



THE SELECTION, USE, AND MAINTENANCE OF THE MODALITIES OF
PHYSICAL THERAPY BY SELECTED PROFESSIONAL ATHLETIC
TRAINERS IN THE DALLAS-FORT WORTH AREA


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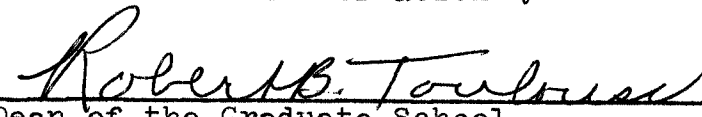
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TRAINERS IN THE DALLAS-FORT WORTH AREA

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By

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TABLE OF CONTENTS

	Page
LIST OF TABLES	iv
Chapter	
I. INTRODUCTION	1
Statement of the Problem	
Definition of Terms	
Limitations of the Study	
Assumptions	
Survey of Related Literature	
Chapter Bibliography	
II. PROCEDURES FOR COLLECTING DATA	11
Sources of Data	
Construction of the Interview Guide	
III. PRESENTATION OF DATA	13
Educational Background of the Trainers	
Practical and Professional Experience	
of the Trainers	
Selection of the Modalities	
Use of the Modalities	
Maintenance of the Modalities	
Chapter Bibliography	
IV. SUMMARY AND CONCLUSIONS.	45
Recommendations	
APPENDIX ONE	50
BIBLIOGRAPHY	58

LIST OF TABLES

Table	Page
I. College Courses Taken by Athletic Trainers . . .	15
II. All-Star Teams Served by Trainers.	17
III. Membership of Trainers in Professional Organizations; and Clinics They Attend Regularly	18
IV. Types of Modalities Represented in the Study, the Number of Each, and Percentage of Trainers Who Have Each Type	19
V. Purchase Prices of the Modalities and Average Cost of Each.	22

CHAPTER I

INTRODUCTION

Physical activity has been a part of human existence since primitive man roamed the earth hunting many beasts for food while trying to escape from others as part of an endless struggle to survive. "To exist in his world demanded the utmost in survival skills, for which he needed a body trained to make effective use of each physical ability" (5, p. 15). He had to learn how to care for his body to keep it functioning effectively under the demanding conditions of survival.

The hunter could not permit minor injuries to keep him from the chase, or to prevent his flight from the beasts who were hunting him. He had to find methods of caring for injuries that would enable him to maintain his readiness to meet the rigors of his environment. His urgent need for means of speeding recovery impelled him to search for methods of promoting more rapid healing (7, p. 1).

His primitive need was met by the emergence of the soothsayer, medicine man, or shaman, whose function was to administer herbs and heat in some form, seeking " . . . to control natural processes by spells and other magical means acquired through long professional training" (7, p. 2).

As centuries passed, man's primary activity evolved from the primitive acts of survival to a broader range of activity including competitive endeavors such as the Olympic Games of

the Greeks. Since these early endeavors, athletic events have become more popular and more prevalent. With more emphasis being placed on physical ability, the participating athletes realized that they needed more competent care for their bodies than they themselves could give. This need gave rise to the gymnastes, men who trained professional Athenian athletes and " . . . employed a rudimentary knowledge of anatomy, physiology, and dietetics to keep the athletes in good condition" (5, p. 15).

Later, the medical gymnastai appeared on the scene. Their concern was with conditioning the athlete and maintaining him at a high peak of physical efficiency. Possessing some knowledge of diet, rest, and exercise and the effect that each has on physical development and performance, they made use of hot baths, massage, anodynes, and other measures (5, p. 15).

From the Greek athletic games centuries ago to the competitive organized individual and team sports we know in the world today, the need has remained for some form of specialist in the care of the athlete's body. In the early days of team sports in America, this specialist became known as the "trainer", but his image was not always good. "Years ago the trainer was the 'character' who hung around the dressing rooms imparting little knowledge but making many wise cracks" (2, p. 3). His function was to "rub" the athlete with his hands, sometimes using a salve that imparted a heating sensation to the skin. His only modalities were his hands, and very little of his work was based on scientific

principles. "However, the status of the trainer has progressed from the 'rubber' stage to that of a well-qualified member of a team composed of the coach, team physician, and trainer" (2, p. 3). The modern athletic trainer specializes in the management and rehabilitation of athletic injuries. If done correctly, this is a job which requires more than simply the use of the hands for "rubbing" as was often the case in the past.

The modern professional trainer now has the responsibility of handling certain electrical modalities such as the whirlpool, ultrasound machine, muscle-stimulator, short-wave diathermy, heat lamp, and vibrator massager in order to bring about a more rapid patient recovery and thereby help return the athlete to active competition.

The methods of using these modalities by athletic trainers are very similar to those methods of rehabilitation used by physical therapists. The therapist and trainer both attempt to bring about patient response by means such as moist heat, dry deep heat, and muscle stimulation through regular use of electrical machines designed for these purposes. The trainer limits his work strictly to athletics rather than to the broader scope of rehabilitation work undertaken by a registered therapist.

In recent years electrical modalities have come into widespread use among professional athletic trainers in the United States. The time factor is vital in rehabilitation

of athletic injuries; therefore, by correctly using the proper modalities, a competent trainer could theoretically get the athlete back to active participation in a minimum time.

This study dealt with the modalities of physical therapy as used by the professional trainers in Dallas and Tarrant Counties in the State of Texas.

Statement of the Problem

The study involved a survey of the selection, use, and maintenance of modalities of physical therapy by selected professional athletic trainers of high school, college, and professional athletic teams in the Dallas-Fort Worth area.

Definition of Terms

Physical therapy is a branch of the medical profession which, by producing certain beneficial effects, deals with restoration to normal of complete or partial loss of mechanical body function due to injury or disease.

Athletic injury is an abnormal disruption of normal tissue continuity which causes some degree of pain and/or loss of mobility to an individual resulting from participating in competitive exercises, sports, or games.

Modalities of physical therapy are the electrically-powered instruments used to aid rehabilitation of temporary functional body abnormalities and particularly of injuries.

Professional athletic trainer is a college educated male who is experienced in the prevention, care, and treatment of

injuries received by participants in competitive sports; and who is practiced in massage and techniques of physical therapy; and who receives a salary for his services in this field.

Maintenance of the modalities refers to the techniques and practices of upkeep for each modality as used by the athletic trainers included in the study.

Dallas-Fort Worth area is the geographical boundaries of Dallas County and Tarrant County in the State of Texas.

Purposes of the Study

The study was undertaken for the following purposes:

1. To determine which modalities of physical therapy were used by professional athletic trainers in the Dallas-Fort Worth area.
2. To determine criteria used by these trainers for the selection of the modalities.
3. To determine some of the conditions under which the trainers use each modality.
4. To determine methods employed by the trainers in maintenance of the modalities.

Limitations of the Study

The study was limited to data relative to selection, use, and maintenance of the modalities by professional athletic trainers of high school, college, and professional athletic teams in the Dallas-Fort Worth area.

Assumptions

Since the individuals included in the survey had acquired practical experience in the field of athletic training and held positions as professional athletic trainers, the assumption was made that they were qualified to furnish information for this study relative to selection, use, and maintenance of the modalities of physical therapy.

Survey of Related Literature

A survey of the literature revealed a limited amount of material related to the modalities of physical therapy used in athletic training. Most of the published material on the modalities was found in books dealing with the care and treatment of athletic injuries. These books were written by prominent professional athletic trainers, physicians, and educators in the United States.

Dayton (2) defined physical therapy as ". . . the employment of physical or other properties of electricity, massage, exercise, heat, light, cold water, and mechanical devices for the treatment of diseases and injuries" (2, p. 126). Several authors, including Dayton, Dolan (3), Thorn-dike (10), Klafs and Arnheim (5), and Morehouse and Rasch (7) have devoted sections of their books to descriptions and uses of various modalities of physical therapy.

Klafs and Arnheim (5) categorized the modalities into three groups: hydrotherapeutic modalities, thermotherapeutic modalities and electrotherapeutic modalities.

Hydrotherapeutic modalities included whirlpool baths, hydro baths, contrast baths, water percussion, steam baths, and heated air baths (5, pp. 197-198).

Thermotherapeutic modalities discussed in this book were heat applications, which could be placed on the injured area of the body. These included hot fomentations, hot packs, hot-water packs, and analgesic hot packs (5, pp. 197-198).

Electrotherapeutic modalities mentioned by Klafs and Arnheim were the infrared lamp, heat lamp, short-wave diathermy, microwave diathermy, ultrasound, muscle stimulator, and ultra-violet lamp (5, pp. 200-204).

Morehouse and Rasch (7) devoted a chapter of their book to "training facilities", in which they discussed several therapeutic apparatuses. Included in their discussions were the uses of the diathermy, muscle stimulator, whirlpool, hot steam pack (hydrocollator), infrared lamp, paraffin bath, ultrasound, and ultra-violet lamp.

Dolan (3), in his book on athletic injuries, included a short but somewhat detailed discussion of the diathermy as a modality, stating that "short-wave dilates the capillary system, both venous and arterial; thus bringing into the affected part an abundant supply of fresh arterial blood, and venous capillaries carrying out the inflammatory substances from the congested tissue" (3, p. 269).

Moore (6), in an article dealing with strains to the hamstring muscle group, stated that he used the whirlpool in

an effort to open the capillaries in the injured area in order to increase the flow of venous blood through the hamstrings (6, p. 38).

Whirlpool usage also was mentioned in articles by Randall (9) and Hansen (4).

Thorndike (10) emphasized the value of the modalities in returning the injured athlete to competition in a minimal time by saying, "much can be accomplished in shortening the period of convalescence through the scientific application of the proper modality of physical therapy" (10, p. 229). He felt that the whirlpool bath, the infrared lamp, and the micro-therm were important for managing the more common athletic injuries.

Novich (8) stated that "heat, exercises, ultrasound, and electrical muscle stimulator are the most important modalities" (8, p. 11). His article was unique in the fact that he specifically mentioned using the combination ultrasound-muscle stimulator modality for simultaneous muscle stimulation and ultrasonic therapy in treating athletic injuries.

Some books dealt entirely with the modalities, rather than primarily with athletic injuries. Watkin's Manual of Electrotherapy (11) contained chapters which discussed various forms of electric therapy including muscle stimulator, diathermy, whirlpool, heat lamp, paraffin bath, and ultra-sound. Another such book was the result of a symposium in which a

group of scientists presented studies concerned with various aspects of the use of the ultrasound in biology and medicine (1). This publication was of a technical nature, but did make reference to methods and techniques of application, dosage, and indications as well as contra-indications for ultrasound therapy (1, pp. 66-71).

CHAPTER BIBLIOGRAPHY

1. Aldes, J. H., Indications and Contraindications for Ultrasonic Therapy in Medicine, Publication 3 of Ultrasound in Biology and Medicine, edited by Elizabeth Kelly, Washington, D. C., American Institute of Biological Sciences, 1957.
2. Dayton, O. William, Athletic Training and Conditioning, New York, The Ronald Press Co., 1960.
3. Dolan, Joseph P., Treatment and Prevention of Athletic Injuries, Danville, Illinois, The Interstate Printers and Publishers, 1955.
4. Hansen, S., "High Quality-Low Cost Hydrotherapy," Scholastic Coach, XXXVII, (January, 1968), 64.
5. Klafs, Carl E. and Daniel D. Arnheim, Modern Principles of Athletic Training, St. Louis, The C. V. Mosby Co., 1963.
6. Moore, Steve, "Treating and Preventing Pulled Hamstring Muscles," Athletic Journal, XLVIII, (January, 1968), 38.
7. Morehouse, Laurence E., and Philip J. Rasch, Sports Medicine for Trainers, Philadelphia, W. B. Saunders Company, 1963.
8. Novich, Max M., "Physical Therapy for Athletic Injuries," The Journal of the National Athletic Trainers Association, (Summer 1966), 11-13.
9. Randall, H. B., "Use of the Whirlpool Bath for Injured Athletes," Journal of School Health, XXXVIII, (November, 1968), 620-1.
10. Thorndike, Augustus, Athletic Injuries-Prevention, Diagnosis and Treatment, Philadelphia, Lea and Febiger, 1956.
11. Watkins, Arthur L., A Manual of Electrotherapy, Philadelphia, Lea and Febiger, 1958.

CHAPTER II

PROCEDURES FOR COLLECTING DATA

Procedures which were used for the development of the study are presented in this chapter.

Sources of Data

The sources of data for the study were the twelve professional athletic trainers employed in the Dallas-Fort Worth area at the time of the study. They were employed by five high school systems, three universities, one professional football team, and one professional basketball team. Listed below are the schools and teams represented in the study:

1. Dallas Public Schools--Dallas, Texas.
2. Garland High School--Garland, Texas.
3. Lake Highlands High School--Richardson, Texas.
4. L. D. Bell High School--Hurst, Texas.
5. R. L. Paschal High School--Fort Worth, Texas.
6. Richardson High School--Richardson, Texas.
7. Southern Methodist University--Dallas, Texas.
8. Texas Christian University--Fort Worth, Texas.
9. University of Texas at Arlington--Arlington, Texas.
10. Dallas Chaparrals Basketball Club--Dallas, Texas.
11. Dallas Cowboys Football Club--Dallas, Texas.

Each of the preceding organizations had one trainer, with the exception of the Dallas Cowboys, who had two full-time professional trainers.

Construction of the Interview Guide

The basic procedure for collection of data for this study was by a personal visit with each participant. This procedure was selected in an effort to increase the consistency of data collection. To facilitate the interview, an interview guide was constructed which was designed in such a way that the responses could, for the most part, be checked off quickly rather than written out. (A copy of the interview guide may be found in Appendix One).

After the interview guide had been constructed and approved, each trainer in the Dallas-Fort Worth area was contacted by telephone and asked if he would consent to an interview. All twelve trainers agreed to a date, time, and place for the interview. These interviews took place during the spring and summer months of 1968. The general atmosphere during these interviews was casual and relaxed in every case.

CHAPTER III

PRESENTATION OF DATA

The professional athletic trainer is an individual whose job necessitates some knowledge of the structure and function of various parts of the human body. This knowledge is utilized by the trainer, while the team physician often adds his knowledge and skills, in sharing with the trainer the responsibility for diagnosis and treatment of athletic injuries. In acquiring knowledge of the human body, the prospective trainer could take college courses in human anatomy, physiology, and kinesiology. These studies could open avenues of understanding relative to locations and functions of various organs, tissues, and organ systems. Other areas of study such as corrective physiology, hygiene, physiology of exercise, and bacteriology could contribute to the trainer's understanding of the human mechanism. Such background knowledge could aid the athletic trainer by serving as a basis upon which to skillfully handle athletic injuries as well as to communicate intelligently with the team physician regarding such injuries.

In addition to the trainer's educational background, his practical experience can be of significant value. By repeatedly working with actual injuries, he might possibly

see patterns of response which could aid in future management of similar injuries. Acquisition of such practical knowledge could be obtained by working with more experienced trainers; by working with injuries incurred by athletes in a variety of sport fields; or by working in environments other than the trainer's own training room. Thus, a conscientious athletic trainer with both a good educational background and a record of experience to his credit can be a valuable asset to an athletic program.

Educational Background of the Trainers

All the trainers included in the study had completed college work in areas related to athletic training. One trainer had four years of college work but no degree, while the other eleven all held the bachelor's degree. Of these eleven trainers, five had earned master's degrees, and two held certification in physical therapy. Physical education and biology were the primary areas of study on both the undergraduate and graduate levels. At the undergraduate level ten trainers majored in physical education and two majored in biology. Undergraduate minors included biology, physical education, social studies, science, and education. On the graduate level, the major fields of study were physical education, biology, and administration.

Few colleges and universities offer degrees in athletic training; however, many schools offer courses related either

directly or indirectly to this field. Investigation of specific courses completed by the trainers revealed that their educational backgrounds, as indicated by these courses, were somewhat varied. Table I shows information relative to the courses completed by the trainers.

TABLE I

COLLEGE COURSES TAKEN BY ATHLETIC TRAINERS

Course Taken by Trainers	Per Cent Taking Course	Course Taken by Trainers	Per Cent Taking Course	Course Taken by Trainers	Per Cent Taking Course
Anatomy & Physiology	100%	Corrective Physiology	50%	Post-Surgical Rehabilitation	8%
Tests and Measurement	92%	Hydrotherapy	17%	Muscle Testing	8%
First Aid	92%	Electrotherapy	17%	Applied Anatomy	8%
Athletic Injuries	83%	Bacteriology	17%	Neuroanatomy	8%
Physiology of Exercise	83%	Medical Terminology	17%	Pathology	8%
Kinesiology	75%	Sports Medicine	8%	Gait Training	8%
Hygiene	75%	Massage	8%	Histology	8%

Practical and Professional Experience
of the Trainers

In addition to academic work related to athletic training, an invaluable source of knowledge to the trainer is his

experience in the field. Most of the trainers included in the study served as student trainers prior to becoming professionals. Only two did not work as student trainers, while four served as student trainers in both high school and college, and six worked in this capacity at the college level only. The twelve high school, college, and professional athletic team trainers represented a total of ninety-two years experience in the field, an average of seven and seven-tenths years experience per man. Professional experience of the trainers ranged from a minimum of one year by each of three high school trainers to a maximum of twenty-four years by one of the college trainers.

In addition to the experience gained by working each day at their regular jobs, some professional trainers may be given the honor and experience of working with all-star teams as a reward for competence, dedicated work, and the reputation they have built. Several area trainers had served all-star teams of some type, as shown in Table II.

Treatment techniques for athletic injuries may become updated with each new season. Throughout each year there are lectures, clinics, conventions, and other meetings which serve to present the trainer with the up-to-date ideas and techniques used by others in the field. Another way the trainer may stay abreast of current trends is through membership in professional organizations. Such organizations

TABLE II

ALL-STAR TEAMS SERVED BY TRAINERS

All-Star Team	Number of Trainers	Per Cent of Total
High School All-Star Football Games*	3	25%
United States Olympic Team	2	17%
National Football League East-West Shrine Game	1	8%
Texas League Baseball All-Star Game	1	8%
National Football League Pro Bowl Game	1	8%
College All-Star Football Game	1	8%

*Includes high school all-star football games in Texas, Oklahoma, New Mexico, Kansas, California, and Wyoming.

periodically distribute literature with current information related to athletic training, and hold annual meetings at which prominent people in the field are invited to speak and demonstrate their techniques. Most of the trainers in the study belonged to professional organizations, and regularly attended clinics or conventions which related to the field of athletic training. The professional organizations to which the trainers belonged and the meetings they attended regularly are presented in Table III.

TABLE III

MEMBERSHIP OF TRAINERS IN PROFESSIONAL ORGANIZATIONS;
AND CLINICS THEY ATTEND REGULARLY

Professional Organization	Per Cent Belonging to Organization	Meeting Attended Regularly	Per Cent Attending Meeting Regularly
National Athletic Trainers Association	83%	National Athletic Trainers Convention	58%
Southwest Athletic Trainers Association	75%	Southwest Trainers Injury Clinic	66%
American Physical Therapy Association	17%	Eastern Athletic Trainers Clinic	17%
American Registry of Physical Therapists	8%	No. Central Texas Student Tr. Clinic	25%
American National Red Cross	8%	Nat'l. Association of Team Physicians Seminar	17%

Selection of the Modalities

In order to facilitate the management of athletic injuries, the modern trainer uses some of the modalities which are commonly employed by physical therapists. With the present-day specialization in the management of athletic injuries, the techniques of athletic training have become increasingly more sophisticated. This is evidenced in part by the trainer's use of electrical modalities and also by the fact that some modalities are now designed to meet the needs of the trainer as well as the physical therapist.

The trainers in this area employed nine types of physical therapy machines; however, none of them had all nine types in his training room. The greatest number of modalities in any one training room was eight, and the least number was two. Some trainers had more than one unit of a particular modality and in some cases, of several modalities. The types of machines along with the total number of units and the percentage of trainers who have each machine are presented in Table IV.

TABLE IV

TYPES OF MODALITIES REPRESENTED IN THE STUDY,
THE NUMBER OF EACH, AND PERCENTAGE OF
TRAINERS WHO HAVE EACH TYPE

Type of Modality	Total Number of Units Represented in the Study	Percentage of Trainers Who Have This Modality
Whirlpool	20	100%
Ultrasound	12	83%
Muscle Stimulator	12	83%
Hot Steam Pack Unit	11	75%
Vibrator Massager	8	50%
Combination Ultrasound-Muscle Stimulator	6	50%
Short Wave Diathermy	5	42%
Heat Lamp	4	33%
Electric Traction Unit	2	25%

The trainers in the study indicated that a number of features were important in the selection of modalities. One of these features was the economy of the purchase price of each modality. In choosing modalities, the trainers selected machines for which the initial costs were economical compared to their value in the training rooms. Economy of usage time as well as operating costs were also considered important factors in selecting modalities. Repair work and replacement of parts were expected, but the trainers indicated that the machines they selected should be durable enough to withstand normal usage without frequent repairs or replacements being made.

The trainers indicated that their time was valuable; therefore, they preferred modalities which required little time to prepare for use, and to clean. They also favored machines that were versatile. This criterion required that machines be adaptable to treatments of various body areas and to various effects sought by their use.

Another factor considered in the selection of a modality was the safety to both the operator of the machine and the athlete being treated. The trainers also considered whether a particular unit of a modality had adequate size to perform its intended function in their particular environments.

In some cases trainers preferred specific brands in choosing modalities due to favorable past experiences with machines made by a particular manufacturer.

Comments relative to these criteria indicated that fifty per cent of the trainers felt that their whirlpools were not purchased economically, and some felt that the drains built into their whirlpools made them difficult to clean. Also over fifty per cent of the trainers who had an ultrasound machine indicated that repairs on it presented some difficulty.

A considerable expense could be involved in purchasing complex electrical modalities. This expense could constitute a major portion of the budget. Trainers in any athletic program, no matter what the budget, are usually interested in obtaining the best product for the money. Investigation of the initial cost of each machine revealed that not only did the cost of the machines vary widely, but also that there was a wide variance in the cost of each type unit. Information relative to the approximate initial cost of the various types of machines was gathered. For the total number of units of each modality the highest and lowest initial prices, along with the average initial cost, are presented in Table V.

The wide variance in prices for some of the modalities was due to the different size units in use in some of the training rooms. Some units were smaller in size than others; therefore, the price was not as great. The average cost shown includes all the units of that kind included in the study.

Operation of some of the machines required more technical training than others. The trainer should be thoroughly

TABLE V

PURCHASE PRICES OF THE MODALITIES
AND AVERAGE COST OF EACH

Modality	Greatest Initial Price	Lowest Initial Price	Average Initial Cost
Short Wave Diathermy	\$1065.00	\$200.00	\$528.00
Combination Ultrasound-Muscle Stimulator	944.00	600.00	681.50
Whirlpool	865.00	40.00	450.00
Muscle Stimulator	700.00	90.00	433.00
Ultrasound	700.00	250.00	583.00
Hot Steam Pack Unit	600.00	40.00	132.00
Electric Traction Unit	400.00	375.00	387.00
Vibrator Massager	100.00	12.00	50.00
Heat Lamp	80.00	35.00	50.00

familiar with the basic operational principles of certain machines in order to use them safely and effectively. Timing devices, wattage adjustments, electric current intensity indicators, and current frequency indicators all should be handled intelligently by the trainer to avoid possible harmful effects to both himself and to the patient. According to Dayton, " . . . a simple application of heat, if improperly administered, may result in a severe burn that will be more disabling than the injury initially treated" (1, p. 126).

Misuse of these regulatory devices could bring about superficial or deep tissue damage which could be permanent in nature.

The trainers in the study acquired the knowledge to operate these modalities in one or more of several ways. For some of the modalities, the use of operating manuals and instructional materials from the manufacturer was adequate. For the more complex machines, the trainer learned by working under the supervision of more experienced trainers, and in some cases special training by factory representatives was required. In a few cases, trainers received instruction in schools of physical therapy. Each of the trainers revealed that at one time or another he had used one or more of the above methods to improve his understanding of the operation of his machines and of their use in rehabilitation.

Use of the Modalities

During the interview a selected group of injuries common to athletics was presented to each trainer. He had the opportunity to add to the list of injuries, after which he gave information relative to treatment of each type of injury. These injuries were arbitrarily chosen for presentation to the trainer as a result of investigation into several sources dealing with athletic training. The injuries were divided into three categories for purposes of this study: soft-tissue injuries, bone injuries, and joint injuries.

The soft-tissue injury group included skeletal muscle strains, thigh contusions ("charley horse"), hematomas, and shin splints. Bone injuries included fractures and bone bruises, while the joint injury group covered sprains, hyperextensions, dislocations, knee ligament injuries, knee cartilage injuries, and acromioclavicular separations. Whereas most of the injuries listed could occur in any bone, joint, or major muscle area of the body, some of the injuries were specifically named because of their frequent occurrence to a particular body part, or to their unique occurrence to the area named.

The acromioclavicular separation was listed because it is an injury common to athletics that affects only the shoulder region. Trickett states that "the most common sports injuries of the shoulder are probably acromioclavicular separations, referred to more commonly as 'shoulder separations'" (3, p. 92). Similarly, in regard to shin splints (a common affliction to the lower leg in athletics), Klafs and Arnheim state ". . . the condition occurs frequently among athletes, generally at the start and at the end of the season . . . 'Shin splints' are usually attributed to overuse of the anterior tibial muscles" (2, p. 61). Other specific injuries included were ankle sprains and knee injuries, which are very common to athletic competition. Dayton states, "Perhaps the most common injury to the lower extremity in athletics is the ankle sprain" (1, p. 341). Injuries to the knee were classified according to cartilaginous damage

(medial or lateral meniscus), or ligamentous damage (collateral or cruciate ligaments), in order to allow the trainer to indicate methods of treatment unique to each type of injury. Trickett states, "It is safe to say that the knee is the most troublesome joint in football, if not all sports" (3, p. 103).

Many high schools have a team physician who can diagnose and prescribe therapy for these injuries. Almost all college and professional athletic teams maintain the services of a qualified doctor who is responsible for determining the diagnosis, severity, and therapeutic measures for injuries to athletes. The trainer often seeks the advice of a physician, and acting upon this advice, may use one or more of the modalities for treatment of an injury. Consultation with a doctor may also aid the trainer in knowing when to treat the injury with a modality, what beneficial effects to attempt at the site of the injury by use of a modality, and whether or not to use a modality for rehabilitation in conjunction with the athlete's exercise.

Data were collected relative to these aspects of the use of modalities by the trainers. They used certain modalities on specific injuries only after a given amount of time following the injury; they used the modalities to attempt certain beneficial effects in an effort to enhance the healing process; and they used the modalities in conjunction with exercise when exercise was indicated as part of the athlete's therapy routine.

The information regarding the use of a modality after a given amount of time since the occurrence of the injury was approached from three aspects: use of a modality immediately after the occurrence of the injury (within twenty-four hours); use of a modality between twenty-four and forty-eight hours after the occurrence of the injury (early treatment); and use of a modality forty-eight hours or more after the occurrence of the injury (later treatment).

None of the trainers reported using a modality immediately after the occurrence of any injury (within twenty-four hours). Therefore, in the discussion of the time aspect, only the early and later treatments are reported.

By treating certain injuries with the modalities each trainer attempted to bring about certain beneficial effects within the body, especially at the site of the injury, in order to enhance the healing of that particular injury. The trainers were asked to indicate what they intended to accomplish by use of specific modalities on specific injuries. The modalities were used most often in efforts to provide increased blood circulation, heating of surface body tissues, heating of deeper body tissues, relaxation, reduction of stiffness, reduction of swelling, breakage of adhesions, and alleviation of pain. Some trainers also reported using certain modalities as an aid to manual massage.

During the athlete's period of rehabilitation, exercise is often permitted, or even encouraged. Data were collected

relative to the use of the modalities in conjunction with exercise. In some cases the modalities were used either immediately prior to, or immediately after periods of exercise. In other cases, some trainers treated certain injuries therapeutically both immediately before and immediately after the athlete engaged in physical activity.

Use of the modalities relative to passage of time after the injury occurred, to the beneficial effects sought by the use of each and to exercise is presented in the following discussions.

Use of the Whirlpool Modality

The whirlpool was the most widely used modality in the study from the standpoint of the number of trainers using it and the number of injuries treated by a modality. All twelve trainers in the study used this modality.

Injuries treated by the whirlpool modality.--At least fifty per cent of the trainers reported using this modality for the treatment of sprains, knee ligament injuries, knee cartilage injuries, hyperextension injuries, fractures, muscle strains, and bone bruises. Some of the trainers also used the whirlpool for treatment of shin splints and thigh contusions, while none of them reported using this modality to treat the acromioclavicular separation. The trainers indicated that the shoulder area was somewhat difficult to

place into the whirlpool and favored other forms of therapy for the acromioclavicular separation.

Passage of time after injury.--This modality was used primarily as a later form of treatment in the care of most injuries. Very few trainers reported using the whirlpool as an early form of treatment, but five trainers did report using it as early therapy for shin splint conditions.

Use of the whirlpool in conjunction with exercise.--The whirlpool was used in conjunction with exercise for rehabilitation of several injuries. At least six trainers often treated muscle strain, bone bruise, and hyperextension injuries both immediately before and after exercise during the athlete's rehabilitation period.

Beneficial effects sought by the use of the whirlpool.--By using the whirlpool on certain injuries, the trainers were seeking to induce such effects in the injured area as increased blood circulation, relaxation of the involved body part, reduction of stiffness and/or swelling, and superficial heating. In the treatment of muscle strains, sprains, and hyperextensions, all the trainers felt that increased blood circulation was necessary; and that the whirlpool could help accomplish this effect. Over half the trainers expressed the same opinion relative to the treatment of thigh contusions, knee injuries, fractures, shin splints and bone bruises by

the whirlpool. All twelve trainers indicated that reduction of stiffness was important in the treatment of muscle strains, and felt the whirlpool could help accomplish this effect. At least half of the trainers reported using the whirlpool in order to attempt reduction of swelling associated with muscle strains, sprains, and hyperextensions. Relaxation of the injured body area was sought by at least half of the trainers on knee injuries, hyperextensions, and muscle strains.

The majority of trainers did not try to use the whirlpool for heating the deeper tissues of the body, but several indicated that they used it to attempt superficial heating on some soft-tissue injuries.

The whirlpool was also used prior to massage in treatment of muscle strains by over half the trainers in the study.

Use of the Ultrasound Modality

Ten of the twelve trainers in the study had the ultrasound modality in their training rooms. It was found to be useful on a number of soft-tissue and joint injuries.

Injuries treated by the ultrasound modality.--Of the ten trainers, five or more reported that they used it for treatment of muscle strains, acromioclavicular separations, thigh contusions, shin splints, hematomas, and all types of sprains. This modality was seldom used for treatment of knee injuries, dislocations, and hyperextensions; and almost never used for

treatment of fractures. Only one trainer reported using the ultrasound for treating fractures, but it was used by more than one trainer for treatment of all other injuries mentioned.

Passage of time after injury.--The ultrasound was used mainly as a later form of treatment for most injuries. This was especially true in the management of all types of sprains as five or more trainers indicated its use at least forty-eight hours or more after the injury. Few trainers reported using the ultrasound as an early form of treatment.

Use of the ultrasound in conjunction with exercise.--Sprains were the only type of injury treated with ultrasound in conjunction with exercise. Seven trainers reported that they used this modality for treatment of sprains both before and after the athlete's exercise period.

Beneficial effects sought by the use of the ultrasound modality.--The primary effects attempted by use of the ultrasound were to heat the deeper body tissues, to increase the circulation of blood to the injured area, to ease pain, and to reduce stiffness. Nine trainers felt it was beneficial to heat the deep tissues in treating muscle strains and acromioclavicular separations, and sought these effects by using ultrasound therapy. Over half the trainers sought this effect on all soft-tissue injuries treated with ultrasound. Five or more trainers attempted to increase the blood flow and to ease the pain associated with soft-tissue injuries. Several

trainers felt that the stiffness manifested in injuries such as acromioclavicular separations, sprains, and all soft-tissue injuries could be reduced by use of the ultrasound modality. Over half the trainers sought to reduce the swelling associated with muscle strains and acromioclavicular separations by ultrasound therapy. Few trainers used this modality for surface heating effects, or for relaxation to the injured area.

Use of the Hot Steam Pack Modality

The hot steam pack unit was utilized by nine of the twelve trainers. It was more widely used for treatment of soft-tissue injuries than any other type injury.

Injuries treated by the hot steam pack modality.--Hot packs were used for treatment of all soft-tissue injuries, and for joint injuries such as acromioclavicular separations, dislocations, and knee injuries. Of these joint injuries, the hot pack was most frequently used on the acromioclavicular separation. Only a few of the trainers reported using hot packs as therapy for knee injuries, and none indicated use on ankle sprains.

Passage of time after injury.--This modality was most often utilized forty-eight hours or more after the occurrence of each injury. At least five of the trainers reported later use of the hot packs on all soft-tissue injuries as well as acromioclavicular separations and dislocations.

Use of hot steam packs in conjunction with exercise.--

Few trainers reported using this modality in conjunction with exercise.

Beneficial effects sought by the use of the hot steam pack modality.--Effects sought by the use of hot steam packs were increased blood circulation, reduction of stiffness and swelling, and heating of surface tissues. All nine trainers having this modality reported that by using it on muscle strains and thigh contusions, they were trying to increase the circulation of blood through the area. Also, they all reported using it in an effort to reduce the stiffness associated with muscle strains. Surface heat was a desirable effect according to six trainers, especially in treating the soft-tissue injuries. As many as seven trainers used hot steam packs to try to reduce the swelling associated with hematomas and six attempted to accomplish this with muscle strains and thigh contusions.

The hot packs were also used as an aid to massage by over half the trainers in treating most soft-tissue injuries.

Use of the Muscle Stimulator Modality

Ten trainers utilized the muscle stimulator modality, in most cases, for treatment of various soft-tissue injuries rather than bone or joint injuries.

Injuries treated by the muscle stimulator modality.--

The muscle stimulator was most frequently used to treat muscle

strains and thigh contusions. Some used it for treatment of hematomas. Only a few trainers used this modality for treatment of shin splints, while just one reported using it with sprains.

Passage of time after injury.--This modality was used almost exclusively as a later means of therapy in the management of the above injuries.

Use of muscle stimulator in conjunction with exercise.--This modality was not frequently used by the trainers in conjunction with an athlete's physical exercise program during his rehabilitation.

Beneficial effects sought by use of the muscle stimulator modality.--One of the primary effects the trainers were seeking through use of this modality was to increase the circulation of blood through the site of the injury. All ten trainers reported they sought to do this by using the muscle stimulator on muscle strain injuries. For treatment of soft-tissue injuries other than shin splints, six or more trainers used the modality to attempt increased circulation. Relaxation at the site of the injury was sought by over five trainers for the treatment of these injuries, and as many as nine used the modality to try to reduce the stiffness that accompanied such injuries. Some of the trainers also reported attempting to break adhesions associated with muscle strains and thigh contusions.

Use of the Combination Ultrasound-Muscle Stimulator Modality

The combination ultrasound-muscle stimulator utilizes both ultrasonic wave therapy and major muscle-group stimulation simultaneously. This modality was used by six of the twelve trainers in the study.

Injuries treated by the combination ultrasound-muscle stimulator modality.--Combination therapy was used by the trainers primarily for treatment of muscle strains, hyperextensions, dislocations, and acromioclavicular separations. Few trainers used it to treat any of the other injuries, and none used it for treatment of knee injuries.

Passage of time after injury.--The combination ultrasound muscle stimulator was not used as a means of treatment until at least forty-eight hours after each injury had occurred. None of the trainers used this modality as an early form of therapy.

Use of the combination ultrasound-muscle stimulator in conjunction with exercise.--None of the trainers reported using the combination ultrasound-muscle stimulator in conjunction with exercise while rehabilitating injured athletes.

Beneficial effects sought by use of the combination ultrasound-muscle stimulator modality.--The primary effects sought by use of the combination ultrasound-muscle stimulator for treatment of injuries were increased circulation of blood

through the injury site, relaxation of the area, and reduction of stiffness. All six trainers indicated that, by use of the modality on muscle strains, hyperextensions, and dislocations, they were attempting to increase circulation and promote relaxation at the injury site. For the treatment of muscle strains and acromioclavicular separations in particular, the six trainers also indicated they were attempting to reduce stiffness by use of this modality.

Use of the Short Wave Diathermy Modality

Five trainers reported using the short wave diathermy modality for treatment of injuries.

Injuries treated by the short wave diathermy modality.--

Short wave diathermy therapy was most often used for treatment of bone injuries such as fractures and bone bruises, and joint injuries such as dislocations and acromioclavicular separations. However, some soft-tissue injuries were treated with diathermy, the most prevalent of which was muscle strains. Few trainers used this modality for treatment of sprains or knee injuries.

Passage of time after injury.--The short wave diathermy was used by all five trainers as a later form of therapy for treatment of injuries.

Use of the short wave diathermy in conjunction with exercise.--Few trainers reported using the short wave diathermy modality in conjunction with exercise.

Beneficial effects sought by the use of the short wave diathermy modality.--All five trainers indicated they were attempting to reach the deeper tissues for heating effects and to increase the circulation of blood in the area by use of the short wave diathermy on the various bone or joint injuries treated. Three trainers reported using the diathermy on muscle strains to try to promote increased blood circulation, heating of deeper tissues, and reduction in stiffness at the site of the injury.

Use of the Heat Lamp Modality

The heat lamp was not widely used by the trainers included in the study. Four trainers owned heat lamps, but only one reported extensive use of the modality.

Injuries treated by the heat lamp modality.--The heat lamp modality was used exclusively on soft-tissue injuries. None of the trainers reported using it for bone or joint injuries.

Passage of time after injury.--Heat lamp therapy was administered as a later form of treatment on the soft-tissue injuries. None of the trainers reported using heat lamp therapy as early treatment.

Use of the heat lamp in conjunction with exercise.--The heat lamp was not reported to be used by any trainer in conjunction with exercise.

Beneficial effects sought by use of the heat lamp modality.--The trainer who most frequently used this modality indicated that by its use on soft-tissue injuries he was attempting to increase the circulation of blood through the area by heating the surface tissues. On muscle strains in particular, a reduction of stiffness was also sought by use of the heat lamp.

Use of the Vibrator Massager Modality

The vibrator massager was owned by six of the trainers in the study, but it was not widely used in treatment of injuries.

Injuries treated by the vibrator massager modality.--The vibrator massager was used for the treatment of all soft-tissue injuries, but was most frequently used with muscle strains and thigh contusions. It was seldom used with bone or joint injuries.

Passage of time after injury.--The vibrator massager was used more in the twenty-four to forty-eight hour time period after the injury than as a later form of treatment.

Use of the vibrator massager in conjunction with exercise.--This modality was used very little in conjunction with exercise.

Beneficial effects sought by use of the vibrator massager modality.--At least half the trainers with this

modality were seeking to increase blood circulation by using it on most soft-tissue injuries. All six trainers used it on muscle strains in an effort to reduce stiffness and as an aid to massage.

Use of the Electric Traction Modality

This modality was used by only three trainers. Two of the trainers shared the same training room; therefore, only two electric traction units were represented in the study.

Injuries treated by the electric traction modality.--

The use of the electric traction unit was limited to injuries of the neck. The neck injuries treated by use of this modality were muscle strains and hyperextensions.

Passage of time after injury.--This modality was used exclusively as a later treatment for the neck injuries mentioned above.

Use of the electric traction modality unit in conjunction with exercise.--This modality was not used by the trainers in conjunction with exercise while rehabilitating athletes.

Beneficial effects sought by use of the electric traction modality.--The trainers indicated that the most sought after response by use of this modality was relaxation of the muscles in the neck. It also was used by two of the trainers as an aid to massage.

Maintenance of the Modalities

Data were collected concerning maintenance and repair of each of the machines. The trainers were asked to indicate specifically how often and by what methods they cleaned each machine. The responses ranged from simply dusting the machine to the use of specialized cleaning agents. In some cases, repairs were made by the trainer himself, whereas in others a specialist was utilized, either by bringing him in to the training room, or by sending the machine or its parts to him. Information concerning maintenance included frequency of lubrication, removal of parts for cleaning, replacement of parts, checking the ground wire, and adjustment of regulatory devices unique to that machine.

Maintenance of the Whirlpool Modality

The majority of the twelve trainers owning whirlpools reported cleaning them once each day. Cleaning procedures varied with some trainers, but cleaning was restricted to surface areas only.

Most of the trainers reported that when repairs were necessary, a specialist was called in for the job. Some of the trainers indicated that when possible, they sent the parts needing repair to the manufacturer. In other cases, parts were ordered from the manufacturer to be placed on the machine by either the trainer himself or by a specialist.

The majority of trainers reported that their whirlpools required relatively little attention to keep them in good

working order. They indicated that lubrication was seldom necessary and that replacement of parts for this modality was not often required.

Maintenance of the Ultrasound Modality

The ultrasound modality was most often cleaned simply by wiping surface areas such as the sound head and the metal cabinet. All trainers cleaned this machine at least once a day. Due to the complexity of the machine, all trainers either required a specialist to repair the machine or sent it to the manufacturer for this service. Lubrication was seldom needed, and parts were not frequently removed or replaced. General maintenance by the trainer was not extensive for the ultrasound modality.

Maintenance of the Hot Steam Pack Unit

The metal cabinet housing the hot steam packs was reportedly cleaned once a week by a majority of the trainers who used this modality. This metal cabinet was cleaned most often by use of disinfectants and special cleaning agents. The packs themselves were not frequently cleaned, but the water in which they rest was periodically changed by all the trainers. Some trainers repaired this modality by more than one method. Several reported they made repairs themselves at times, but there were times they felt it necessary to bring in a specialist. Five trainers always sent their units to the manufacturer or its representative when repairs were needed.

The majority of the trainers reported that this modality never needed lubrication, and that parts seldom needed replacement. Since it has no moving parts, the primary concern of the trainer in maintenance of this modality was in keeping it clean and free of corrosion.

Maintenance of the Muscle Stimulator Modality

The sponge pads which are applied to the skin for treatment near the site of the injury are the essential working parts of this modality. A majority of the trainers cleaned these pads at least once a week. Most trainers usually cleaned them with a damp cloth; however, it was indicated that soapy water and disinfectants were occasionally used. A majority of the trainers reported they either sent their unit off for repairs or called in a qualified person.

This machine demanded only a small amount of effort for general maintenance. Half the trainers reported that it was necessary to check the ground wire frequently, since the function of this machine is electrical stimulation to the muscles, and improper grounding could be dangerous to both trainer and athlete. Otherwise, few regulations were necessary in maintaining the proper function of this machine.

Maintenance of the Combination Ultrasound-Muscle Stimulator

A majority of the trainers having this modality cleaned it daily simply by going over the surface area with a cloth.

Most trainers called in a specialist for repair work, but in some cases the machine or its damaged parts were sent to the manufacturer for repairs.

Lubrication, removal or changing of parts, or regulatory adjustments were seldom necessary for this modality.

Maintenance of the Short Wave Diathermy Modality

This comparatively large modality was cleaned once weekly by most users. The trainers used a variety of methods to clean their diathermy machines, but in all cases, cleaning consisted of simply removing dirt from surface areas of the machine.

None of the trainers attempted to make repairs themselves on this machine, as all felt it was necessary to bring in a specialist for this work. In addition, four trainers stated that at one time or another they had sent the machine or its parts needing repair to the manufacturer.

This machine seldom needed to be lubricated, or checked at the ground wire attachment. Also, parts were durable enough to withstand long use, and regulatory adjustments were infrequent.

Maintenance of the Heat Lamp Modality

This modality was used frequently by only one of the trainers. He cleaned it each day, while the other trainers reported they seldom cleaned their units. For cleaning, the heat lamp needed only to be dusted. Three trainers reported

that they were able to make repairs themselves in most cases, while one trainer used the services of a professional repairman for this machine.

This modality had no moving parts, and very little maintenance was necessary for it other than cleaning.

Maintenance of the Vibrator Massager Unit

This modality did not need frequent cleaning, and the cleaning methods consisted of simply wiping surface areas of the machine. Some trainers reported that they sent it to the manufacturer for repairs, while the others called in a specialist. Lubrication was not often necessary and replacement of parts or regulatory adjustments were seldom needed for the vibrator massager.

Maintenance of the Electric Traction Modality

Of the three trainers who owned this modality, two reported cleaning it each day, and one cleaned it once a month. Surface areas of this machine were cleaned by dusting and using special cleaning agents. All three trainers brought in specialists to repair the traction unit, but one also reported that he had sent his unit to the manufacturer for repairs on at least one occasion.

Parts had to be removed frequently for cleaning, and regulatory adjustments were often necessary in the operation of this machine.

CHAPTER BIBLIOGRAPHY

1. Dayton, O. William, Athletic Training and Conditioning, New York, The Ronald Press Co., 1960.
2. Klafs, Carl E., and Daniel D. Arnheim, Modern Principles of Athletic Training, St. Louis, The C. V. Mosby Co., 1963.
3. Trickett, Paul C., Prevention and Treatment of Athletic Injuries, New York, Appleton-Century-Crofts, 1965.

CHAPTER IV

SUMMARY AND CONCLUSIONS

The twelve professional athletic trainers located in Dallas and Tarrant Counties of Texas were interviewed for data relative to the selection, use, and maintenance of electrical therapeutic modalities. Nine types of modalities were used by these trainers. They were the whirlpool, the ultrasound, the hot steam pack unit, the muscle stimulator, the short wave diathermy, the combination ultrasound-muscle stimulator, the vibrator massager, the heat lamp, and the electric traction unit. The number of trainers owning each modality varied from twelve who had the whirlpool to three with the electric traction unit. The number of modalities per training room ranged from a maximum of eight to a minimum of two.

The trainers in the study had all completed at least four years of college, and eleven held the bachelor's degree. Five trainers held the master's degree and two had also obtained certification in physical therapy.

Experience of the trainers varied from service as student trainers during their high school and undergraduate years to service as the trainer for all-star athletic teams. In addition, the trainers reported membership in various

professional organizations and regularly attended clinics, conventions, and other professional meetings.

Criteria for selection of the modalities included the economy of purchase, use, and maintenance; the safety aspect of operation; the adequacy of size; and versatility of each machine. The trainers indicated that, as a whole, the modalities were quite adequate when evaluated using these criteria.

For this study injuries were classified according to three general types. The modalities were used for treatment of soft-tissue injuries, bone injuries, and joint injuries. Data were collected relative to when each modality was used after the onset of an injury; to the use of a modality in conjunction with the physical activity of an athlete during his rehabilitation period, and to the beneficial effects being attempted by the trainer while using a particular modality on specific injuries. None of the modalities were used within twenty-four hours of the injury, whereas the majority were used as later treatment (forty-eight hours or more after the injury). The modalities were not widely used in conjunction with exercise. Most of the trainers who employed this method of rehabilitation for injuries treated the athlete both before and after he exercised. Beneficial effects sought by use of the modalities were varied, ranging from simple surface heating to major muscle stimulation.

The whirlpool was the most widely used modality from the standpoint of the number of trainers using it, the range of effects sought by its use, and the number of injuries treated. Certain modalities had more practical application than others, being used for several types of injuries, while the use of some was limited to only a few injuries. The electric traction unit and the heat lamp were used less frequently than any of the other modalities.

The survey of maintenance procedures revealed that the modalities required relatively little upkeep. Methods of general maintenance such as cleaning the machines were reasonably simple and required little time. Repairs were handled by the trainer himself in some instances, but in many cases, a specialist was employed for this work.

All of the professional trainers in the Dallas-Fort Worth area used modalities of physical therapy to aid in the management of athletic injuries. Each trainer revealed that he attempted to induce certain beneficial effects within the body while treating various injuries with the modalities. Some of the trainers felt that the modalities were helpful during the athlete's rehabilitation period by their application to injuries in conjunction with exercise.

The whirlpool modality was used by all twelve trainers, and was most widely represented in the study from the standpoint of number of units (twenty). This modality was used to treat a greater number of injuries (ten) than any of the

others, and the trainers felt that it was capable of inducing a wider variety of beneficial effects (five) than any other single modality.

The electric traction unit was owned by fewer trainers in the study than any other modality. Its use by the trainers was limited to only one area of the body, the neck, and to only two types of neck injuries. The bodily effects attempted by its use could probably be accomplished by using another form of therapy such as muscle stimulation or ultrasound treatments.

The conclusions based on the findings of this study revealed that some modalities of physical therapy were beneficial to athletic trainers, that the whirlpool was the most versatile of the modalities included in this study, and that the electric traction unit was not an essential part of the trainer's equipment.

Recommendations

The following recommendations were made from the data presented in the study:

1. That such factors as economy of purchase, use, and maintenance; safety to both the patient and the trainer; and necessary procedures for upkeep should be considered before purchasing a modality for an athletic program.

2. That the whirlpool should be the first modality selected for use in the athletic program with a limited budget.

3. That the muscle stimulator and heat lamp modalities should be used for treatment of soft-tissue injuries only.

4. That none of the modalities should be used for treatment within twenty-four hours of any injury.

5. That the combination ultrasound-muscle stimulator, short-wave diathermy, heat lamp, and electric traction modalities should be used only as later forms of therapy for the treatment of injuries.

APPENDIX ONE

INTERVIEW GUIDE

GENERAL INFORMATION:

NAME _____ TEAM _____

POSITION _____

LENGTH OF TIME IN PRESENT POSITION _____

LENGTH OF TIME IN THIS FIELD OF WORK _____

COLLEGE ATTENDED _____ DEGREE _____

COLLEGE ATTENDED _____ DEGREE _____

UNDERGRADUATE MAJOR _____ MINOR _____

GRADUATE MAJOR _____ MINOR _____

PHYSICAL THERAPY SCHOOL _____

COURSES TAKEN RELATED TO ATHLETIC TRAINING:

____ ANATOMY & PHYSIOLOGY ____ CORRECTIVE PHYSIOLOGY

____ ATHLETIC INJURIES ____ BACTERIOLOGY

____ KINESIOLOGY ____ TESTS & MEASUREMENTS

____ FIRST AID ____ HYDROTHERAPY

____ PHYSIOLOGY OF EXERCISE ____ ELECTROTHERAPY

____ HYGIENE

OTHERS: _____

DID YOU WORK AS A STUDENT TRAINER IN HIGH SCHOOL? _____

DID YOU WORK AS A STUDENT TRAINER IN COLLEGE? _____

WHAT ARE THE PROFESSIONAL JOBS YOU HAVE HELD IN THE FIELD?

_____ WHEN? _____

_____ WHEN? _____

_____ WHEN? _____

WHAT CLINICS OR OTHER SCHOOLS FOR ATHLETIC TRAINING DO YOU ATTEND REGULARLY?

TO WHAT PROFESSIONAL ORGANIZATIONS DO YOU BELONG?

HAVE YOU EVER SERVED AS TRAINER FOR AN ALL-STAR TEAM? IF SO, WHICH ONES, AND WHEN DID YOU SERVE?

INFORMATION ON MODALITIES:

WHAT MODALITIES DO YOU HAVE IN YOUR TRAINING ROOM? HOW MANY?

_____ WHIRLPOOL	# _____	_____ SHORT WAVE DIATHERMY	# _____
_____ HOT STEAM PACK UNIT	# _____	_____ VIBRATOR MASSAGER	# _____
_____ ULTRASOUND	# _____	_____ HEAT LAMP	# _____
_____ MUSCLE STIMULATOR	# _____	_____ MICROWAVE DIATHERMY	# _____
_____ COMBINATION ULTRA- SOUND-MUSCLE STIMULATOR	# _____		

OTHERS: _____

WHAT IS THE NAME OF THE MANUFACTURER FOR EACH MODALITY?

WHIRLPOOL _____	SHORT WAVE DIATHERMY _____
HOT STEAM PACK UNIT _____	VIBRATOR MASSAGER _____
ULTRASOUND _____	HEAT LAMP _____
MUSCLE STIMULATOR _____	MICROWAVE DIATHERMY _____
COMBINATION ULTRASOUND- MUSCLE STIMULATOR _____	OTHERS: _____

DO YOU PREFER A PARTICULAR BRAND? _____ WHICH? _____

WHY? _____

WHAT WAS THE APPROXIMATE INITIAL COST OF EACH MODALITY?

WHIRLPOOL _____ SHORT WAVE DIATHERMY _____
 HOT STEAM PACK UNIT _____ VIBRATOR MASSAGER _____
 ULTRASOUND _____ HEAT LAMP _____
 MUSCLE STIMULATOR _____ MICROWAVE DIATHERMY _____
 COMBINATION ULTRASOUND-
 MUSCLE STIMULATOR _____ OTHERS: _____

HOW DID YOU ACQUIRE YOUR KNOWLEDGE OF OPERATION OF EACH MODALITY?

	<u>*OM</u>	<u>TR</u>	<u>CU</u>	<u>GW</u>	<u>ST</u>	<u>Oth</u>
WHIRLPOOL	_____	_____	_____	_____	_____	_____
HOT STEAM PACK UNIT	_____	_____	_____	_____	_____	_____
ULTRASOUND	_____	_____	_____	_____	_____	_____
MUSCLE STIMULATOR	_____	_____	_____	_____	_____	_____
COMBINATION ULTRASOUND- MUSCLE STIMULATOR	_____	_____	_____	_____	_____	_____
SHORT WAVE DIATHERMY	_____	_____	_____	_____	_____	_____
VIBRATOR MASSAGER	_____	_____	_____	_____	_____	_____
HEAT LAMP	_____	_____	_____	_____	_____	_____
MICROWAVE DIATHERMY	_____	_____	_____	_____	_____	_____
OTHER: _____	_____	_____	_____	_____	_____	_____

***KEY TO SYMBOLS:**

OM-Learned by use of operating manuals that come with machine.
 TR-Learned by working under an experienced trainer.
 CU-Learned by continuous use of the machine.
 GW-Learned by guesswork.
 ST-Learned by special training of some kind.
 Oth-Learned by another method; as named.

WHAT FEATURES DO YOU FAVOR IN THIS MODALITY?

Name of Modality	<u>YES</u>	<u>NO</u>	<u>GOOD</u>	<u>FAIR</u>	<u>POOR</u>
1. Economical Purchase	_____	_____	_____	_____	_____
2. Economical Use	_____	_____	_____	_____	_____
3. Safe Operation	_____	_____	_____	_____	_____
4. Reliable Brand Name	_____	_____	_____	_____	_____
5. Adequate Size	_____	_____	_____	_____	_____
6. Easy Operation	_____	_____	_____	_____	_____
7. Easy Cleaning	_____	_____	_____	_____	_____
8. Easy Repair	_____	_____	_____	_____	_____
9. Easy Replacing Parts	_____	_____	_____	_____	_____
10. Construction Materials	_____	_____	_____	_____	_____
11. Durability	_____	_____	_____	_____	_____
12. Versatility	_____	_____	_____	_____	_____
13. Mobility	_____	_____	_____	_____	_____
14. Weight	_____	_____	_____	_____	_____
15. _____	_____	_____	_____	_____	_____
16. _____	_____	_____	_____	_____	_____
17. _____	_____	_____	_____	_____	_____
18. _____	_____	_____	_____	_____	_____
19. _____	_____	_____	_____	_____	_____
20. _____	_____	_____	_____	_____	_____

OTHER COMMENTS: _____

HOW DO YOU USE THIS MODALITY?

Name of Modality	Within 24 Hours	24-48 Hours	After 48 Hours	Conjunc. with oth. Modality	Bef. Ex.	Aft. Ex.	Do Not Use
Thigh Contusion	_____	_____	_____	_____	_____	_____	_____
Other Contusion	_____	_____	_____	_____	_____	_____	_____
Hematoma	_____	_____	_____	_____	_____	_____	_____
Sprain (Ankle)	_____	_____	_____	_____	_____	_____	_____
Sprain (Other)	_____	_____	_____	_____	_____	_____	_____
Knee (Ligament)	_____	_____	_____	_____	_____	_____	_____
Knee (Cartilage)	_____	_____	_____	_____	_____	_____	_____
Bone Bruise	_____	_____	_____	_____	_____	_____	_____
Hyperextension	_____	_____	_____	_____	_____	_____	_____
Fracture	_____	_____	_____	_____	_____	_____	_____
AC Separation	_____	_____	_____	_____	_____	_____	_____
Dislocation	_____	_____	_____	_____	_____	_____	_____
Shin Splints	_____	_____	_____	_____	_____	_____	_____
Muscle Strain	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

OTHER COMMENTS: _____

WHAT PHYSIOLOGICAL RESPONSES ARE YOU ATTEMPTING TO ACCOMPLISH BY THE USE OF THIS MODALITY?

Name of Modality	<u>Deep Heat</u>	<u>Sur-face Heat</u>	<u>Relax Area</u>	<u>Ease Pain</u>	<u>Incr. Circ.</u>	<u>Reduce Swelling</u>
Thigh Contusion	_____	_____	_____	_____	_____	_____
Other Contusion	_____	_____	_____	_____	_____	_____
Hematoma	_____	_____	_____	_____	_____	_____
Sprain (Ankle)	_____	_____	_____	_____	_____	_____
Sprain (Other)	_____	_____	_____	_____	_____	_____
Knee (Ligament)	_____	_____	_____	_____	_____	_____
Knee (Cartilage)	_____	_____	_____	_____	_____	_____
Bone Bruise	_____	_____	_____	_____	_____	_____
Hyperextension	_____	_____	_____	_____	_____	_____
Fracture	_____	_____	_____	_____	_____	_____
AC Separation	_____	_____	_____	_____	_____	_____
Dislocation	_____	_____	_____	_____	_____	_____
Shin Splints	_____	_____	_____	_____	_____	_____
Muscle Strain	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

OTHER COMMENTS: _____

WHAT PHYSIOLOGICAL RESPONSES ARE YOU ATTEMPTING TO ACCOMPLISH BY THE USE OF THIS MODALITY (CONTINUED):

Name of Modality	Reduce	Help	Aid	Other:	Other:	Other:
	<u>Stiff- ness</u>	<u>Break Adhe- sion</u>	<u>Mas- sage</u>	_____	_____	_____
Thigh Contusion	_____	_____	_____	_____	_____	_____
Other Contusion	_____	_____	_____	_____	_____	_____
Hematoma	_____	_____	_____	_____	_____	_____
Sprain (Ankle)	_____	_____	_____	_____	_____	_____
Sprain (Other)	_____	_____	_____	_____	_____	_____
Knee (Ligament)	_____	_____	_____	_____	_____	_____
Knee (Cartilage)	_____	_____	_____	_____	_____	_____
Bone Bruise	_____	_____	_____	_____	_____	_____
Hyperextension	_____	_____	_____	_____	_____	_____
Fracture	_____	_____	_____	_____	_____	_____
AC Separation	_____	_____	_____	_____	_____	_____
Dislocation	_____	_____	_____	_____	_____	_____
Shin Splints	_____	_____	_____	_____	_____	_____
Muscle Strain	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

OTHER COMMENTS: _____

WHAT METHODS DO YOU EMPLOY IN MAINTENANCE OF EACH MODALITY?

Name of Modality

CLEANING FREQUENCY:

Each Day	_____	Once a Month	_____
After Each Use	_____	Once a Year	_____
Once a Week	_____		

CLEANING METHODS:

Wash with soap and water	_____
Use special cleaning agents	_____
Clean with damp cloth	_____
Dust with dry cloth	_____
Disinfect	_____

REPAIRS:

Make repairs yourself	_____
Send machine to factory	_____
Call in specialist	_____
Order parts from manufacturer	_____

GENERAL MAINTENANCE:

	<u>FREQUENT</u>	<u>SELDOM</u>	<u>NEVER</u>
Unplug	_____	_____	_____
Lubricate	_____	_____	_____
Remove, clean parts	_____	_____	_____
Replace parts	_____	_____	_____
Adjust regulatory devices	_____	_____	_____
Check ground wire	_____	_____	_____

BIBLIOGRAPHY

Books

- Aldes, J. H., Indications and Contraindications for Ultrasonic Therapy in Medicine, Publication 3 of Ultrasound in Biology and Medicine, edited by Elizabeth Kelly, Washington, D. C., American Institute of Biological Sciences, 1957.
- Dayton, O. William, Athletic Training and Conditioning, New York, The Ronald Press Co., 1960.
- Dolan, Joseph P., Treatment and Prevention of Athletic Injuries, Danville, Illinois, The Interstate Printers and Publishers, 1955.
- Klafs, Carl E. and Daniel D. Arnheim, Modern Principles of Athletic Training, St. Louis, The C. V. Mosby Co., 1963.
- Morehouse, Laurence E., and Philip J. Rasch, Sports Medicine for Trainers, Philadelphia, W. B. Saunders Company, 1963.
- Thorndike, Augustus, Athletic Injuries-Prevention, Diagnosis and Treatment, Philadelphia, Lea and Febiger, 1956.
- Trickett, Paul C., Prevention and Treatment of Athletic Injuries, New York, Appleton-Century-Crofts, 1965.
- Watkins, Arthur L., A Manual of Electrotherapy, Philadelphia, Lea and Febiger, 1958.

Articles

- Hansen, S., "High Quality-Low Cost Hydrotherapy," Scholastic Coach, XXXVII, (January, 1968), 64.
- Moore, Steve, "Treating and Preventing Pulled Hamstring Muscles," Athletic Journal, XLVIII, (January, 1968), 38.
- Novich, Max M., "Physical Therapy for Athletic Injuries," The Journal of the National Athletic Trainers Association, (Summer 1966), 11-13.

Randall, H. B., "Use of the Whirlpool Bath for Injured Athletes," Journal of School Health, XXXVIII, (November, 1968), 620-1.