181
(617) 235-0320, Ext. 2023

DISTRICT 2
Don Kessler
Rutgers University
Athletic Training Center
Piscataway, NJ 08854
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DISTRICT 3
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Athletic Department Box 8501
Raleigh, NC 27695-8501
(919) 737-2011

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Hazelcrest, IL 60429
(312) 335-1415

DISTRICT 5
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3333 184th St.
Bettenard, IA 52722
(515) 332-7001, Ext. 265

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Arkansas State University
P.O. Box 1225
State University, AR 72467
(501) 972-3342

DISTRICT 7
Patty Curtis
Northern Arizona University
Box 15400
Flagstaff, AZ 86010
(602) 523-4151

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Dan W. Bailey
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Long Beach, CA 90840
(213) 430-5794

DISTRICT 9
Linda Arnold
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Athletic Office Building
Memphis, TN 38152
(901) 454-2340

DISTRICT 10
Jackie Smaha
P.O. Box 9645
Moscow, ID 83843
(509) 332-1919

NOTE: All CEU requests should be sent directly to the National Office. Workshop, seminar, and/or course pre-evaluations should be sent to the Representative in whose district the event is to take place.

870901

Journal

NATA members are reminded that until such time as the National Business Office of NATA is moved from Greenville, they should continue to transact Association business through the Greenville office (i.e., Certification, Continuing Education, Membership updates, address changes, etc.). The Winterville office handles Journal advertising, production and non-member subscriptions.

Journal Replacement Policy

The Policy for handling claims for missing Journals due to address change is based on the stipulation that the notice of change of address be received in the National Office at least 30 days prior to publication, in order for the member to receive a gratis replacement Journal. If the member did not meet the “30 day” requirement, or did not authorize the post office to forward Second Class mail, then the responsibility for not having received the Journal rests with the member and a minimum replacement charge is made. New
members and Reinstated members do not receive back issues published before their membership was validated. New members will receive the first issue published after NATA membership is in effect. Reinstated members (previously deleted due to nonpayment of dues) will receive the first issue published after confirmation of reinstatement is issued from the Membership Office. NATA members who do not receive their Journals should check with the Membership department of the National Office to determine if the membership roster reflects an incorrect address.

Thanks

The Journal Committee would like to express thanks to a number of people who have assisted Ken Knight with his editorial duties.

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Indianapolis, IN

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CEU REPORT FORM
National Athletic Trainers’ Association, Inc.
Continuing Education
1001 East 4th Street
Greenville, NC 27858

Certified and Associate members of the NATA are responsible for submitting to the National Office proof of completion of any Continuing Education Units (CEUs) and activities to be used in updating his/her record within THIRTY (30) DAYS of completing that activity. Failure to do so will mean no credit will be given for that activity.

ENCLOSE A COPY OF THE PROGRAM IF ADVANCE NATA APPROVAL HAS NOT BEEN GIVEN. INCLUDE A TRANSCRIPT IF APPLYING UNDER CATEGORY J, POSTGRADUATE STUDY.

I request CEUs for the following activity:

________________________________________________________________________________________

Total Contact Hours, excluding breaks, meals, etc: ____________________________
Category: _______ Date of Activity: _______

(Name as printed in NATA record) (Membership number)______________________
Address: _____________________________________________
________________________________________
I certify that the above information is correct (Signature of applicant)
PHOTOCOPY THIS FORM FOR FUTURE USE

CEUs awarded: ______
American Airlines, Inc. has made available “Meeting Saver Fares” for the 1989 NATA meeting in Dallas. The savings to our membership equals 40% off the full day coach fare. They will also offer 5% off the lowest applicable round trip fare. A 7-day advance reservation is required. Reservations may be made by calling: 1-800-433-1790. The special NATA “Star” number must be used. It is: STAR 56387.

Placement

A voice activated Watson Administrator has been implemented to upgrade time efficiency and service to our membership and employers for the Placement Vacancy Notices. The new system is complimented with a PC Modem which utilizes the Chairman Bulletin Board System. The modem makes available to those, who have the capability, to produce a hard copy through their printer.

The number (919) 752-1266 enables the user to listen to the Vacancy Notice. A touch-tone phone is needed and the computer will offer step-by-step instructions.

Features include
1. High School
2. College
3. Private and Professional
4. Graduate Assistantship

There are five items which will be needed to utilize the PC Modem.
1. Phone number: (919) 752-0331
2. Baud rate: 1200
3. Parity: None
4. Length of dBase: 8
5. Number of Stopbits: 1

The popular modem software packages being used by most universities are Crosstalk, Smartcom and Procom, to name a few.

This service is still available to you on a twenty-four hour basis and is being updated on the 1st and 15th day of each month.

For further assistance contact the Placement Office by calling our National Office (919) 752-1725.

Public Relations

Cold Facts on Basketball, Wrestling Injuries

The National High School Injury Registry (NHSIR), established by the NATA in 1985, has conducted surveillance studies that identify the risk of sport-related injuries to interscholastic athletes. Results are distributed to the media each winter for high school football and each summer for wrestling and boys and girls basketball.

During the 1987-88 school year, the NHSIR compiled a press kit containing injury statistics for wrestling and basketball. Included in the kit were the following facts:
The TS-7 is a custom functional knee brace which restricts and controls ligamentous instabilities of the knee while providing maximum mobility and comfort.

The TS-7 design is the product of research conducted at Stanford Univ. on knee kinematics and knee braces. This research demonstrated for the first time that the EXTERNALLY measured axis of knee rotation not the INTERNAL axis is the criteria for knee brace design. EXTERNAL soft tissue changes of the thigh must be accommodated by braces which after all attach EXTERNALLY.

The TS-7 incorporates a non-rigid dynamic thigh restraint design which provides for normal soft tissue movement and effectively eliminates brace pistoning and resultant brace migration thus assuring the highest level of user compliance.

This non-rigid thigh design accommodates 15% hypertrophy or atrophy so the TS-7 can be used sooner in rehabilitation.

Contact OMNI Scientific to obtain further information on the many features and advantages of the TS-7.
FACTS ON SPORTS-RELATED INJURIES IN BOYS AND GIRLS HIGH SCHOOL BASKETBALL

I. Introduction

NATA-certified athletic trainers monitored a total of 3,579 male and female basketball players who participated in 192 high school programs (100 girls programs, 92 boys) across the U.S. during the 1987-88 school year. They meticulously maintained medical records for every student-athlete who sustained a sports-related time-loss injury.\(^1\)

The purpose of the study, described by the NATA as the most thorough research on athletic injuries ever conducted at the secondary school level, was to determine the number, severity and type of athletic injuries that occur annually in high school basketball programs. The NATA has been conducting similar studies in high school football since 1986.

By identifying the nature and frequency of sports injuries, NATA officials said they are taking another step toward the development of prevention programs designed to reduce the number and severity of sports injuries.

Here are some of the results from the NATA's study:

There are 697,000 Prep Basketball Players in the U.S.

- There are 379,864 boys participating in 18,952 high school basketball programs in the U.S., an average of 20.04 players per school, based on NATA projections from the participation survey conducted by the National Federation of State High School Associations.\(^2\)
- There are 318,043 girls participating in 18,331 high school basketball programs in the U.S., an average of 17.35 players per school, based on NATA projections from the participation survey conducted by the National Federation of State High School Associations.\(^3\)

23 percent of boys sustained injury

- Of the 1,844 boys monitored in the study, 429 (23 percent) were injured at least one time. Based on NATA projections, 88,374 boys sustained at least one time-loss injury in 1987-88.

Injury toll among boys was 126,072

- The total number of sports-related injuries among boys at the 92 schools was 612 (some athletes sustained more than one time-loss injury during the year), or an average of 6.65 injuries per school. Based on NATA projections, the injury toll (including multiple injuries) among boys basketball was 104,670.

For second straight year, 23 percent of girls are injured

- Of the 1,735 girls monitored in the 1987-88 study, 407 (23 percent) were injured at least one time. The NHSIR study conducted a year earlier also showed that 23 percent of girls sustained time-loss injuries. Based on NATA projections, 74,607 girls sustained time-loss injuries in 1987-88.

Injury toll among girls was 104,670

- The total number of sports-related injuries among girls at 100 schools was 571 (some athletes sustained more than one time-loss injury during the year), or an average of 5.71 injuries per school. Based on NATA projections, the injury toll (including multiple injuries) in girls basketball was 104,670.

Most injuries occurred in practice

- Sixty percent of all injuries sustained by boys and 55 percent sustained by girls occurred during practice. The balance of injuries occurred during games. In 1986-87, the NHSIR indicated that 63 percent of injuries among girls were sustained in practice.

Injuries more likely in second half

- Sixty-five percent of game-related injuries to boys and 67 percent of game-related injuries among girls occurred during the second half. Most game-related injuries among boys occurred during the fourth period (38 percent). Most injuries among girls occurred during the third period (34 percent, compared to 33 percent in the fourth quarter).

Most injuries were to lower extremities

- Ankle/foot injuries were by far the most frequent among boys (43 percent); hip/thigh injuries ranked second (11.3 percent), followed by forearm/wrist/hand (11.1 percent). Knee injuries comprised nine percent of the total.
  - Among girls, ankle/foot injuries were most common (34.2 percent); followed by forearm/wrist/hand (17.3 percent), and knee injuries (16.5 percent).

Most injuries were minor

- Seventy-four percent of the injuries sustained by boys were minor in nature (requiring 7 days or less to heal); 14 percent were moderate (out 8 to 21 days); and 12 percent were major injuries, requiring more than 3 weeks to heal.
  - Seventy-one percent of the injuries sustained by girls were minor; 17 percent were moderate, and 12 percent were major injuries.

Sprains and strains most common...

- The most common sports-related injuries, sprains and strains, comprised 57 percent of injuries to boys and 51 percent of those to girls.

But serious injuries still occur

- Bone fractures were among the most serious injuries. Fractures comprised 8.8 percent of injuries to boys and 5.6 percent of those to girls.
  - Of the 612 injuries sustained by boys who were monitored in the study, 17 (or 2.8 percent) required surgery. Of the 571 injuries sustained by girls, 12 (or 2.1 percent) required surgery. When projected, the approximate number of injuries that required surgery was 3,502 among boys and 2,200 among girls.

No catastrophic injuries

- There were no catastrophic (paralyzing) or fatal injuries directly related to basketball among the 3,579 boys and girls basketball players monitored in the 1987-88 study, nor were they reported in the 1986-87 study on girls. Catastrophic injuries or fatalities are extremely rare in high school basketball.

Basketball an “impact” sport

- The most common “mechanism of injury” among
II. About the National High School Injury Registry
- The purpose of the NHSIR system is to determine the number and severity of time-loss injuries in high school sports. The NATA's goal is to establish a sound basis to more accurately measure the risks associated with high school athletics.
- The NATA has developed and conducted the most comprehensive nationwide study of high school athletic injuries to date. NATA officials describe the NHSIR system as "the first truly in-depth nationwide survey of sports-related injuries in U.S. high schools."
- The studies were conducted by a research team under the direction of John W. Powell, Ph.D., now at the University of Iowa, with assistance from William H. Edwards, Ph.D., based at San Diego State University. Dr. Powell is chairman of the NATA Research and Injury Committee. He also supervises the National Football League Injury Surveillance program.

III. References
1) Time-loss injuries are defined in the NHSIR system as those that require the player to suspend activity for at least the remainder of the day the injury occurred, or the day after onset of injury.
2) The National Federation of State High School Associations (NFHS) reportedly represents 89 percent of U.S. high schools. The NFHS lists 16,867 boys basketball programs among its members in its 1987-88 handbook. The NATA arrived at a total of 18,952 boys basketball programs in the U.S. by dividing 16,867 by .89. We arrived at our total number of high school boys basketball programs in the U.S. by multiplying the projected number of U.S. high schools (18,952) by the average number of players in the NHSIR study (20.04 boys per school).
3) The National Federation of State High School Associations (NFHS) reportedly represents 89 percent of U.S. high schools. The NFHS lists 16,315 girls basketball programs among its members in its 1987-88 handbook. The NATA arrived at a total of 18,331 girls basketball programs in the U.S. by dividing 16,315 by .89. We arrived at our total number of high school girls basketball programs in the U.S. by multiplying the projected number of U.S. high schools (18,331) by the average number of female players in the NHSIR study (17.35 girls per school).

FACTS ON SPORTS-RELATED INJURIES IN HIGH SCHOOL WRESTLING

I. Introduction
NATA-certified athletic trainers monitored 1,387 wrestlers at 47 high schools across the U.S. during the 1987-88 school year. They meticulously maintained medical records for every student-athlete who sustained a sports-related time-loss injury.1
The purpose of this study, which the NATA regards as "preliminary research" because of the relatively small sample size, is to determine the number, severity and type of athletic injuries that occur annually in wrestling programs at the secondary school level.
By identifying the nature and frequency of sports injuries, NATA officials said they are taking another step toward the development of prevention programs designed to reduce the number and severity of sports injuries.

Here are some of the results from the study:

There are 273,000 prep wrestlers in U.S.
- There are 273,334 boys participating in 9,467 high school wrestling programs in the U.S., an average of 28.87 participants per school. Projections are based on the NHSIR study and projections from the number of high schools that participated in the survey conducted by the National Federation of State High School Associations.2

30 percent of wrestlers sustained injury
- Of the 1,357 wrestlers monitored in the NHSIR study, 412 (30.36 percent) sustained at least one sports-related time-loss injury. Based on NATA projections, 82,987 high school wrestlers sustained time-loss injuries in 1987-88.

Injury toll among wrestlers was 138,984
- The total number of sports-related cases reported at the 47 schools was 690 (some athletes sustained more than one time-loss injury during the year), or an average of 14.68 injuries per school with a wrestling program. Based on NATA projections, the injury toll (including multiple injuries) in wrestling was 138,984.

More severe injuries than in other sports
- Fifteen percent of all reported cases were classified as major injuries (precluding participation for 3 weeks or more); 17 percent were moderate injuries (out 8 to 21 days) and 68 percent were minor (out 7 days or less). By comparison, 11 percent of high school football injuries in 1987-88 were classified as major; 17 percent were moderate and 72 percent minor.

Most injuries occurred in practice
- Sixty-eight percent of the injuries occurred during practice. In addition, 61 percent of major injuries occurred in practice. By comparison, 60 percent of football injuries occurred in practice; 52 percent of major injuries in football were practice-related.

Most injuries to the upper extremities
- Injuries to the forearm/wrist/hand were most common (17.2 percent), followed by trunk injuries (17 percent) and shoulder/arm (16.5 percent). Knee injuries ranked fourth (14.2 percent); ankle/foot fifth (8.6 percent).

Sprains and strains most common . . .
- As in most sports, "sprains and strains" accounted for the majority of wrestling injuries (58 percent).

But serious injuries still happen
- Bone fractures were among the most serious injuries. Fractures comprised 7.5 percent of wrestling injuries. Of the 690 injuries reported in the NHSIR study, 21 required surgery (3.04 percent). Of those, 57 percent were knee-related injuries. By comparison, 2.63
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percent of high school football injuries in 1987-88 required surgery. Of those, 63 percent were knee-related.

Most common mechanism of injury

- The most common “mechanism of injury” in wrestling was DIRECT IMPACT (34 percent); followed by TORSION, defined as twisting of soft tissue (20 percent), then STRETCHED MUSCLE TISSUE (11 percent).

No catastrophic injuries

- There were no catastrophic (paralyzing) or fatal injuries directly related to wrestling among the 1,357 boys monitored in the 1987-88 study.

II. About the National High School Injury Registry

- The purpose of the NHSIR system is to determine the number and severity of time-loss injuries in high school sports. The NATA’s goal is to establish a sound basis to more accurately measure the risks associated with high school athletics.

- The NATA has developed and conducted the most comprehensive nationwide study of high school athletic injuries ever done. NATA officials describe the NHSIR study as “the first truly in-depth nationwide survey of sports-related injuries in U.S. high schools.”

- The NHSIR study was conducted by a research team under the direction of John W. Powell, Ph.D., now at the University of Iowa, with assistance from William H. Edwards, Ph.D., based at San Diego State University. Dr. Powell is chairman of the NATA Research and Injury Committee. He also supervises the National Football League Injury Surveillance program.

III. References

1) Time-loss injuries are defined in the NHSIR system as those that require the player to suspend activity for at least the remainder of the day the injury occurred, or the day after onset of injury.

WHERE IT HURTS
HIGH SCHOOL WRESTLING—1988

![Diagram of injury locations]

2) The National Federation of State High School Associations (NFSHSA) reportedly represents 89 percent of U.S. high schools. The NFSHSA lists 8,426 boys wrestling programs among its members in its 1987-88 handbook. The NATA arrived at a total of 9,467 high schools with wrestling programs in the U.S. by dividing 8,426 by .89. We arrived at our total number of high school wrestlers in the U.S. by multiplying the projected number of U.S. high schools (9,467) by the average number of wrestlers (28.87 per school) in the NHSIR study.

Research & Injury

CALL FOR ABSTRACTS
DALLAS, JUNE 1989

Each year during our National Convention, members are continually sharing ideas, procedures, techniques, innovations in and for the profession of athletic training. Most of these conversations are among small groups of members and much of the information exchanged would be highly meaningful for the larger group. Many of these ideas have been developed through systematic data collection and observations made by the athletic trainers in the performance of their responsibilities. The accumulation of this information represents an important form of applied research.

With this in mind, the NATA Research and Injury Committee will offer a Free Communications Section and a Poster Presentation at our National Meeting in Dallas, June 1989. In order to provide organization to these sessions, the Committee is issuing a CALL FOR ABSTRACTS from the NATA membership. The titles of the projects to be presented will be available to members prior to the convention so that they will know which topics will be discussed and at what time during the session. All selected abstracts will be published in the Summer Edition of Athletic Training.

REMEMBER: Your abstract should be of the informative type and should contain:

A. Sentence stating the specific objective of the project.
B. Brief statement of methods.
C. Summary of results/implementations.
D. Statement of Conclusion/recommendations.

All submitted abstracts are sent to a sub-committee consisting of members of the NATA Research and Injury Committee. Each member of this group will independently review and rank each abstract submitted without benefit of the author’s name or affiliation. Final selection of the abstracts for presentation are determined by the review committee’s order of merit and the amount of time allotted for Free Communication Sessions at the Annual Symposium. Each presenter will have fifteen minutes in which to deliver his/her topic. Notification will be made in plenty of time for the preparation of your topic.

The response to these sessions has been excellent. We encourage each member to participate in these information exchanges. So please submit your abstract soon and we look forward to seeing you in Dallas.
CALL FOR ABSTRACTS—NATA FREE COMMUNICATION
NATIONAL CONVENTION—DALLAS, JUNE 1989
APPLICATION

Instruction for Completion of Free Communication Abstract

Please read all instructions before preparing abstract. Carefully develop your abstract so that it will be within the boundaries of the space provided on the application. Members may submit more than one abstract but no member will present more than once.

DIRECTIONS: Mail one clearly typed original prior to January 15, 1989. Photocopy the application and complete, within the boundaries, as indicated.

1) Type title of paper or project in all capital letters, flush left.
2) Indent 3 spaces on a new line and type the name of all authors, with the author that will make the presentation listed first. Type last name then initials (without periods) followed by comma; continue with other authors, if any.
3) Indicate presenting author’s affiliation on the same line following authors.
4) Double space and begin typing text of paper flush left in a single paragraph with no indentations.

Outside the boundaries:
1) Type the mailing address of the presenting author only.
2) Telephone numbers of presenting author.
3) Indicate that presenting author is a member of NATA.
4) Indicate any audio-visual aid required.
5) Indicate whether your preference is Free Speech, Poster Presentation, or either format.

Presenting Author’s Address:

Telephone Number: Home ( ) Work: ( )

Presenting Author’s Membership Classification: Membership Number

Required Audio-Visual Needs:

Prefer: Free Speech Format Poster Presentation Either

Send to: Russ Cagle, ATC
Research and Injury Committee - Free Communications
Willamette University / Athletic Department
Salem, OR 97301

Volume 23 Number 4 • Athletic Training 389
Charles F. Martin
March 18, 1934 - July 21, 1988

Charles Martin passed away at the age of 54. Charles had been a trainer at Northeast Louisiana University for 24 years.

An Oklahoma native, Charles grew up in McAlester and received his B.A. and M.A. from the University of Oklahoma, where he was an assistant trainer. He was a head trainer at Baltimore Md. Jr. College for two years before going to Northeast Louisiana in 1964.

Charles lectured and wrote on heat-related illnesses which have appeared in numerous publications including *Sports Illustrated, NCAA News, Physician and Sports Medicine, Scholastic Coach* and *The American Journal of Sports Medicine*. His work has been credited with helping dramatically to reduce the number of football fatalities caused by heat-related problems.

Charles spoke at the National Athletic Trainers Association Convention twice and also lectured in Taiwan, the Netherlands, and Belgium. Charles was on the NLU Health and P.E. Faculty.

Charles was named to the Louisiana Hall of Fame in 1984. He received his NATA 25 Year Award in 1987.

Charles is survived by his wife, Jean, and a son, Mike, his mother, Mrs. Geneva Martin, and a brother, Kenneth.

Charles Martin will be missed by all of us and a Charles Martin Scholarship Fund is set up at the NLU Alumni Center, Monroe, LA, 71209.
John Duncan Semple  
October 26, 1903 - March 3, 1988

John "Jock" Semple passed away in March at the age of 84, following a bout with cancer. By profession, Jock was a physical therapist and grandfathered in as an athletic trainer, but to many he will long be remembered as the spirit and soul of the Boston Marathon.

Born in Glasgow, Scotland, Jock emigrated to this country at the age of nineteen. Six years later he ran in his first Boston Marathon, and eventually went on to compete in 90 marathons.

After serving in the U.S. Navy for 3 years, Jock attended the Massachusetts School of Physiotherapy on the G.I. Bill and graduated in 1947. He remained in the Boston area to serve as the physical therapist for the Boston Celtics from 1947-1965 and the Boston Bruins from 1971-1978. In 1948 and 1952, Jock accompanied the U.S. Olympic Ice Hockey team as their trainer. The Boston Marathon might not be what it is today without all of Jock's contributions, as he was co-director for the Marathon from 1952-1982.

Jock Semple is survived by his niece, Nan Small. He is also survived by the many he has touched and inspired over the years.
BUILD A GREAT STUDENT BODY!

Good nutrition is absolutely essential for achieving peak athletic performance. But young athletes can't always be counted on to follow sound nutritional advice. Skipped meals, fast food, and fad diets are part of the scene for many of today's athletes.

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- EXCEED helps build lean body mass. Two cans daily, in addition to regular meals and an appropriate weight training program, can help athletes gain ½ to 1½ pounds of lean body mass per week. Actual weight gain will vary according to age, sex, body type, and the duration and intensity of exercise.

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- EXCEED makes a convenient pre-game meal: One or two cans, two hours before competition, provide balanced nutrition that empties from the stomach quickly (98% in 2 hours). The low-bulk, lactose-free formula won't cause gastric distress or nausea.

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of the
NATIONAL ATHLETIC TRAINERS' ASSOCIATION
June 8-13, 1988
Lord Baltimore Hotel
Baltimore, Maryland

SUMMARY OF ACTIONS
NATA BOARD OF DIRECTORS

The following agenda items were considered and actions taken by the NATA Board of Directors at its meetings held at the Lord Baltimore Hotel, Baltimore, Maryland, commencing at seven-thirty o'clock p.m. on Wednesday, June 8, 1988 and terminating on Monday, June 13, 1988 at ten-eleven o'clock a.m., with the following in attendance:

Jerry Rhea, President
Orho Davis, Executive Director
Ken Zeddlin, Attorney
Charles Redmond, District 1
Joseph Godek, District 2
Andy Clawson, District 3
Terry O'Brien, District 3
Dennis Miller, District 4
Jerry Weber, District 5
Paul Zeek, District 6
Mike Nesbitt, District 7
Janice Daniels, District 8
Doug May, District 9
Mark Smaha, District 10
Dennis Sealey, District 10

I. REAPPROVAL OF MAIL AND TELEPHONE VOTE:
Moved by District 7, seconded by District 10 and carried 10-0 that previous action by the Board concerning this matter be ratified and approved. Carried 10-0.

II. REPORTS ACCEPTED FOR INFORMATIONAL PURPOSES ONLY:
Drug Education
Memorial Resolutions
American Academy of Pediatrics
American College Health Association
American Kinesiotherapy Association
National Strength and Conditioning Association
AAHPERD
NATA Grants and Scholarships Foundation
World Health Organization
Canadian Athletic Therapists Association

III. NO ACTION-NO REPORT SUBMITTED:
For record purposes, the following committees, for the record, are indicated as having submitted no written report:
Minority Athletic Trainers
Publications
American Academy of Family Physicians
AAHPERD
American Physical Therapy Association
National Association of College Directors of Athletics
National Federation of State High School Associations

IV. NATIONAL ACADEMY OF SPORTS VISION:
Moved by District 8, seconded by District 6 and carried 10-0 that Robert Shank, Dickinson College, be appointed as liaison to this group.

V. GRANTS AND SCHOLARSHIPS:
Moved by District 4, seconded by District 7 and carried 10-0 that the Board approve the various scholarship winners.
Moved by District 10, seconded by District 6 and carried 10-0 that the Harold W. Mundy Postgraduate Scholarship Award be changed to the Evelyn and Harold W. Mundy Postgraduate Scholarship Award.

The report is as follows:

BE IT RESOLVED THAT
The Board of the National Athletic Trainers Association Grants and Scholarships Foundation, Inc. hereby establishes the Advisory Council of the National Athletic Trainers Association Grants and Scholarships Foundation, Inc. The Advisory Council shall evaluate applications for grants and scholarships and recommend for Board approval recipients to be granted such awards.

BE IT FURTHER RESOLVED THAT
The President of the National Athletic Trainers Association Grants and Scholarships Foundation, Inc. with the agreement of the Executive Director and approval of the Board shall appoint a Chair of the Advisory Council to serve for a term of two years and who will act as agent for the Board in establishing a bank account and writing checks as directed by the Board. The Chair shall appoint, with approval of the Board, persons who shall serve on the Advisory Council for a term of one year. The term of the Chair and other members of the Advisory Council may be renewed without limitation subject to Board approval. The current Chair shall be Mr. Frank George.

NATIONAL ATHLETIC TRAINERS ASSOCIATION GRANTS AND SCHOLARSHIPS FOUNDATION, INC.
RESOLUTION
BE IT RESOLVED THAT
The Board of the National Athletic Trainers Association Grants and Scholarships Foundation, Inc. shall now require that individuals who are identified by the Grants and Scholarships Foundation, Inc. as deserving of a grant or scholarship for application toward tuition or related expenses at an accredited college or university must enroll in such an institution within two (2) years of such recognition by the Grants and Scholarships Foundation, Inc.

BE IT FURTHER RESOLVED THAT
Persons previously identified as deserving of scholarships and grants who have not yet met the condition of enrollment at an accredited college or university be notified that they must meet said condition by March 1, 1991.

To: Jerry Rhea, Orho Davis, NATA Board of Directors
From: Frank George
RE: Grants & Scholarship Committee Report
April 16, 1988 (for June Board Meeting)

Item 1
COMMITTEE MEMBERS AND FUNCTION
Frank George - Chairman
Robert H. Gunn - Candidate Selection
Lindsey McLean - Candidate Selection

Volume 23 Number 4 • Athletic Training 393
Charles Moss - Representative Professional Football
Athletic Trainers Society
Robert Reiss - Representative Professional Football
Athletic Trainers Society
Jerry Rhea - Student House, NFL Liaison
Ronald Sandor - Corporate Fundraising
John Andersen - Representative Professional Basketball
Athletic Trainers Association, Fund Raising

Item 2

FINANCIAL REPORT AS OF APRIL 1, 1988

1. IDS - 2 Year Certificate (0000-8535-967-7) 35,673.69
2. IDS - 2 Year Certificate (0000-8422-252-0) 95,264.92
3. IDS - Cash Management 18,102.34
4. Harold W. Mundy Fund 5,940.97
5. Benevolent Fund (466362) 4,117.41
6. Benevolent Fund (269747) 2,205.75
7. Footseck Checking/Savings Account 70,393.17

$231,549.70

Item 3

APPLICATION PROCEDURES

There have been new applications printed for all scholarship categories. PLEASE NOTE: After the District Directors receive the application, return to the National Office, attention of Sandra Gilbert. Copies will be made and sent to Lindsay Melean, and the original to Frank George for selection.

Item 4

Now that we have a three member selection committee, the selection process takes a good deal longer. This longer process is certainly better and we will continue with it next year. Next year we will stick to the District Directors who will receive the applications and be responsible for the selection committee after February 1, it will be returned to the District Directors.

Item 5

District Applications Qualifying Should Receive Received
1 2 2 .76 - 1
2 10 5 1.5 - 2
3 5 2 1.5 - 2
4 27 3 8.7 - 8 or 9
5 12 2 1.5 - 2
6 5 2 1.5 - 2
7 5 3 1.5 - 2
8 3 1 1.1 - 1
9 1 1 1.1 - 1
10 2 1 .76 - 1

Total 81 26

With a total of 26 awards being given - this is a yield of about 38%.

Item 6

Scholarship Applications and Awards Total by District

The committee was very pleased with the large number of applications and the number of applications which met the February 1st deadline. There were 68 applicants who met the deadline and met all the qualifications. The reasons for not meeting all criteria fell into a number of different categories,

a. Applications received too late.
b. Not a applicant - not a member for one year.
c. Grade Point too low, did not meet the 3.0 level.
d. Did not want athletic training as a career.

VI. PLACEMENT

Moved by District 9, seconded by District 2 and carried 10-0 that the Executive Director explore the feasibility of using a modern system to implement the existing system to National Headquarters.

Moved by District 1, seconded by District 6 and carried 10-0 to accept the report of the Placement Committee for informational purposes.

Moved by District 2, seconded by District 3 and carried 10-0 that the Executive Director proceed with the implementation of a computer system involving the Placement Committee.

VII. AUDIOVISUAL COMMITTEE

The Board, after consideration of the request from the Committee for the purchase of an NATA Library, it was moved by District 9, seconded by District 3 and carried 10-0 that this request be returned to the committee for more in-depth study as to cost, especially as to also the possibility of this sort of library being installed in a future new Headquarters.

The Board also considered the request of the committee to direct both the National Convention and Local Convention Committees to place the audiovisual room closer to the exhibit areas. Following brief discussion, a motion to adopt this recommendation was made. However, there being no second, the President declared the motion dead because of lack of a second.

Attention was likewise called to the letter from the Chairman to Mr. Davis under date of March 21, 1988. Following brief discussion it was moved by District 6, seconded by District 8 and carried 10-0 that this letter be accepted for informational purposes.

VIII. HISTORY AND ARCHIVES

Attention was called to the correspondence forwarded by the Chairman of the Board for discussion and/or action. Following brief discussion it was moved by District 3, seconded by District 6 and carried 10-0 that any further discussion concerning this issue be tabled until after the Annual Business Meeting to be held on Monday.

IX. HONORS AWARDS

Moved by District 6, seconded by District 10 and carried 10-0 that the letter from Mr. Sullivan be accepted for informational purposes.

X. INTERNATIONAL GAMES

Moved by District 3 and carried 10-0 that the Executive Director bring to the Board at its mid-winter Board meeting any proposed changes concerning Article 18.

XI. AMERICAN COLLEGE OF SPORTS MEDICINE

Attention was called to the need for a new liaison for this group and that the Board give consideration concerning this need at a subsequent meeting. It was moved by District 3, seconded by District 5 and carried 10-0 that no further action be taken at this time.

XII. AMERICAN ORTHOPAEDIC SOCIETY FOR SPORTS MEDICINE

In view of the fact that no written or verbal report had been submitted concerning this group up to this point, it was moved by District 10, seconded by District 9 and carried 10-0 that the record note no action taken.

Dr. Joe O'Connor, in his brief appearance before the Board, discussed the activities of the AOSOM, emphasizing its relationship and activities with the NATA. There being no additional comments from any of the Board members, it was moved by District 6, seconded by District 5 and carried 10-0 to accept the report for informational purposes.

XIII. JOINT COMMISSION

The Board was requested, if possible to attend the meeting of this group in the next few months. Moved by District 10, seconded by District 6 and carried 10-0 that the written report be accepted for informational purposes.

XIV. NATIONAL ASSOCIATION OF INTERCOLLEGATE ATHLETICS

Attention of the Board was called to the recent statement on AIDS published by this group with Mr. Smaha requesting that the Secretary Board members had any comments to make. There being no comments forthcoming at this point, it was moved by District 9, seconded by District 6 and carried 10-0 that this report be accepted for informational purposes.

XV. NATIONAL ASSOCIATION OF SMOKELESS TOBACCO

The report is as follows:

Smokeless Tobacco Use in Major League Baseball (U.S.A.)

A recent survey co-sponsored by the National Athletes Trainers' Association and the American College of Sports Medicine (Dallas) "Co-sponsored by the University of Alabama School of Dentistry, has completed a survey of the use of smokeless tobacco among Major League Baseball personnel. During the 1987 preseason/season, 25 out of 26 baseball teams in the American and National Leagues took part in the survey. A group of 528 players, 80 managers, coaches, and 62 support staff responded to the questionnaire.

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Reporting at the 1988 American College of Sports Medicine Annual Meeting, Dr. Wiantowski and Co-investigator Dr. Alfred Hansen, Professor and Chairman of the Department of Biostatistics and Biostatistics at UAB said that three-quarters of Major League Baseball personnel (80% White, 56% Black and 60% Hispanic) had previously used or tried smokeless tobacco. Data revealed that while 43% currently dip or chew smokeless tobacco, White baseball personnel exhibit the largest percentage of usage. Specifically, statistics indicated that the frequency of usage was higher among the White players (36%) than among the Black players (20%). Among those surveyed who currently use smokeless tobacco, 55% started smoking during the ages 18-24. Among users, 66% have dipped or chewed smokeless tobacco for more than 5 years.

This study indicates that the overall use of smokeless tobacco in Major League Baseball is high (43%). Additionally, baseball personnel who start dipping or chewing smokeless tobacco at an early age and continue this practice for long periods of time.

Author: J.F. Wisniewski
Co-author: A.A. Bartolucci
May 25, 1988

Mr. Otho Davis
National Athletic Trainers' Association, Inc.
Philadelphia Eagles Football Club
Veterans Stadium
Philadelphia, PA 19148

Dear Mr. Davis,

On May 26, 1988, I will be presenting our abstract, "The Prevalence, Consumption, Age and Frequency of Usage Regarding Smokeless Tobacco in Major League Baseball (U.S.A.)" during a poster session at the annual meeting of the University of Alabama School of Dentistry at Birmingham's "Co-sponsored by the National Athletes Trainers' Association, Inc. and the University of Alabama School of Dentistry at Birmingham's School of Dentistry, has completed a survey of the use of smokeless tobacco among Major League Baseball personnel. During the 1987 preseason/season, 25 out of 26 baseball teams in the American and National Leagues took part in the survey. A group of 528 players, 80 managers, coaches, and 62 support staff responded to the questionnaires.

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I am looking forward to meeting you in Baltimore. I realize that your schedule will be hectic, but maybe we can get together for lunch or dinner? If not, then maybe
The development of a job description for a full-time professional person who will be hired no later than six months after failure to buy the property in Dallas, Texas, this job description to be subject to approval of the Board of Directors prior to the initiation of a search for this person; the selection will be made by a full-time Executive Director within two years after the failure to buy the property on the Stemmons Freeway in Dallas, Texas. The selection of the Executive Director will follow those listed in the previous paragraph for hiring the Executive Director.

It was moved by District 4 and seconded by District 1 to instruct the Executive Director to immediately contact professional relocation people to consider relocation to search mid-western cities for property sites and/or buildings for possible relocation of the National Office, to be submitted to the Board the next mid-winter meeting while all motions prior to this are being implemented and that there be used the same criteria that was developed in relation to Austin, Texas, namely, central time zone, major air hub, accessibility and visibility and surrounding conditions, including schools, culture facilities, entertainment, university proximity, national convention central location and proper quality of life for families. A vote indicated Districts 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 voting in the affirmative and District 10 voting in the negative.

Districts desiring to be represented on this three-person committee were Districts 1, 4, 5, 6, 8, 9 and 10. A secret ballot indicated the election of Mr. Redmond of District 1, Mr. Miller of District 4 and Janice Daniels of District 8.

It was moved by District 4, seconded by District 2 that the Association hire a full-time Executive Director and that this replace the site location building purchase under consideration at this time. A vote on the issue indicated the affirmative and Districts 3, 5, 6, 7, 8, 9 and 10 voting in the negative.

XXIII. CORPORATE SPONSORSHIP

Moved by District 10, seconded by District 10 and carried that the Board accept Medipren as a corporate sponsor for the NATA based on the letter proposal presented to the Board. A vote indicated Districts 3, 4, 6, 7, 9 and 10 voting in the affirmative and Districts 1, 2, 5 and 8 voting in the negative, the motion was declared to be carried by a vote of 6-4.

Moved by District 2, seconded by District 1 and carried 10-0 that there be drafted a set of guidelines to be used in future regulations with proposed corporate sponsors.

XXIV. CONVENTION COMMITTEE

Moved by District 6, seconded by District 9 and carried 10-0 that the balance of the committee report as presented be accepted for information.

XXV. CAREER INFORMATION AND SERVICES

Moved by District 10, seconded by District 1 and carried 10-0 that the Board accept Medipren as a corporate sponsor for the NATA based on the letter proposal presented to the Board. A vote indicated Districts 3, 4, 6, 7, 9 and 10 voting in the affirmative and Districts 1, 2, 5 and 8 voting in the negative, the motion was declared to be carried by a vote of 6-4.

Moved by District 5, seconded by District 8 and carried 10-0 that Jeffrey Chambers be approved as the new District 5 representative to this committee.

Moved by District 6, seconded by District 8 and carried 10-0 that the Executive Director be charged, along with this committee, to coordinate the production of all printed matter into a single publication.

XXVI. ETHICS

Moved by District 10, seconded by District 8 and carried 10-0 that both the written and verbal reports of this committee be accepted as information.

XXVII. BY-LAWS

Moved by District 6, seconded by District 10 and carried 9-0-1, with District 2 abstaining, that the revised corrections to the By-laws as presented, to be adopted by a majority vote of the Board.

Moved by District 6, seconded by District 1 and carried 10-0 that the two amendments presented as corrections in the assigned duties of the Executive Director and accountant be approved.

XXVIII. NATA GRANTS AND SCHOLARSHIP FOUNDATION

Moved by District 7, seconded by District 9 and carried 10-0 that the NATA Grants and Scholarship Foundation was developed in relation to Austin, Texas.

Moved by District 7, seconded by District 9 and carried 10-0 that the President of the Association draft a letter to the individual trainers of the State of Delaware expressing the Board's concern about the current athletic trainer bill.

Moved by District 6, seconded by District 4 and carried 10-0 that with regard to the Delaware legislative issue that the AOSM be contacted for assistance and that Mr. Zettlin be asked to contact the Delaware Medical Association and the Federal Trade Commission for further exploration into this matter.

Moved by District 7, seconded by District 1 and carried 10-0 that the Association, through the Executive Director, aid District 7 in relation to their licensure issues through contact with Mr. Olden of Phoenix, Arizona.

XXIX. CONTINUING EDUCATION

Moved by District 6, seconded by District 8 and moved 10-0 to approve the athletic training education program (undergraduate and graduate curricula) at the following institutions for an additional five-year period, from June, 1988 to June, 1993:

A. Western Michigan University (Graduate)
B. California University of Pennsylvania (Undergraduate)
C. East Tennessee State University (Graduate) with approval under the 1980 Guidelines for 1988-89 and 1989-90 and then with approval under the 1985 Guidelines for 1990-91
D. Ohio University (Undergraduate)
E. Purdue University (Undergraduate)
F. Western Illinois University (Undergraduate and Graduate)

Moved by District 2, seconded by District 8 and carried 10-0 to grant initial approval to the athletic training education programs (undergraduate and graduate curricula) at the following institutions for a five-year period from June, 1988 to June, 1993:

A. University of Florida (Graduate)
B. Temple University (Graduate)
C. Mount Union College (Undergraduate) - Major Equivalency
D. Sanford University (Undergraduate)- Major Equivalency

Moved by District 1, seconded by District 9 and carried 10-0 to accept the report for informational purposes only.

XXX. PROFESSIONAL EDUCATION

Moved by District 1, seconded by District 6 and carried 10-0 to approve the Athletic Training Education Program (undergraduate and graduate curricula) at the following institutions for an additional five-year period, from June, 1988 to June, 1993:

A. Texas Tech University (Graduate)
B. University of Texas (Graduate)
C. Temple University (Graduate)
D. University of Arizona (Graduate)
E. University of California (Graduate)
In my 30 years in Sports Medicine, 'Sports On Trial' is the most dramatic and effective means of showing the necessity for the safest possible sports programs and the legal liabilities for not doing so."

Dr. Fred Allman
The Sports Medicine Foundation of America Inc.

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Company/School: ________________
Address: _______________________
Telephone: ______________________

*PLEASE SPECIFY DEPT. OR SOURCE OF INFORMATION (PUBLICATION)
C. Northeastern University

Guideline Violations:

- Section II.G.4 (Clinical Supervision). The athletic training program has exceeded the maximum 8:1 student to clinical instructor ratio.
- Section II.G.4 (Clinical Supervision). Students in the program are performing duties that would normally be assigned to regular, qualified staff.
- Section II.G.2 (Structuring Clinical Experiences). A no formal plan for organization and structuring of clinical experiences was presented.
- Section II.G.3 (Affiliated Clinical Settings). No notification of affiliated clinical settings filed with NATA.
- Section II.G.3 (Affiliated Clinical Settings). Evidence that these settings are utilized on a continuous yearly basis by a reasonable number of students.
- Section II.G.3 (Affiliated Clinical Settings). Of the 800 clock hour clinical requirement, a maximum of 400 may be counted from an affiliated clinical setting. (Guideline Violation 6)
- Section II.G.3 (Affiliated Clinical Settings). The athletic training room(s) of the university is not serving as the setting for the completion of 400 of the 800 clinical hour requirement.
- Section II.G.3 (Affiliated Clinical Settings). Normal administrative arrangements are not present for all affiliated settings.
- Section II.H.3 (Clinical Settings). No formal plan for organization and structuring of clinical experiences, evaluation of student progress, and other matters affecting the student's learning experience.

Moved by District 2, seconded by District 1 and carried 9-0-1, with District 9 abstaining, to accept Section 3D of this report as follows:

Moved by District 4, seconded by District 5 and carried 10-0 to approve the following revisions:

- Section II.G.4 (Clinical Supervision). The athletic training program has exceeded the maximum 8:1 student to clinical instructor ratio.
- Section II.G.4 (Clinical Supervision). Students in the program are performing duties that would normally be assigned to regular, qualified staff.
- Section II.G.2 (Structuring Clinical Experiences). A no formal plan for organization and structuring of clinical experiences was presented.
- Section II.G.3 (Affiliated Clinical Settings). No notification of affiliated clinical settings filed with NATA.
- Section II.G.3 (Affiliated Clinical Settings). Evidence that these settings are utilized on a continuous yearly basis by a reasonable number of students.
- Section II.G.3 (Affiliated Clinical Settings). Of the 800 clock hour clinical requirement, a maximum of 400 may be counted from an affiliated clinical setting. (Guideline Violation 6)
- Section II.G.3 (Affiliated Clinical Settings). The athletic training room(s) of the university is not serving as the setting for the completion of 400 of the 800 clinical hour requirement.
- Section II.G.3 (Affiliated Clinical Settings). Normal administrative arrangements are not present for all affiliated settings.
- Section II.H.3 (Clinical Settings). No formal plan for organization and structuring of clinical experiences, evaluation of student progress, and other matters affecting the student's learning experience.

Moved by District 2, seconded by District 1 and carried 9-0-1, with District 9 abstaining, to accept Section 3D of this report as follows:

Moved by District 7, seconded by District 1 and carried 10-0 to approve the following revisions in the Manual, Guidelines for Development of NATA Approved Undergraduate Athletic Training Programs, 1983 Edition, including revisions approved in 1986.

Page 26, line 28:
DELETE: ... supplementary...
ADD: ... allied clinical settings...

Page 27, line 8:
DELETE: ... State regulatory legislation...
c. Peggy Houglum is developing a mechanism for the PEC to participate in the formal programs of each district meeting throughout the year to enhance the membership in matters pertaining to athletic training education.

d. Pete Koehneke reports excellent feedback from school athletics and coach program director regarding the fourteen visitations the PEC conducted this spring. In 1988, twenty-three current programs will be visited and the possibility exists that an additional nine visitations will be conducted for a total of thirty-two visitations.

e. The PEC is conducting two workshops at the NATA Annual Symposium and Business Meeting in Baltimore: An Athletic Training Educator's Workshop and a Program Evaluator's Workshop.

f. Ken Murray has announced that the 1988 "Bud" Sayers Memorial Scholarship will be awarded to get into the profession. The water shed for the colleges are the trainers who are coming out of the high school player. At this time, there are the most respected organization in the athletic health field.

moved by District 8, seconded by District 2 and carried 10-0 to accept the budget recommendations be tabled at this time.

Please find enclosed a revised copy of the short term goals. Receive permission, and then solicit funds from exhibitors, to sponsor the student banquet and other student trainer needs.

3) Provide the high school student trainers and their counselors promoting career opportunities.

4) Discuss the major/minor the student trainers are teaching math and English, but high schools do not want to hire a P. E. major to replace a coach teaching P. E.

5) Collect, assimilate and publish statistics and facts concerning the student trainers level in conjunction with our publicity campaigns.

6) Inform and help the student trainer concerning the National Convention dates.

7) Continue the student banquet . . . increase the certified trainer attendance. Receive permission, and then solicit funds from exhibitors to sponsor the student banquet and other student trainer needs.

LONG TERM GOALS:

1) Formulate and apply the perceptive big picture theoretical skills to the student trainers, and most of the problems and future goals that can be solved and obtained by this committee will be as a firehose at high schools. Apparently there are a lot of jobs teaching math and English, but high schools do not want to hire a P. E. major to replace a coach teaching P. E.

2) Create a networking system involving the high school certified trainers and local guidance counselors for the promoting of career opportunities.

3) Provide the high school student trainers and their parents with career advice and sources for financial help.

4) Prepare and distribute a handbook to all high school student trainers, the school counselors, and high school certified trainers, concerning a career in athletic training, possible financial resources and educational opportunities.
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1-800-431-2743

5) Create liaison memberships from our committee at the high school level . . . contact all high school associations in each state concerning our goals, and seek help in achieving them.
6) Allow the high school student trainer to join NATA.
7) Increase the number of student trainers working in the high schools, by working with the high school trainers committees.
8) Encourage our high school student trainers to work toward a career as a high school trainer, by giving more information about salaries, structure and job opportunities.

ORGANIZATIONAL CHART
DISTRICT REPRESENTATIVES 1-10

DISTRICTS 1-10

XXXVIII JOURNAL:
Moved by District 1, seconded by District 9 and carried 10-0 that the verbal report be accepted for informational purposes.

XXXIX ATHLETIC TRAINERS PHYSICIANS COUNCIL:
Moved by District 2, seconded by District 6 and carried 9-0 with District 3 being absent, that there be formed an Athletic Trainer Physicians Council to be one of the committees of the NATA.

XL NATIONAL HIGH SCHOOL ATHLETIC COACHES ASSOCIATION:
The Board received as information the verbal report rendered by Skip Morris, the new Executive Director, concerning some of the future plans of this organization in relation to its continued cooperation with the NATA.

XLI GATORADE:
Moved by District 6, seconded by District 2 and carried 10-0 to accept the proposal from Mr. Bill Schmidt of Gatorade to publish a membership directory for the NATA.

XLII JOHNSON AND JOHNSON:
Mr. Jack Weakley, in behalf of J and J, briefly commented on the success of last year's efforts for the NATA and also indicated some thoughts for the broadening of NATA support in the future. It was moved by District 8, seconded by District 4 and carried 10-0 that this verbal report be received as information.

XLIII PUBLIC RELATIONS:
It was moved by District 6, seconded by District 8 and carried 10-0 that Mr. Davis further discuss this issue with Mr. LeGear. Concerning the request for financial support to publicize athletic trainers in the Summer Olympics of 1988, it was moved by District 2, seconded by District 7 and carried 10-0 that the NATA tape library to replace audio tapes and modest funding, as approved by the Executive Director, toward this request.

It was moved by District 6, seconded by District 4 and carried 10-0 that the one hour of time requested for their presentations at the district meetings.

XLIV REPORT OF DR. O'CONNOR:
It was moved by District 6, seconded by District 5 and carried 10-0 that Dr. Joe O'Connor's report relative to Guidelines or Standards for management of Athletic Injuries be received for information only.

XLV IN APPEAL:
The scheduled ties agenda having been completed at this point and after brief words of appreciation by Mr. Rhea present as in the previous sessions with the exception of Dennis Skelley serving as the new Director for District 10 and Terry O'Brien serving as the new Director for District 3.

XLVI HIGH SCHOOL TRAINERS COMMITTEE:
Moved by District 6, seconded by District 4 and carried 10-0 that the verbal report of the Chairman be accepted as information only and that he be requested to submit a written report for Board approval at the mid-year meeting.

XLVII NATIONAL OFFICE:
Moved by District 1, seconded by District 2 and carried 10-0 that the Executive Director develop and implement a broader benefits package for NATA employees.

XLVIII NATIONAL ASSOCIATION OF SCHOOL NURSES:
Moved by District 7, seconded by District 6 and carried 10-0 that the report presented to the Board by the representative of this organization be received as information.

XLIX NATIONAL ASSOCIATION OF GIRLS AND WOMEN IN SPORTS:
Moved by District 6, seconded by District 5 and carried 10-0 that the verbal report presented concerning a meeting with this group, as presented by Mr. Smaha, be accepted as information.

L AMERICAN TRAUMA SOCIETY:
Moved by District 7, seconded by District 6 and carried 10-0 that Robert Reese be directed to investigate the status of a strategic plan of this group, as it pertains to designing and implementing a national sports injury prevention campaign in 1987-1988.

Moved by District 6, seconded by District 5 and carried 10-0 to accept the recommendation that the Board of Directors allow certified members of the American Trauma Society to use the NATA name, logo and initials for professional purposes. A vote indicated Districts 5 and 10 being in opposition, it then being declared that the motion had failed.

Moved by District 6, seconded by District 9 and carried 10-0 that Mr. Reese submit a vitae to the Board for approval as liaison representative to this group.

LI HISTORY AND ARCHIVES:
Moved by District 6, seconded by District 4 and carried 10-0 that the one-page handwritten report be accepted as information only.

LII CONTINUING EDUCATION:
Moved by District 6, seconded by District 5 and carried 10-0 to accept the recommendation that one (1) CEU per year be awarded for participation in the National High School Injury Registry.

Moved by District 9, seconded by District 5 and carried 10-0 to accept the recommendation that one (1) CEU per year be awarded for on-site Professional Education team members that are not PEC members.

Moved by District 5, seconded by District 4 that the Continuing Education Committee and the Audiovisual Committee be instructed to jointly pursue the development of video-tape library to replace audio tapes and to be used for continuing education requirements for membership. For example, video taping of National meetings, district meetings, etc. Following brief further discussion, it was moved by District 6, seconded by District 4 and carried that this issue be tabled for further clarification and subsequent mail vote.

LIV MEMBERSHIP:
Moved by District 6, seconded by District 3 and carried 10-0 to accept this report as information only.

LV SCHERING SYMPOSIUM:
Moved by District 6, seconded by District 3 and carried 10-0 that the next topic for presentation by Schering be on head and neck.

LVI USE OF NATA LOGO:
Moved by District 5, seconded by District 6 that the Board of Directors allow certified members of the Association to use the NATA name, logo and initials ATC-CAT as appropriate on a business card for professional purposes. A vote indicated Districts 6 and 5 voting in the affirmative and Districts 1, 2, 3, 4, 7, 8, 9 and 10 being in opposition, it then being declared that the motion had failed.

Moved by District 7, seconded by District 6 and carried 10-0 to direct the Ethics Committee to investigate the use of logos by other organizations as it relates to professional purposes, with a report to be submitted to the Executive Director by December 1, 1988.

LVII ADJOURNMENT:
The Board of Directors meeting adjourned at 3:45 p.m., June 14, 1988.
PROCEEDINGS of the NATIONAL ATHLETIC TRAINERS’ ASSOCIATION

June 13, 1988
Lord Baltimore Hotel
Baltimore, Maryland

ANNUAL BUSINESS MEETING

MONDAY MORNING SESSION
June 13, 1988

The Fortieth Annual Business Meeting of the National Athletic Trainers Association, Incorporated, was conducted at the Lord Baltimore Hotel, Baltimore, Maryland, at eleven-fifteen o’clock a.m., Mr. Jerry Rhea, President, presiding.

At this time, I would like to call to order this Fortieth Annual Business Meeting of the National Athletic Trainers Association, Incorporated.

In other words, assets are 1,000 times greater than they were in 1972. That, I might add, is particularly extraordinary in light of the fact that this is basically a volunteer organization.

Further, these results are not accidental. They are based on the vision of the board, the administrative staff in Greenville and the work of the many Committee Chairs and members. They are based on the special and unceasing efforts of your Officers and Board of Directors.

Special acknowledgement should be made to your Executive Director, Mr. Otho Davis, for systematically working to build the assets of the Association to the $2 million level. He has effectively controlled costs. He has generated substantial revenues, particularly in the area of corporate sponsors.

At the $2 million level, the financial strength of the organization reflects his dedicated efforts over a considerable period of time.

In conclusion, let me say that I am pleased to report that the organization is in excellent financial health.

Thank you very much.

PRESIDENT RHEA: Are there any questions concerning this report? If not, again, thank you very much.

I would at this point, entertain a motion to accept the Treasurer’s report.

PRESIDENT RHEA: I would so move.

MR. BILL CHAMBERS (District 8): I would second the motion.

PRESIDENT RHEA: All in favor of the motion to accept the report of the Treasurer please indicate by saying aye; are there any in opposition? I will declare the motion unanimously carried.

At this time, it is my great privilege to present to you a man who has been a trainer friend for many years, Mr. Bill Schmidt, from Gatorade. He would like to make a brief statement at this time.

PRESIDENT RHEA: Thank you very much, Jerry.

In June we were able to go ahead and present a number of exhibits that Gatorade has done a number of things this year and, in addition to that, we looked at some other opportunities of needs that the organization had and there were topics in relation to each district meeting that they thought their membership needed education on or some assistance on.

These are topics, for example, like, “How do I negotiate a salary — how do I prepare for an interview — how do I write a resume” and that type of thing.

We have presented a package this morning to the Board where we would go ahead and underwrite the cost of providing an expert in that particular area and providing the necessary services at each of the district meetings.

In conclusion, let me say that I am pleased to report that the Gatorade booth is a part of Gatorade, in the exhibit area and the GSSI booth but is a part of Gatorade, in the exhibit area. Probably the biggest asset of this whole program is the sports science exchange, in relation to which information will be distributed to all members.

We have over 9,000 athletic trainers who have signed up for membership, as well as 9,000 medically related individuals who have also signed up. We are sending out the information nationally and the beauty of that is that you address the various groups, this information is readily available, can be xeroxed and can be presented in a first-class manner.

It does cover certain topics that are key to the athletic training community as well as the sports medicine community. You can put that in a file folder that we also provide and then you can have the information at your fingertips.

There is a booth, and it is not the Gatorade booth, but it is the GSSI booth but it is part of Gatorade, in the exhibit area and so, by all means, go ahead and sign up for your free membership and we have something like 12,000 to date signed up.

You know, with that financial picture of your organization presented to you, I think I am willing to take a few minutes of your time and a short, a few minutes of your time and a short, a short period of time to talk about the relationship that the organization has with the NATA.

In Christ’s Name we pray. Amen.
up here on the dais.

I know that Johnson and Johnson and I are more pleased with how this organization has grown within the past several years, and we just pride ourselves as being able to assist you in a small way and also have the kind of relationship and oneness that you all have. (Laughter) I will be happy to thank you all of you individually. Please feel free to stop at the GSSB booth and the Gatorade booth.

We are delighted to have the President of Johnson Business that exists and will, I am sure, continue to exist in the future.

Thank you very much. (Applause)

PRESIDENT RHEA: Thank you, Bill.

At this time, I would like to ask Jack Weakley from Johnson and Johnson to come up and address our membership.

MR. JACK WEAKLEY (Johnson and Johnson): Thank you, good morning, everyone. You know, the crowd gets bigger each year. You may have to move other people to the back row. (Laughter)

I want to tell you how proud we at Johnson and Johnson are in relation to our corporate sponsorship. The 1990's program, I am sure some of you have seen and which the rest of you probably will see, these programs at the district meetings have had a tremendous reach over the years. The Johnson and Johnson family looks forward to that kind of forum at your district meetings in the future.

Now, a little bit of good news and a little bit of bad news.

I want to introduce a fellow who most of you know and hear the name of, the President of Johnson and Johnson. His name is Jim Viola.

The bad news is that Jim will be leaving Johnson and Johnson on August 1st. However, the good news is that he will represent Johnson and Johnson in the area of Orthopedics, and, therefore, his name will be going to be seen up with him for awhile. (Laughter)

I was happy to hear you will never come up here again.

MR. VIOLA: Thank you.

I am looking forward to this new relationship and I will do the best I can.

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MR. VIOLA: Thank you.
Board of Certification, will announce the Eddie Wojek Scholarship Award sponsored by the Mueller Chemical Company.

MR. PAUL GRACE: The winner of the Eddie Wojek 1988 Achievement Award is Daniel R. Gerhardt, Lock Haven University; sponsor, National Athletic Trainers Association.

Mr. JOE GIECK: The American Orthopaedic Society for Sports Medicine Distinguished Service Award will be presented to Tow D. Dinges. (Applause)

At this point, Terry O'Brien will recognize the working volunteers.

MR. TERRY O'BRIEN: Thank you, Otho. (Applause)

Thank you very much.

I will now ask Bob Behnke to come forward and accept his award for the Eddie Block Award.

Mr. JOHN LOPEZ: First of all, those of you who... Presentation of award and applause ensued...

Thank you very much.

Mr. JOE GIECK: The Eddie Wojek 1988 Achievement Award recipient is Robert W. McLeary, University of North Carolina, Chapel Hill. (Applause)

Mr. JOE GIECK: I would now like to present Frank George of Brown University, who will announce the NATTA, Incorporated Scholarship Awards.

Mr. JOE GIECK: Thank you for giving me the opportunity to be the Committee Chairman. A special thanks to the committee members for their assistance the past three years. Our board, some of the committee members passed away this year.

Last summer, Dick Vandervoort, one of our committee members, passed away. He was a real driving force on our committee and to the best of my knowledge is the first NATTA member who has passed away through his efforts.

I would like to thank all of my committee members—Robert Gunn, Lindsey McLean, Charles Moss, Bob Rauh, John Sendre, John Anderson and especially Dean Weber for the great job he did in relation to the student banquet last night. He put it all together and did a wonderful job with it. We are also proud to announce that we had three sponsors for that banquet.

This year we awarded twenty-six $1,500 scholarships. Also, I wish to express our thanks and welcome to our President."..." (Applause)

Our thanks go to the Drackett Company.

We wish to extend our congratulations to the Professional Athletic Trainer of the Year—Otho Davis and Ronnie Barnes.

We likewise extend our thanks to the National Football League—Joe Rein and Pete Roselle. The NFL Charities’ total donation to date is $65,000.

We also extend our thanks to the new Dick Vandervoort Scholarship, administered by the National Basketball Trainers Association.

Also, a special thank you to Ed Stein in relation to the new Protector Postgraduate Award. I might add that our financial statement, as of April 1, 1988, shows total assets of $231,549.70.

This year we had eighty-eight applications that met the February 1, 1988 deadline and they also met all of the qualifications.

Twenty-six winners were selected, for a yield of thirty-eight percent.

We would now like to read the scholarship winners and sponsors.

The Eddie Wojek 1988 Achievement Award winner is Daniel R. Gerhardt, Lock Haven University; sponsor, National Athletic Trainers Association.

Robert H. Gunn Scholarship Award was given to Cynthia L. Keim, Boston University, the sponsor being the National Football League Charities.

National Board of Certification—President—John Lopez, the Director of Towson Sports Medicine, Incorporated.

Post Graduate Scholarship Awards were given to Cynthia L. Keim, Boston University, the sponsor being the National Football League Charities.

The Eddie Wojek 1988 Achievement Award winner is Daniel R. Gerhardt, Lock Haven University; sponsor, National Athletic Trainers Association.

Robert H. Gunn Scholarship Award. The recipient is Michael A. Chiar, California State University—Fullerton; sponsor, National Athletic Trainers Association.

Sayers J. Miller, Jr., Scholarship Award. The recipient is Suzanne L. Snead, University of Nebraska; sponsor, National Athletic Trainers Association.

Don C. Lumpkin, Jr., Scholarship Award. The recipient is Bonnie L. Borchert, Ball State University; sponsor, Cramer Products, Inc.

The Eddie Wojek Scholarship Award. The recipient is A. M. Moll, Ohio University; sponsor, Cramer Products, Inc.

The Eddie Wojek Scholarship Award. The recipient is F. X. Linskey Scholarship Award. The recipient is Lynnette Y. Schwartz, East Carolina University; sponsor, Johnson and Johnson Products, Inc.

The Eddie Wojek Scholarship Award. The recipient is Thomas Lang, Mankato State University; sponsor, Chattanooga Corporation.

The Eddie Wojek Scholarship Award. The recipient is Robert W. McLeary, University of North-...
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for so many people and foremost, he cared for the athletic training profession and the NATA; he cared for his players and his family more important, he cared for all the children in this area.

The Ed Block Courage Award Foundation was named in memory of Eddie, who served the community and was a voice for the problem of child abuse.

The Foundation has been raising money over the last four years in order to fight the problem of child abuse locally. The Foundation offers scholarships for children, to be trained in the field of athletic training, and to attend college.

This is our 8th year of existence. In the first six years of the award, almost $100,000 was raised by recognizing the work of various people that have contributed to the health and safety of athletes.

Now, we are going to leave all of this in the hands of Mr. Rhea. It is time for him to step back and let others take the lead.

Thank you very much.

MR. PATRICK BARR (Athletic Trainer, University of Denver). I am the athletic trainer at Denver and at this time I would like to make a proposal. I believe that we need to move from Greenville. Well, we have not moved. I am disappointed, I can tell you that I was disappointed last year when you stop growing, you start to die and we need to move from Greenville.

This is our tenth anniversary. In the first six years of the National Athletic Trainers Association: Indeed, it is a profession for so many people and foremost, he cared for the athletic training profession and the NATA; he cared for all the children in this area. What does a trainer do, for example, when he is forty years old and the coach called that unscheduled practice. "Good morning, Dr. Rhea, I have had the opportunity to lead, therefore, at this time, I would like to make a proposal but, first of all, I think we need to be continually on guard and aware that we are the image of the NATA, that we are in a public relations campaign every day — in our training rooms, in our schools, in our communities, our churches and service clubs, even our neighborhoods.

I think we need to reflect on what she does as a professional athletic and her guidance because everything that he does will not fly, he always managed to pull it off and get it done. I am going to continue talking while you are walking and, yes, Mary Edgerley.

Therefore, at this time, I would just like to present her with something a little special. You know, not everybody has a girlfriend like Mary. You know, not everybody has a girlfriend like her. The assembly applauded as Ms. Edgerley was presented with a bouquet of flowers

However, ladies and gentlemen and members of the National Athletic Trainers' Association: Indeed, it is a pleasure to stand before you today. You know, a little over a year ago, my wife, Jackie, and I had a decision to make. It had come time, after much thought and the decision whether or not I would run for President of this Association. We chose to discuss it over dinner at one of our favorite Chinese restaurants. After the decision was made and we had finished our meal, we opened the menu which, as you know, is a tradition in one of these establishments. Although there are not usually many great revelations inside the menu, there is one that I will always remember because it was moved by what mine said. I decided to place it on my bulletin board at home and I brought it with me today. It says, "You will be bestowed some great honor."

Ladies and gentlemen, it is indeed a great honor to have the opportunity to serve as your President. As I assume this great challenge, I have been blessed with self-confidence and confidence in our cause and what we stand for. I am sorry that I have had the opportunity to educate myself pertaining to matters that affect this Association with nine years of experience as an Officer serving the membership, as an athlete, a coach, an employer, oriental, my country. However, I have been very fortunate to serve under the great leadership of Mr. Davis, Dr. Barton and Mr. Rhea, along with the other members of the Board, past and present, all of whom have wisdom, common sense and concern for the direction and growth of this great profession.

We all play a part in getting better, in being the best. We all have a feeling of the importance of team work. It is a part of our way of life.

I recently read a book entitled, "When All You Ever Wanted For Nothing." By Harold Kushner. I would like to share with you an excerpt from that book. He says the following:

"I have stood in the Canadian Rockies and I have seen the gurgling water by flows of mountain streams. As the water nears and to the beach, it would seem that nothing on earth is harder than rock and nothing easier than to drench water. Yet, over the centuries, the water has won the battle, cutting into and reshaping the rock. No one drop of water is stronger than rock but rock cannot stand up to the persistence of water."

It will not take us centuries to reshape, sculpt and mold our profession into its perfect shape. We have proven that and many of us have contributed a great deal.

Last Thursday, thanks to the efforts of Mr. Davis, we have an opportunity to visit the White House and tour the Lincoln Memorial, monument and some of the things that caught my eye and I would like to share it with you.

Jefferson Memorial there is one of his saying inscribed upon the wall of the statue — "We all play a part in getting better, in being the best."

In conclusion, I encourage every one of you to reach out to us. Communicate. Express not only your concerns but your ideas on how we can become stronger.

I would like to close with a few remarks. I am not a trainer for frequent changes in laws and constitutions, but laws and institutions must go hand in hand with the progress of the human spirit. As that becomes more developed, more enlightened, as new discoveries are made, new truths discovered and manners and opinions change, with the change of circumstances original fundamental laws also to keep pace with the times. We might as well require a man to wear still the coat which fitted him when a boy as civilized society to remain ever under the regimen of their barbaric ancestors.

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not saying that everyone is being put down and not trying to put the finger on any individual or group. I am trying to put the finger on us as an organization — that we have to start looking at ourselves.

It is nice knowing that you have $2 million in the bank and maybe, with the help of Johnson and Johnson, Gatorade and Quaker — maybe through their marketing and their employee relations, labor personnel, that maybe we can start looking at some of our situations.

You know, in some way, if we use our leadership and our organization, there might be a way. Now, I do not have a solution but there might be a way that we can send our kids to college with government subsidies and loans.

Thank God for those people who purchased a house before the 1970s, before the real estate boom. Thank God that you are maybe only paying between $400 and $500 but I can tell you that a large number of trainers have to have roommates so that they can live in an apartment because at our salaries, we are not going to be able to buy houses and to live a decent life.

Granted, our city bus drivers are only making between $45,000 and $50,000 in the city and also, granted that there are high schools that do pay well if the individual is in the system long enough.

A lot of the college trainers are being put out to pasture at earlier ages, not by choice but by what is called simple economics.

You hire somebody for $18,000, you fire somebody making $32,000 and you save $14,000.

Some universities are doing it not so politely — just telling them to get out and retire and there are others who are trying to be more polite about it, they are saying, "Hey, we can save some money by just not paying them."
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\(^1\) LANCET, Dec. 21/28, 1422, 1985
\(^2\) Recommendations for Prevention of HIV Transmission in Health Care Settings. Centers for Disease Control. MMWR 36: (suppl. #2S), 1987

In vitro activity does not necessarily correlate with in vivo effectiveness, and the clinical significance of this in vitro activity is unknown. It must be remembered that by far the most common means of spread of this virus is by sexual intercourse, followed by parenteral exposure to contaminated blood or blood products, and prenatal transmission from infected mother to offspring. Therefore the significance of the role of antiseptics in the prevention of AIDS remains to be evaluated.
CONSERVATIVE MANAGEMENT OF SHOULDER IMPINGEMENT SYNDROME
continued from page 353


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EDITOR-IN-CHIEF COMMENTS
continued from page 311

Another concern that we have however, is the availability of the JOURNAL to the students who are not members of the NATA. We are interested in finding out if most certified members request that their magazine be sent to their home address rather than office (in which case it is probably not shared with others). Can you provide me with any statistics associated with this? A thought we had might be for the JOURNAL to request the work address so that the periodical could be sent to the office.

Additionally, distribution to other sources such as school libraries, city libraries, athletic directors, etc. was questioned. What is the present policy in regards to sending the JOURNAL to non-members of the NATA? Is there any way that the NATA can expand this, at a reasonable cost, to publicize athletic training to those who don’t know us?

Both of these ideas are simply investigative thoughts that we, as a committee, discussed in an attempt to help the prospective student trainer to become more aware of our profession. Any answers or comments that you might share with me concerning this matter would be greatly appreciated.

Thanks for taking your time to assist our committee’s effort. I will be looking forward to your reply.

Sincerely,

Kathy Osborn, ATC
Cushing Coliseum
Kearney State College
Kearney, NE 68849
(308) 234-8514

EDITOR-IN-CHIEF: A subscription form is published in every issue of the Journal. (see page 359, this issue) Non-NATA members are encouraged to subscribe. We welcome them to our readership. Most of our non-member subscribers are, in fact, libraries, athletic directors, etc., as you have mentioned. Our subscription fee is quite nominal when compared to that of other professional journals. The Journal is mailed to the address furnished by the member or subscriber.
"ARTU, the Ankle Reflex Treatment Unit by Universal is one of the most significant pieces of equipment available for treating foot and ankle injuries. It is highly effective in treating pain, edema, stiffness and many other ankle and foot pathologies. Treatment sessions are shorter, and fewer sessions are required to complete rehabilitation. Without question, I have seen the quality of patient care and the efficiency of my practice improve as a result of implementing ARTU into treatment programs." Robert A. Donatelli, MA, PT., Physical Therapy Associates, Atlanta, Georgia.

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Eleventh Annual N.A.T.A. Student Writing Contest

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

1. This contest is open to all undergraduate 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 $200.00 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 Contributors” section of this issue of Athletic Training. It is suggested that before starting students read: Knight KL: Writing articles for the journal. Athletic Training 13: 196-198, 1978. NOTE: A reprint of this article, along with other helpful hints, can be obtained by writing to the Writing Contest Committee Chairman at the address below.

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, 1989.

NATA Student Writing Contest
Deloss Brubaker, EdD, ATC
Knollwood Center for Specialized Medicine
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Journal Deadlines/Designees

The Editorial Board will review papers submitted on an individual basis, work with the authors and prepare the papers for publication.

As stated in number 5 of the Guide to Contributors, this review process takes from 6 to 12 weeks. Send manuscripts, Case Reports, and Tips from the Field to:

Ken Knight, Editor
Physical Education Department
Indiana State University
Terre Haute, IN 47809

In order to avoid confusion and delays on other contributions to the Journal, the deadlines are provided below.

The deadlines are:

**Journal**
- Spring Issue: December 15
- Summer Issue: March 1
- Fall Issue: June 15
- Winter Issue: September 15

Send material for Announcements, Letters to the Editor and Committee Forum to:

Steve Yates, Editor-in-Chief
P.O. Box 7265 - Sports Medicine Unit
Wake Forest University
Winston-Salem, NC 27109

Information on upcoming events for the Calendar of Events section should be sent to:

Jeff Fair
Athletic Department
Oklahoma State University
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New Products should be sent to:

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Head Athletic Trainer
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Moscow, Idaho 83843

Items for the Student Athletic Trainer Forum should be sent to:

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Guide to Contributors

Athletic Training, the Journal of the National Athletic Trainers Association (NATA), Inc., welcomes the submission of manuscripts which may be of interest to persons engaged in or concerned with the progress of the athletic training profession. Manuscripts should conform to the following:

SUBMISSION POLICIES

1. Submit one original and three copies of the manuscript and artwork to the editor.
2. We accept manuscripts for review with the understanding that they are original, have been submitted solely to Athletic Training, and are not under simultaneous review by any other publication. All manuscripts must be accompanied by a letter, signed by each author, containing the following statements. Manuscripts which are not accompanied by such a letter will not be reviewed.

   This manuscript contains original unpublished material that has been submitted to Athletic Training, is not under simultaneous review by any other publication, and will not be submitted elsewhere until after a decision has been made concerning the suitability for publication by Athletic Training. In consideration of the NATA taking action in reviewing and publishing (or not publishing) the submission, the authors sign this letter to transfer, assign or otherwise convey all copyright ownership to the NATA, in the event that such work is published by the NATA.

3. Materials taken from other sources, including text, illustrations, or tables, must be accompanied by a written statement from the author and publisher giving permission to reproduce the material. Photographs of individuals must be accompanied by a signed photograph release form. Accepted manuscripts become the property of the National Athletic Trainers Association. For permission to reproduce an article or part thereof, published in Athletic Training, send request to the Editor-in-Chief.

4. Published manuscripts and accompanying artwork to be reproduced will be returned with a stamped, self-addressed envelope.

5. Manuscripts are reviewed and edited to improve the effectiveness of communication between the author and the reader, and to assist the author in a presentation compatible with and the accepted style of Athletic Training. The author accepts responsibility for any major corrections of the manuscript as suggested by the editor. The initial review process usually takes from six to 12 weeks.

6. Athletic Training utilizes a double blind review process. Authors should take care that they are not identified in any way except on the first title and biographical sketch pages.

STYLE POLICIES

7. Personal pronouns (I, we) and the active voice are preferred. Use the third person for describing what happened, "I" or "we" (if more than one author) for describing what you did, and "you" or the imperative for instructions.

8. Each page must be typewritten on one side of 8 1/2 x 11 inch plain paper, double spaced, with a one and one-half inch left margin and one inch margins elsewhere.

9. Manuscripts should contain the following information, organized in the order listed, with each section beginning on a separate page:
   a. Title page
   b. Biographical sketch
   c. 2nd Title
   d. Abstract
   e. Text (body of manuscript)
   f. References
   g. Acknowledgements
   h. Legend to illustrations
   i. Illustrations - each on a separate page
   j. Tables - each on a separate page

10. Titles should be brief within descriptive limits (a 16 word maximum is recommended). The name of the disability treated should be included in the title if it is the relevant factor; if the technique or type of treatment is the principle reason for the report, this should be in the title. Often both should appear. The title page should also include the names, titles, and affiliations of each author, and the name and address of the author with whom correspondence is to be directed. Both the title and bibliographic sketch pages should be unnumbered.

11. A brief biographical sketch of each author is requested.

12. A second title page which includes only the title and with no reference to the authors is next. Begin numbering the pages of your manuscript with this page as #1.

13. A comprehensive abstract of 75 to 200 words must accompany the manuscript. This abstract should succinctly summarize the manuscript, the major points of the body, and the author's summation and/or conclusions. To state in the abstract the purpose or hypothesis of the article is unacceptable.

14. Begin the text of the manuscript with an introductory paragraph or two in which the purpose or hypothesis of the article is clearly stated. Highlighots of the most prominent work of others as related to the subject at hand is often appropriate for the introduction, but a detailed review of the literature should be reserved for the discussion section. The body or main part of the manuscript varies according to the type of article (examples follow). Regardless of the type of article, however, the body must include a discussion section in which the importance of the material presented is discussed and related to other pertinent literature. Liberal use of headings and subheadings, charts, graphs, and figures is encouraged.

The body of an experimental report consists of a methodology section, a presentation of the results, and a discussion of the results. The methodology sections should contain sufficient detail concerning the methods, procedures, and apparatus employed that others can reproduce the results. The results should be summarized using descriptive and inferential statistics and a few well planned and carefully constructed illustrations.

The body of a review of the literature article should be organized into subsections in which related articles of others is presented and summarized. Each subsection should have a heading and a brief summary; possibly one sentence. Sections must be arranged so they progressively focus on the problem or question posed in the introduction.

The body of a Case Report should include the following components: personal data (age, sex, race, marital status, and occupation when relevant — but not name), chief of present complaint (including symptoms), results of physical examination (example: "Physi-

15. The Reference page(s) accompanying a manuscript should list authors numerically and in alphabetical order, followed by the text of the manuscript which will take the form of a number in parentheses, (7), directly after the reference or name of author being cited, indicating the number assigned to the citation. The list of references and citations should be in the following form: a) articles: author(s) (list all) with family names then initials, title of article, journal title (abbreviated as per Index Medicus and underlined), volume, inclusive pages, year. Issue number is required (each issue begins with page #1) but must not be included otherwise. b) books: author(s), title of book (underlined), city of publication (and state if the city is not major), publisher, year, inclusive pages of citation. Examples of references to a journal, book, chapter in an edited book, and presentation at a meeting are illustrated below. Note lack of punctuation in authors names.


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Date of Filing: October 1, 1988
Title of Publication: ATHLETIC TRAINING. The Journal of the National Athletic Trainers Association, Inc. (NATA Inc.)
Frequency of Issue: Quarterly
Location of Known Offices: 1001 East Fourth St., Greenville, NC 27858; 116 N. Railroad St., Winterville, NC 28590
Editor: Steve Yates, Wake Forest University, PO Box 7285, Winston Salem, NC 27109
Managing Editor: Barbara Manning, PO Box 600, Winterville, NC 28590
Owner: National Athletic Trainers Association, Inc., 1001 East Fourth St., Greenville, NC 27858

Known bondholders, mortgagees, and other security holders owning or holding one (1) or more of total amounts of bonds, mortgages or other securities. None.

Extent and Nature of Circulation

Total No. copies printed (Net press run) 12,825
Paid Circulation

Dealers, carriers, vendors, counters, etc. 0
Mail subscription 12,426
Free Distribution

Samples, comps, etc. 199
Total Distribution 12,625

Office use, left-over spoiled, unaccounted 200
Returns from news agents 0
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